

**DRAINAGE
IMPROVEMENT PROJECT
CONCEPTUAL DESIGN
REPORT**



PROJECT SITE:

**SUGAR CREEK WATERSHED
VILLA PARK, DuPAGE COUNTY, ILLINOIS**

PREPARED FOR:

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1 Executive Summary

The Sugar Creek Watershed is located in DuPage County in the Villages of Villa Park and Lombard and the City of Elmhurst. The watershed consists of mostly residential areas with a few areas of commercial, schools, and parks. A majority of the 2,727 acre watershed is drained using storm sewers that discharge into Sugar Creek at multiple locations. Sugar Creek runs through Villa Park as an open channel and also in a closed conduit.

There are a number of areas within the watershed that have a history of flooding. The flooding levels range from minor nuisance ponding to significant flooding that causes structural damage. Although many of the flooding problems within the watershed are located within the floodplain associated with Sugar Creek and its tributaries, this watershed evaluation focuses on the flooding problems located outside the floodplain (localized problem areas). DuPage County is currently working on a detailed evaluation of the Sugar Creek main stem and tributaries and is focusing on flood improvement projects for those Sugar Creek Floodplain areas.

Through a review of available data including survey, 1-foot contour mapping, and utility information, several distinct “Problem Areas” were identified. These problem areas were analyzed to determine the apparent cause(s) of flooding and to develop alternative(s) that reduce the potential for future flooding. “Problem Areas” and locations of structural house flooding are scattered throughout the watershed, suggesting the drainage problems are primarily the result of a poorly defined storm water conveyance system, rather than the result of one or two specific causes.

1.1 Problem Areas and Projects

Four overall “Problem Areas” were identified and several potential flood mitigation projects that were evaluated are described below. The projects described below provide flood reduction options ranging from eliminating all residential home flooding to eliminating some residential home flooding. Additionally, the projects are expected to shorten the duration of flooding and provide a positive means for water to leave the problem areas after inundation peaks have subsided. As shown in Figure 1.1.A, each of the Problem Areas are located north of Sugar Creek.

Once the proposed alternatives were analyzed for each Problem Area, it was confirmed that there was no impact to the flow or elevation in Sugar Creek by comparing the flow and elevation at two locations within the creek. These comparisons can be found in Appendix D of this report.



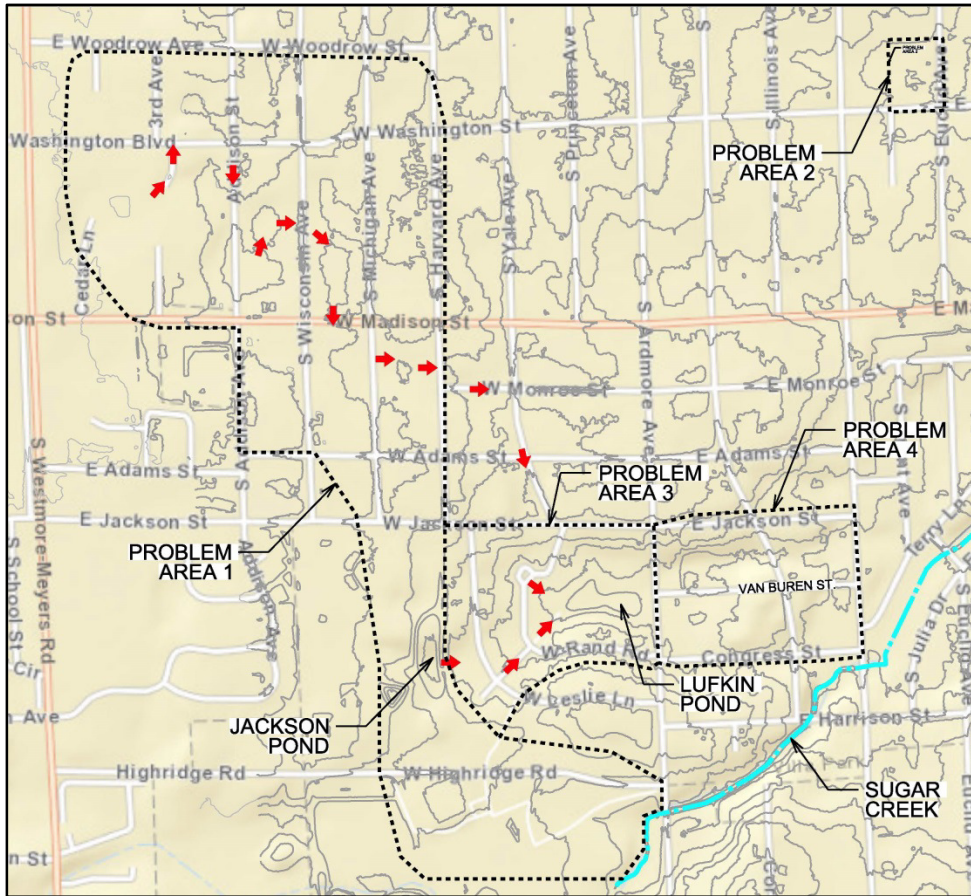


Figure 1.1.A – Overall Problem Area Locations

Problem Area 1 encompasses the northwest portion of the Sugar Creek Watershed (Addison and Madison area) (see Exhibit XI) within Villa Park where a majority of the reported flooding issues were identified. Based upon a review of available data, there are a number of low points that have outlets with limited capacity or no outlet at all. Alternatives to improve drainage in this problem area include increasing the inlet capacity at the low points, construction of a relief sewer, and the addition of downstream flood storage. Additionally, an alternative was evaluated with similar utility improvements, but included a group of home buyouts in two locations within the neighborhoods to provide the required storage instead of providing storage at the school locations.

Problem Area 2 is located at the intersection of Washington and Euclid. A low point was identified that is drained by an undersized storm sewer that ultimately connects to a combined sewer system, and flooding occurs frequently. Several alternatives were evaluated for this area but increasing capacity of the sewer had a limited benefit due to downstream constraints and it generally is not desirable to increase stormwater flow to a combined sewer system. The proposed improvement having the greatest benefit was lowering the overflow point in the side yards so storm water can escape the low area at a lower elevation to reduce the high water elevation adjacent to the homes.

Problem Area 3 is located along Rand Road, specifically between its intersection with Madison Street and Willow Crest Drive. A 36-acre area north of Jackson between



Harvard Avenue and Ardmore Avenue is tributary to a 24-inch storm sewer within Ardmore Avenue that connects to the 48-inch storm sewer at the outlet from Lufkin Pond. Any storm water runoff that cannot be conveyed by the existing storm sewer system flows overland to Yale Street and south to Jackson. In large storm events, a majority of this flow will “jump” the crown of the roadway (Jackson) and flow south down Rand Road. This large amount of overland bypass flow contributes to the flooding of several homes within this problem area. Specifically, the house at 1027 Rand Road has a depressed garage that has historically flooded during large storm events.

Proposed alternatives considered for this Problem Area include raising the Rand Road roadway profile to re-route the overland bypass flow east along Jackson, constructing a relief sewer from Rand Road to Lufkin Pond, and a potential buyout of 1027 Rand Road with the construction of an overflow swale in its place.

Problem Area 4 includes the low areas in the backyards north and south of Van Buren Street. Both of these areas are drained by storm sewers, but they cannot convey the tributary runoff, which results in significant ponding in both areas. The proposed alternative for Problem Area 4 is to construct a relief sewer from the low area north of Van Buren Street to Sugar Creek. The flooding that occurs south of Van Buren Street is directly influenced by the tailwater elevation caused by Sugar Creek at the storm sewer’s discharge location (Cross Street).

1.2 Recommendations

Problem Area 1

V3’s recommendation for Problem Area 1 is Proposed Alternative 1c (see Figure 1.2.A below or Exhibit EX3 in Exhibits section for more detail), which is to construct a 72-inch relief sewer (or sewer with equivalent capacity) along with storm sewer connections to backyard flooding areas from the intersection of Madison and Addison, south along Michigan and into an expanded storage basin (Jackson Pond) located at the Jackson Middle School.

This alternative also includes the construction of an overflow swale from Jackson Pond south and east to an additional storage area on Willowbrook High School property immediately adjacent to Sugar Creek. Additional details about this alternative can be found under section 6.1: Problem Area 1. The conceptual probable construction cost for this alternative is approximately \$6.7M.

For the 100-year, 2-hour storm, the improvements associated with this alternative result in 79 houses being removed from damage (modeled water elevation above the low opening of the house) out of 83 houses with damage in the existing conditions model.



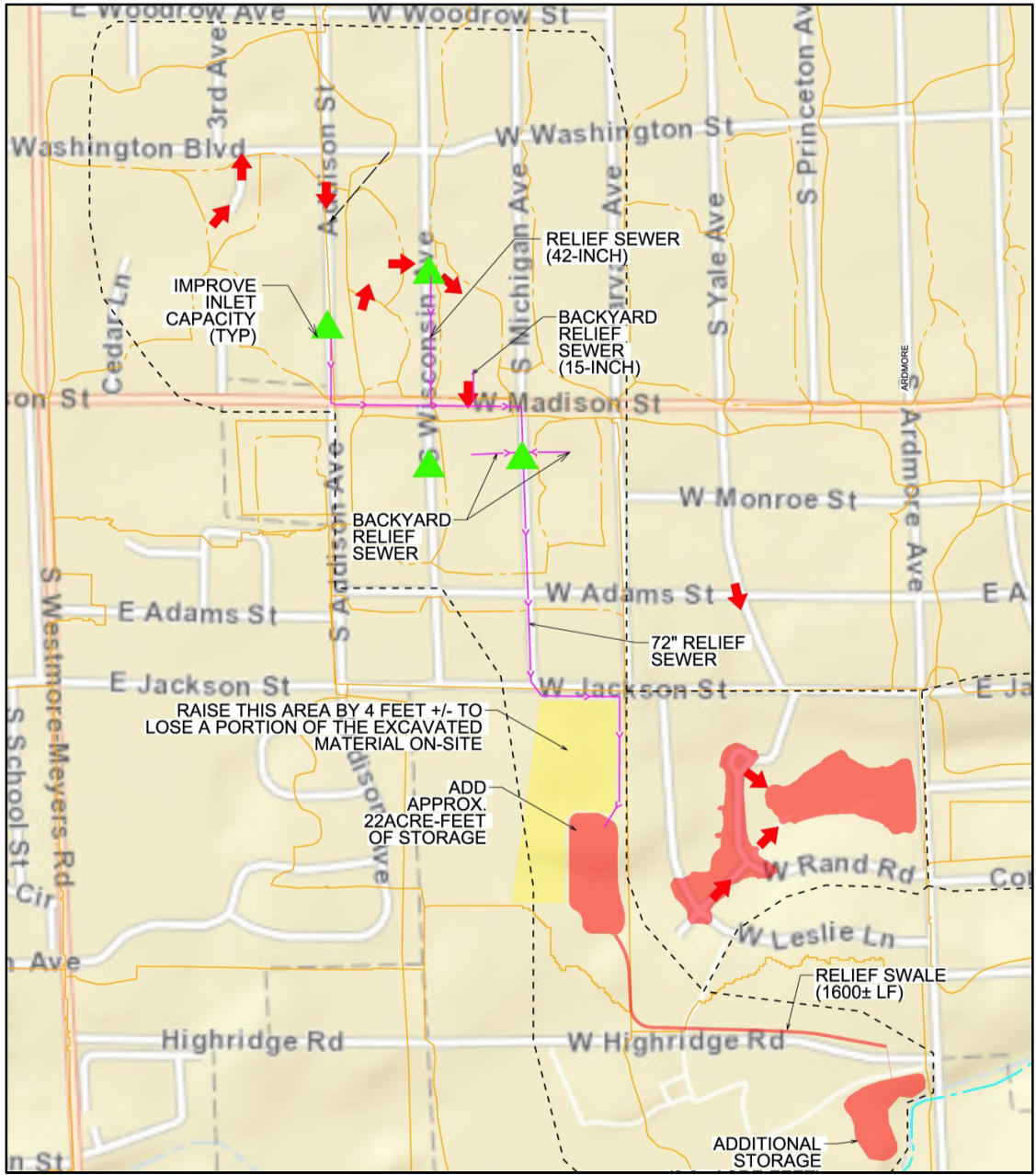


Figure 1.2.A – Proposed Improvements for Proposed Alternative 1c



Problem Area 2

Problem Area 2 was also evaluated by Christopher B. Burke Engineering. After coordination with the Village, it was decided that this problem area will be addressed by the proposed improvements presented in their study.

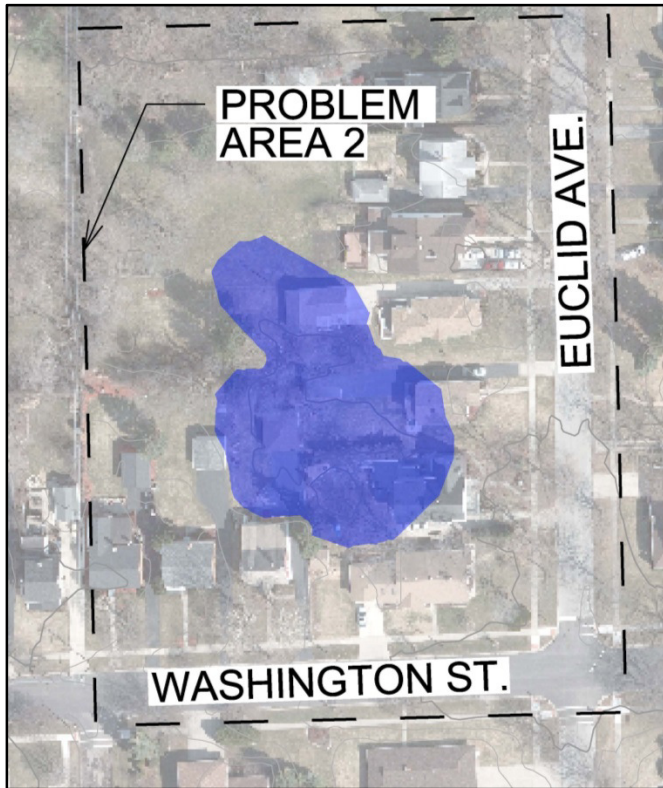


Figure 1.2.B – Problem Area 2 Location



Problem Area 3

V3's recommendation for Problem Area 3 is Proposed Alternative 3b (See Exhibit EX7). This alternative involves adding additional inlets and storm sewer along Rand Road to collect a majority of the overland runoff and conveying the discharge to Lufkin Pond through a 48-inch pipe. The pipe would likely run between 1021 and 1027 Rand Road or between 1027 and 1033 Rand Road. Inlet spacing and sizing would be improved to capture the flow in the roadway during the design storm event. It also includes increasing the storage capacity at Lufkin Pond by approximately 4-acre feet. Additional details about this alternative can be found under section 6.3: Problem Area 3. The probable construction cost for this alternative is approximately \$665,000.

For the 100-year, 2-hour storm, the improvements associated with this alternative result in nine houses being removed from damage (modeled water elevation above the low opening of the house) out of nine houses with damage in the existing conditions model.

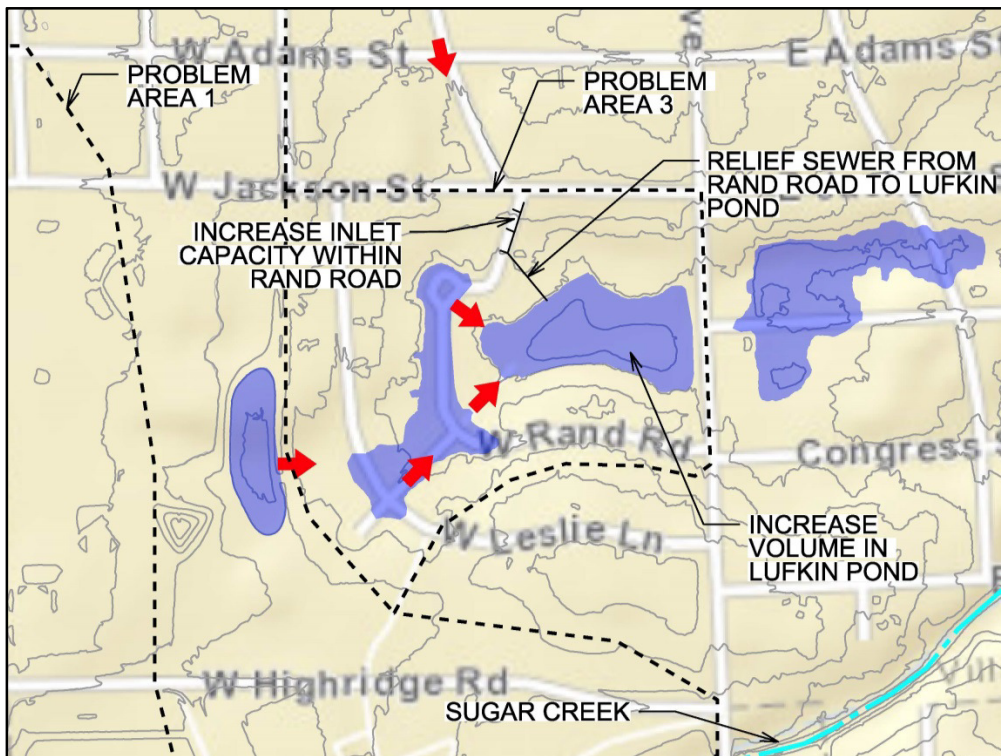


Figure 1.2.C – Proposed Improvements for Proposed Alternative 3b



Problem Area 4

V3's recommendation for Problem Area 4 is Proposed Alternative 4a (See Exhibit EX9). This alternative includes the construction of a 66-inch relief sewer (or sewer of equivalent capacity) from the low area north of Van Buren into Sugar Creek at Cross Street.

The area south of Van Buren is drained by a 48-inch storm sewer that discharges at Summit Avenue. The tailwater from Sugar Creek at Summit is significantly higher than Cross Street, so there is little potential to significantly improve the high water elevation south of Van Buren. Additional details about this alternative can be found under section 6.4: Problem Area 4.

The probable construction cost for this alternative is approximately \$1.9M.

For the 100-year, 2-hour storm, the improvements associated with this alternative result in six houses being removed from damage (modeled water elevation above the low opening of the house) out of eight houses with damage in the existing conditions model. The two houses that continue to show damage are located south of VanBuren Street.

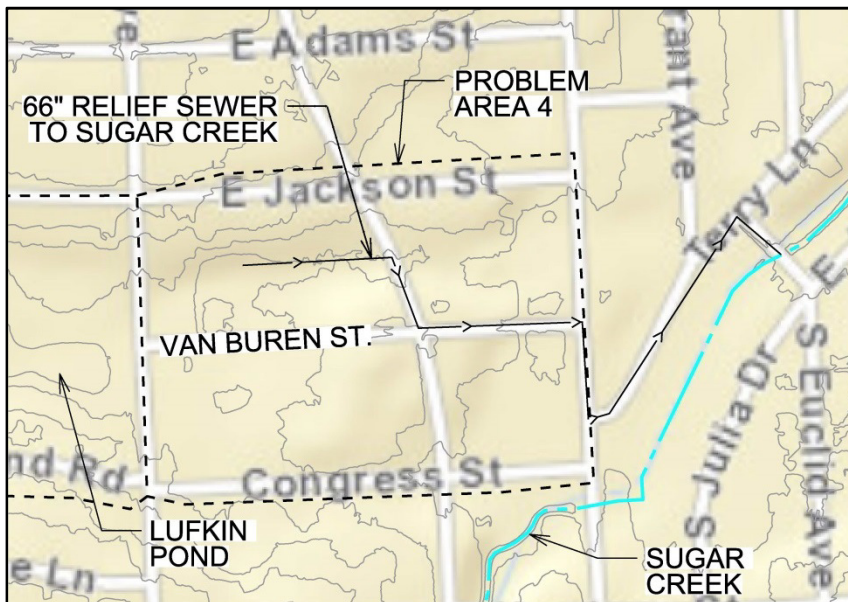


Figure 1.2.D – Proposed Improvements for Proposed Alternative 4a



2 Sugar Creek Watershed Overview

The Sugar Creek watershed is located in DuPage County in the Villages of Villa Park, Elmhurst, and Lombard. This study is for the Village of Village Park and will only focus on the Sugar Creek Watershed within the Village limits. The overall watershed is approximately 2,727 acres (1,004 acres within Villa Park) and ultimately discharges into Salt Creek on the west side of Route 83 south of Monroe Street. A majority of the watershed is residential or commercial with a small portion of open space with parks, schools, or golf courses. There is limited detention provided within the watershed, especially in the dense residential areas.

A majority of the storm water runoff in the watershed is collected and routed to Sugar Creek via storm sewers. The remaining areas adjacent to the creek are conveyed using swales or overland flow.

Sugar Creek enters Villa Park on the west just south of Norton Street, runs through Willowbrook High School and heads to the north and east where it discharges into Salt Creek just east of Route 83 and south of Monroe Street. The Federal Emergency Management Agency (FEMA) shows Sugar Creek as Zone AE floodplain with floodway on the Flood Insurance Rate Map (FIRM) (Exhibit VI) through the village adjacent to the creek. Problem Areas 1 through 4 are upstream of the mapped floodplain and are considered to be local flooding.

Location maps with various base map conditions are provided within the “Exhibits” section of this report.

3 Background / Site History

Flooding is experienced by Villa Park residents due to a combination of factors including undersized drainage infrastructure, low points with undersized or underperforming outlet sewers, and a lack of natural or constructed flood storage. The last major storm event in April 2013 caused significant flooding within the watershed and was a motivating factor for this evaluation.

The purpose of this report is to identify locations of “problem areas,” present an analysis of the apparent causes of drainage problems, and identify proposed alternative(s) to reduce potential for future flooding within “off-line” residential areas of the Sugar Creek Watershed. As mentioned in the Executive Summary, this report focuses on the areas outside the known floodplain since DuPage County is currently analyzing Sugar Creek and its tributaries.

4 Data Collection

Several documents and associated data were collected to aide in the evaluation and remedial analysis of the potential Villa Park flood problem areas:

4.1 Topographic Information (1-ft Contours with LIDAR Points)

Villa Park provided the Topographic Information that included 1-foot contours and LIDAR points in GIS format. This data encompassed the entire Village and was used to



determine approximate existing depressed areas, overflow routes, and damage elevations.

V3 supplemented this information with an additional survey of low openings of houses within problem areas and of critical overflow paths.

4.2 2-foot Topographic Mapping

In addition to the one-foot contours provided by the Village, two-foot contours obtained from DuPage County were used for determining watershed boundaries that encompassed portions of Villa Park and Lombard.

4.3 Aerial Photos

Aerial photos were provided by Villa Park (taken in 2014) and were used in the land use evaluation and hydraulic analyses.

4.4 Floodplain Mapping and Modeling

The regulatory Flood Insurance Rate Map (FIRM) was obtained from the Federal Emergency Management Agency (FEMA). This map depicts the approximate limits of the regulatory 1% annual chance floodplain.

4.5 Engineering Reports/Calculations and Utility Information

Several reports have previously been prepared for the Sugar Creek Watershed that were reviewed and incorporated as appropriate in our modeling analyses. In addition to the reports, Villa Park provided utility information for the watershed. The following documents were provided:

- Sugar Creek Watershed Hydrology Study – prepared by Manhard Consulting, June 2013

This report was obtained from the Village of Villa Park and encompasses the entire Sugar Creek watershed. The purpose of this report was to assess the peak flows within Sugar Creek and its tributaries from its headwaters to its confluence with Salt Creek.

As a part of the Sugar Creek Watershed Hydrology Study, an EPA SWMM5 model was prepared to evaluate the flooding associated with Sugar Creek, but did not address local flooding within the watershed upstream of the floodplain. This model was used as a starting point for our detailed study of specific problem areas identified in coordination with the Village. V3 converted the EPA SWMM5 model to XP-SWMM, truncated it to the Villa Park extents and updated the truncated XP-SWMM model with more detailed information to better understand the localized existing conditions (herein after referred to as VP XP-SWMM model).

Since the VP XP-SWMM model also encompasses portions of the Sugar Creek Watershed located outside Village limits, V3 created input hydrographs for various storm events to represent the flow coming from those areas.



- Evaluation of Village of Lombard's Proposed Kelly Court Storm Sewer Improvements

In 2011, V3 prepared a memorandum for the Village of Villa Park regarding the Kelly Court storm sewer improvements that are located at the northwest corner of the Sugar Creek Watershed in Villa Park. This memorandum looked at the drainage characteristics of this specific area and has been incorporated into our modeling and analyses.

- Villa Park Utility Atlas

The Village provided V3 with pdf versions of their most recent utility atlases.

- Storm Sewer Information provided by RJN

RJN provided V3 with rims, measure down information, and pipe sizes for a portion of the storm sewer within the Sugar Creek Watershed relative to this project. This information was incorporated into the VP XP-SWMM model to better define the storm sewer network.

4.6 Field visits

Field visits were conducted in fall 2014 to gain a better understanding of the drainage patterns and apparent problems in the project areas.

5 Study Methodology

5.1 Problem Area Identification

After reviewing all of the collected documents and discussing the previous drainage problem areas with the Village, specific problem locations were grouped together into "Problem Areas." Three main sources of information were used to determine locations of apparent problems and group them together into "Problem Areas:"

- Results of discussions with the Village and flooding reports from previous storm events (most recently the April 2013 event);
- Results of the hydraulic model of the Sugar Creek Watershed;
- Review of previous reports for the watershed.

Individual problems were noted on a map. "Problem Areas" were defined by grouping several individual problem locations together based on geographic proximity and similar apparent problem causes. Some "Problem Areas" overlap, especially if multiple sources of flooding were identified within the same geographic area.

These problem areas were then evaluated to determine the apparent cause(s) that contribute to drainage problems.



5.2 Evaluation of Problem Areas and Proposed Alternatives

Various qualitative and quantitative tools were used to evaluate identified Problem Areas. Calculations were performed to determine the existing apparent cause(s) of problems. The calculations were then refined or revised to reflect various proposed alternatives and determination of the results expected from the alternatives. A description of the calculation methodology, including the storm water models used for the analyses, and a description of the input data and assumptions can be found in Appendix A.

The main tool for evaluating the problem areas was the VP XP-SWMM model. As mentioned above, this model was created using the Manhard SWMM5 model as a base, truncating it to the Villa Park boundary, and then building more detail into it for specific problem locations. The model was calibrated using rainfall data from the April 2013 storm and comparing it to observed conditions from that event. It should be noted that the model indicated Lufkin Pond overtopping at Ardmore in various modeled storm events including the April 2013 event, but this condition has not been observed by the Village. Because no reported overtopping occurred, but the reported Lufkin Pond high water elevation was close to the computed high water elevation, V3 concluded that the VP XP-SWMM model representation was accurate for purposes of analyzing alternatives to reduce the flooding experienced by the residents of Villa Park in the project area.

Villa Park will be reconstructing the storm sewer within Michigan Avenue between Park Avenue and Madison Street this year. Since this work will be performed, it was added to the existing VP XP-SWMM model to establish a baseline model. This baseline model was used as a comparison for all proposed alternatives.

Based on this evaluation, the proposed model scenarios were then built using the Baseline VP XP-SWMM as a base.

For each alternative evaluated, V3 confirmed that the flows and elevations in Sugar Creek were not impacted due to the improvements by comparing these parameters at two locations; one upstream of the discharge of our improvements and one downstream of our improvements. Proposed Alternative 4a was the only solution that showed an impact to Sugar Creek because there was no available space to compensate for the storage that was being removed from the flooded areas. This alternative will need to be re-evaluated once DuPage County has completed their study of Sugar Creek at its associated floodplain.

Additionally, each alternative was evaluated independently and was modeled according to present-day conditions. It should be noted that improvements made in one area could reduce overflow and tributary runoff in other areas, potentially altering current conditions and requiring further analysis.

5.3 Cost Estimates and Permitting Requirements

After potential alternatives were identified, a conceptual engineering plan was created for each alternative and a corresponding Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. Detailed EOPCC's for each alternative can be found in Appendix B. The anticipated permitting requirements for each alternative were also identified.



5.4 Recommended Projects

After evaluating proposed alternatives, recommendations were developed. Recommended projects included those that will reduce drainage problems in Problem Areas experiencing the most severe flooding. Projects were also prioritized in the Recommendations List based on the expected cost versus the benefit for the Problem Area. These priority projects are recommended for implementation, but may be adjusted and changed as necessary based on feedback from the Village, residents, and other stakeholders as well as any changes to current drainage conditions.



6 Problem Areas

6.1 Problem Area 1: Madison Avenue West – between Addison and Harvard

Upon review of the topographic survey and field visits, and after discussion with Villa Park, it became apparent that an area with significant drainage concerns is located in the region north and south of Madison Avenue between Addison and Harvard. There are several low areas within the roadways and also within backyards that either have an insufficient drainage system for a significant rainfall event or no drainage system at all. In addition to the low areas, there is an overflow route between Jackson Pond (located in the open space at Jackson Middle School) and Lufkin Pond (located in Lufkin Park).

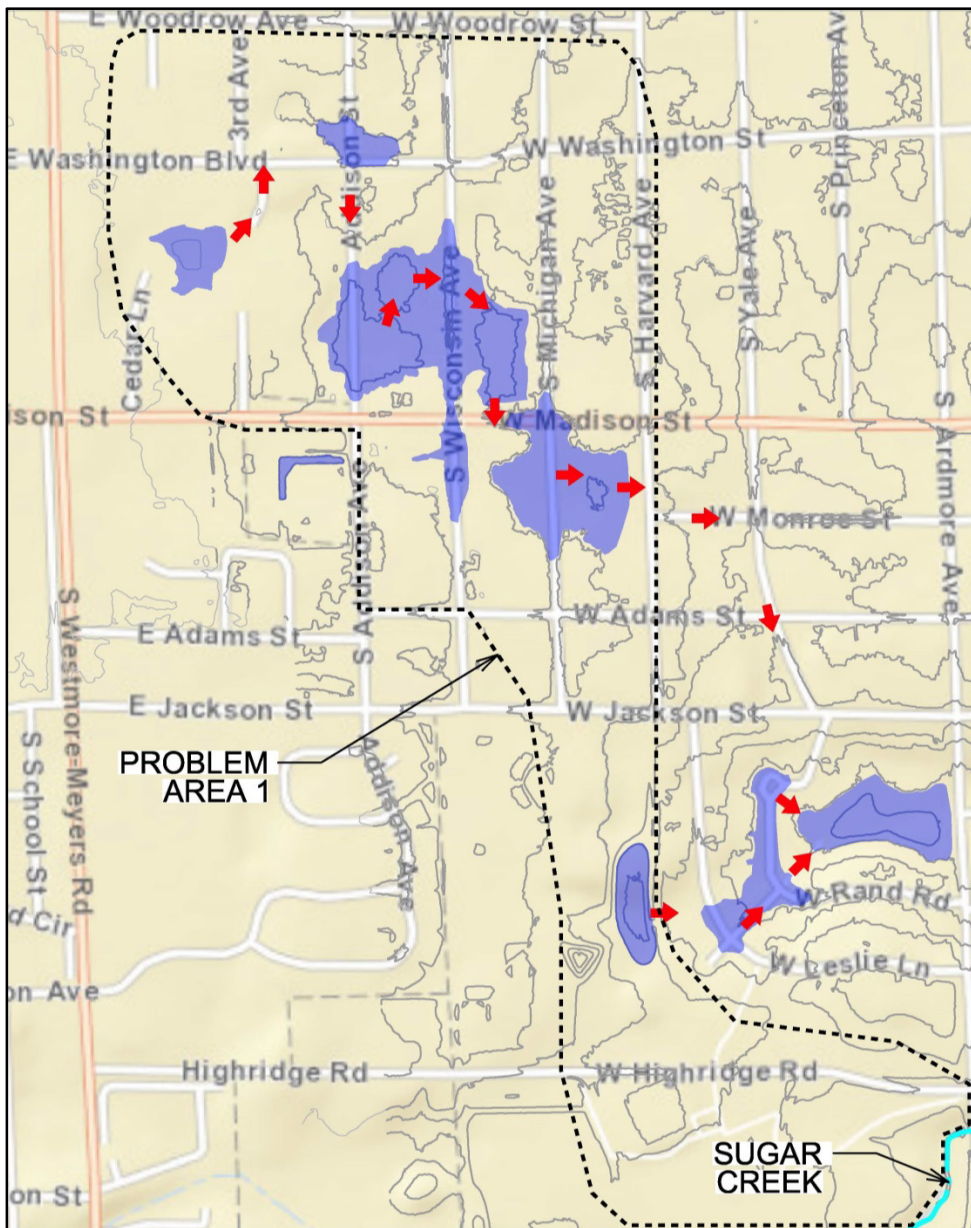


Figure 6.1.A – Problem Area 1 Location



When Jackson Pond overflows its banks, it runs between two homes on Leslie Lane, down Willow Crest Drive, across Rand Road and through a concrete swale between two homes into Lufkin Pond, contributing to issues within Problem Area 3 (see section 6.3).

There are several areas within this corridor that have depressional flooding, including the following specific problem locations. These specific problem locations correlate to areas with identified flooding problems.

- Problem Area 1.1: Low Point on Addison, north of Madison
- Problem Area 1.2: Low Point on Addison, north of Washington
- Problem Area 1.3: Low Point between Addison and Wisconsin, north of Madison
- Problem Area 1.4: Low Point on Wisconsin, north of Madison
- Problem Area 1.5: Low Point between Wisconsin and Michigan, north of Madison
- Problem Area 1.6: Low Point on Wisconsin, south of Madison
- Problem Area 1.7: Low Point on Michigan, south of Madison
- Problem Area 1.8: Low Point between Michigan and Harvard, south of Madison
- Problem Area 1.9: Overflow path between Jackson Pond and Lufkin Pond

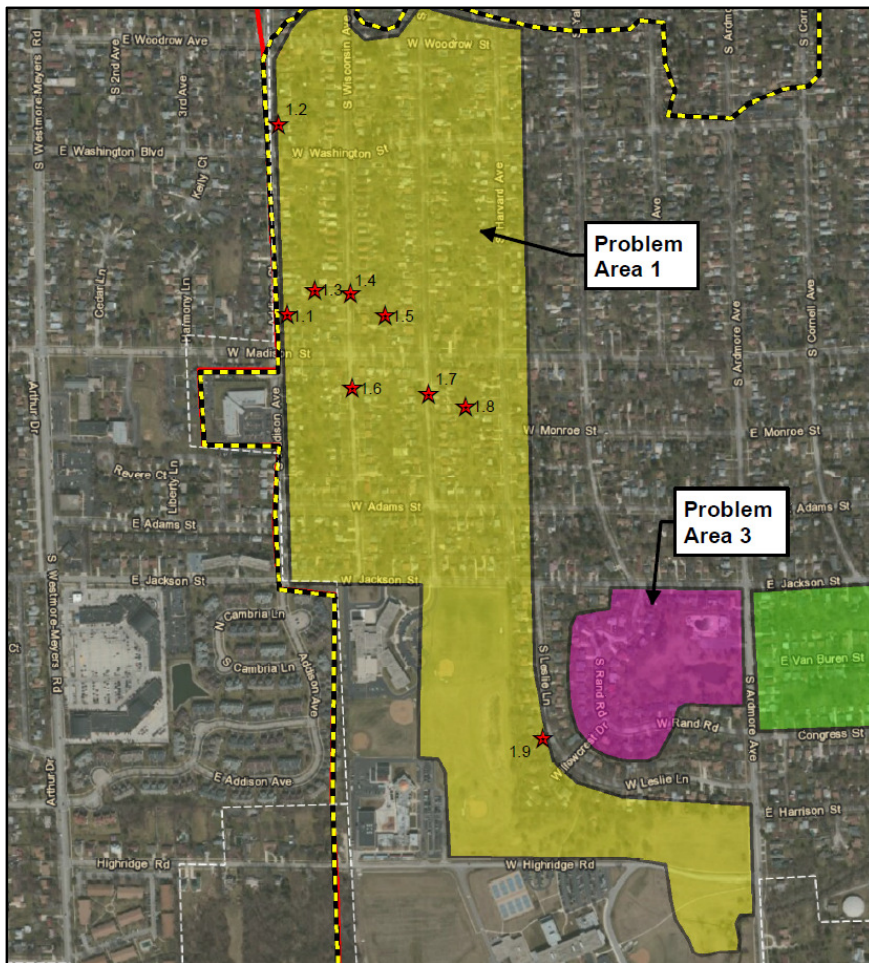


Figure 6.1.B – Specific Problem Area 1 Locations



6.1.1 Baseline Condition Analysis

The expected flooding depths were computed for a range of storm frequencies (such as the 10-year, 50-year and 100-year storm events). It was determined that the 2-hour storm was the critical duration event, so the 2-hour and 24-hour events were computed for each storm frequency. A summary of results at specific problem locations presented below in Table 6.1.1.

The damage elevations listed in the table are the low opening elevations for the houses adjacent to low areas and are taken from the survey information where available or are estimated from the LIDAR ground elevations provided by Villa Park. Low opening elevations were not approximated for garages, storage sheds or other ancillary structures.

Appendix E shows potential damage elevations for each house located in or adjacent to an identified problem area. Low openings are provided for each structure and top of foundation and finished floor elevations are included in this table if available from the survey. In the Baseline Conditions, 83 structures were identified with damage (water level above Low Opening) in Problem Area 1. Four of these structures that show damage are located at the intersection of Washington and Addison. Per the Village's instruction, V3 did not propose any solutions to reduce flooding at this intersection because the flooding issues within the Washington Street corridor are being evaluated separately as part of a green infrastructure grant provided by the County.



Table 6.1.1: Summary of High Water Elevations in Problem Area 1 (Baseline)

Node Information		Node Information		10-year, 2-hour (Baseline)	10-year, 24-hour (Baseline)	50-year, 2-hour (Baseline)	50-year, 24-hour (Baseline)	100-year, 2-hour (Baseline)	100-year, 24-hour (Baseline)
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.56	705.17	707.27	706.98	707.53	707.21
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.56	705.17	707.27	706.98	707.53	707.21
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.56	705.75	707.25	706.98	707.51	707.20
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	704.73	704.56	704.79	704.97	705.13	704.89
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.17	706.73	707.21	707.05	707.32	707.08
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	703.70	702.70	704.48	703.50	704.74	703.78
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	702.19	701.71	703.70	703.27	704.14	703.58
JMS-Pond	Jackson Middle School Pond*	682.20	689.60	689.17	687.53	690.22	689.59	690.43	690.05
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	670.52	674.25	672.21	674.55	672.98

*Damage elevations for the Jackson Middle School Pond and the Lufkin Park Basin are actually the overtopping elevations.

XX Elevation above potential damage elevation for houses



As indicated on Table 6.1.1, most of these locations show potential damage greater than one foot even in a 10-year event. The flooding can be attributed to several factors:

- Limited inlet capacity
- Undersized storm sewer
- No inlet or storm sewer to backyard depressional areas

6.1.2 Proposed Condition Analysis

Projects proposed for Problem Area 1 include:

- Alternative 1a: Increase Inlet Capacity at Problem Area 1.2
- Alternative 1b: Add a relief sewer from Problem Area 1.2 to Jackson Pond and increase the storage volume of Jackson Pond.
- Alternative 1c: Alternative 1b plus add a swale south to a proposed pond at Willowbrook High School with a direct discharge into Salt Creek, increase inlet capacity at various locations, and add storm sewer connections to all backyard depressional areas
- Alternative 1d: Home buyouts in two locations for detention and storm sewer improvements. No work on school district property.

As described above, Alternatives 1a, 1b, and 1c each build off one another. The EOPCCs, however, are independent from one another and can stand alone. For example, the EOPCC for Alternative 1c includes all of the improvements from 1b and 1a as well as the additional improvements for 1c.

Alternative 1d is independent from the other three alternatives for Problem Area 1.



6.1.2.1 Proposed Alternative 1a
 Increase Inlet Capacity at Problem Area 1.2

Proposed Alternative 1a involves increasing the inlet capacity at the low point on Addison, just north of Madison where there has been significant flooding and damages during previous large storm events. There are currently 4 inlets positioned at the low point that were established to have an approximate inlet capacity of 4 cfs. The proposed improvement is to replace these inlets with high capacity inlets and potentially add inlet structures as necessary.

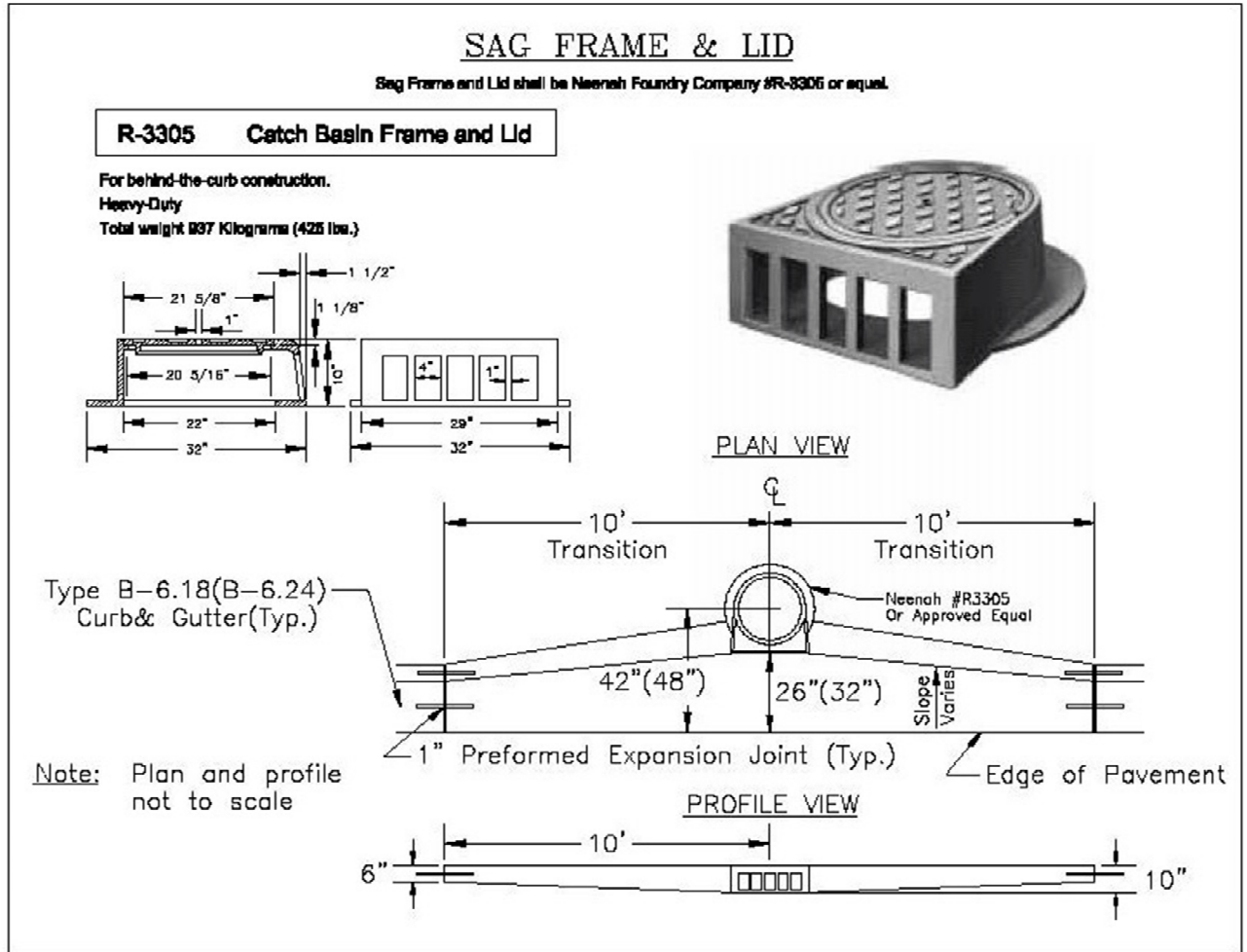


Figure 6.1.2.1 – DuPage County Sag Frame and Lid Detail (Example)

To evaluate this alternative, XPSWMM model p1a evaluated the benefit achieved by only increasing the inlet capacity at the low point on Addison just north of Madison. It was assumed that an inlet system could be designed to accept and directly convey all the flows that are tributary to these inlets. The same storm events were run as in the baseline conditions to provide a comparison view to show the benefits of these improvements.

Results are summarized below in Table 6.1.2.1.



Table 6.1.2.1 – Summary of Peak Elevations at Locations in Problem Area 1 with Proposed Alternative 1a

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (P1a)	Baseline Peak Elevation	Proposed Peak Elevation (P1a)	Baseline Peak Elevation	Proposed Peak Elevation (P1a)	Baseline Peak Elevation	Proposed Peak Elevation (P1a)
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.56	706.59	705.17	705.17	707.53	707.47	707.21	707.21
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.56	706.59	705.17	705.17	707.53	707.47	707.21	707.21
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.56	706.59	705.75	705.75	707.51	707.46	707.20	707.20
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	704.73	704.72	704.56	704.53	705.13	705.11	704.89	704.84
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.17	707.17	706.73	706.73	707.32	707.30	707.08	707.08
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	703.70	703.70	702.70	702.71	704.74	704.75	703.78	703.78
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	702.19	702.19	701.71	701.71	704.14	704.11	703.58	703.58
JMS-Pond	Jackson Middle School Pond*	682.20	689.60	689.17	689.17	687.53	687.53	690.43	690.43	690.05	690.05
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	673.06	670.52	670.52	674.55	674.55	672.98	672.97

*Damage elevations for the Jackson Middle School Pond and the Lufkin Park Basin are actually the overtopping elevation

XX Elevation above potential damage elevation for houses



As indicated in Table 6.1.2.1, simply increasing the inlet capacity at one specific location has only a minor benefit on reducing the flooding, but not significant enough to remove the adjacent structures from experiencing potential damage. This solution gets more of the water into the storm sewer system, but the resulting elevations indicate that the storm sewer is not sufficiently sized to handle these flows. This indicates a need for either a relief sewer or increased storm sewer size to increase discharge capacity.

Based on the results, one house was removed from damage based on these improvements.

Engineer's Opinion of Probable Cost

An Engineer's Probable Opinion of Probable Construction Cost (EOPCC) was prepared and the cost of the Inlet Capacity Improvements was computed at \$31,000.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below.

- It is understood that the improvements are local and that a permit for the additional inlets would be issued directly by the Village.



6.1.2.2 Proposed Alternative 1b
Relief sewer from Problem Area 1 to Jackson Pond

Proposed Alternative 1b builds off of Alternative 1a in that it assumes the improvements associated with Alt 1a are included. Alternative 1b involves constructing a 54-inch relief sewer from Problem Area 1.2 and carries the flow east on Madison, south on Michigan, and then across Jackson Avenue to its ultimate discharge into the Jackson Pond (the basin within the open space east of Jackson Middle School). This alternative also includes expanding this basin to increase in size from 6.6 acre-ft to approximately 28.5 acre-ft (see Figure 6.1.2.2.B).

It has been established that the existing storm sewer is undersized and is a root cause of the flooding problems in Problem Area 1. The purpose of this relief sewer is to provide additional conveyance so the storm water runoff is conveyed from the area before ponding to the damage elevations currently experienced can occur.

The relief sewer is proposed to run east down Madison Avenue for two blocks and then south of Michigan. Michigan Avenue was chosen because it is also in need of roadway reconstruction which may be planned in the relatively near future. Adding a 54-inch relief sewer underneath any existing roadway will require major pavement reconstruction so choosing a roadway that already is in need of reconstruction is more cost-effective all other things being equal.

Table 6.1.2.2 on the following page shows the existing and proposed peak elevations that would result from Proposed Alternative 1b.

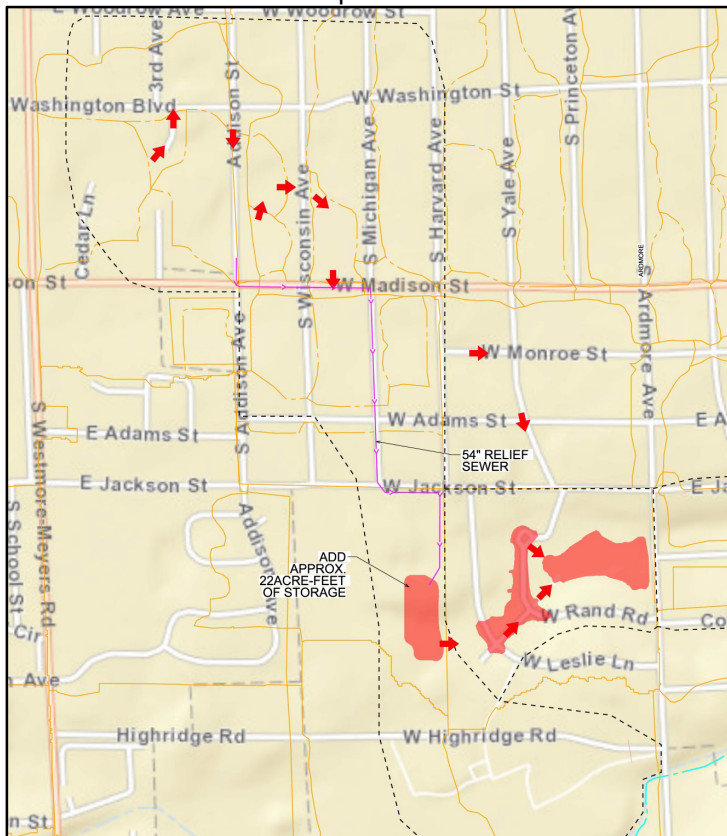


Figure 6.1.2.2.A – Proposed Improvements for Proposed Alternative 1b



Table 6.1.2.2 - Summary of Peak Elevations at Locations in Problem Area 1 with Proposed Alternative 1b

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (P1b)	Baseline Peak Elevation	Proposed Peak Elevation (P1b)	Baseline Peak Elevation	Proposed Peak Elevation (P1b)	Baseline Peak Elevation	Proposed Peak Elevation (P1b)
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.56	700.43	705.17	698.36	707.53	704.61	707.21	699.04
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.56	703.93	705.17	704.54	707.53	705.25	707.21	705.05
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.56	704.11	705.75	704.10	707.51	706.41	707.20	705.87
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	704.73	704.19	704.56	704.52	705.13	704.78	704.89	704.72
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.17	707.17	706.73	706.73	707.32	707.26	707.08	707.08
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	703.70	703.39	702.70	701.50	704.74	704.29	703.78	703.02
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	702.19	701.62	701.71	701.71	704.14	703.05	703.58	702.18
JMS-Pond	Jackson Middle School Pond*	682.20	689.80	689.17	686.07	687.53	689.06	690.43	690.39	690.05	690.80
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	672.95	670.52	670.15	674.55	674.52	672.98	673.99

*Damage elevations for the Jackson Middle School Pond and the Lufkin Park Basin are actually the overtopping elevations

XX Elevation above potential damage elevation for houses

The results show that although this proposed alternative helps get water off of the pavement at a few key low points within the roads, it provides a limited benefit for the depressional storage areas in several backyards along Michigan Ave. In addition, although Jackson Pond has been expanded by approximately 22 acre-feet, it still overtops and runs between two homes on Leslie Lane, down Will Crest Drive, across Rand Road, and through another overflow between two homes and into Lufkin Pond. In fact, high water elevations in Jackson Pond actually increases somewhat from existing conditions since more water is being sent to the pond than in existing conditions. More volume is being removed from the ponding than is being introduced in Jackson Pond.

In this alternative, Jackson Pond continues to overflow towards Lufkin Pond and may require additional improvements involving grading or lowering of overflow points to convey the flow without damaging any additional structures within this conveyance path. Such improvements are not included in the EOPCC for this alternative.

As seen in Appendix E, Proposed Alternative 1b prevents 33 homes from being damaged in the 100-year, 2-hour storm event. However, 50 homes still show damage with these proposed improvements, so Proposed Alternative 1c was evaluated to remove all homes from flood damage in the 100-year storm event.

Proposed Alternative 1b should help reduce high water elevations in a few of the major roadway flooded areas (specifically Madison Avenue and Addison Avenue), but would not significantly reduce the number of homes that show damage caused by flooding in depressed backyard areas. It also does not address the problem of overflow from Jackson Pond to Lufkin Pond. Also, as seen in Appendix D, Alternative 1b results in a 1% increased flow in Sugar Creek. If this alternative is chosen, this can be reduced in the final design.

Engineer's Opinion of Probable Construction Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is computed at \$4.3M.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits would be issued directly by the Village.
- A notice of intent must be submitted to the Illinois Environmental Protection Agency for compliance with ILR10, water quality from runoff from construction sites.
- Permits or approvals from FEMA are not anticipated.



6.1.2.3 Proposed Alternative 1c:

Proposed Alternative 1b, add a swale to Proposed South Basin, increase inlet capacity, and install storm sewer to pick up backyards.

Proposed Alternative 1b showed that the relief sewer will significantly reduce roadway flooding within Problem Area 1, but was only able to prevent the damage to 33 structures. This alternative includes all the improvements included in Alternative 1b and adds a swale from Jackson Pond which drains south to a proposed basin to be located in the open space at the southwest corner of Ardmore Avenue and Highridge Road on Willowbrook High School's property, increases inlet capacity at multiple low points within the problem area, and adds storm sewer to convey flow from several backyard low areas.

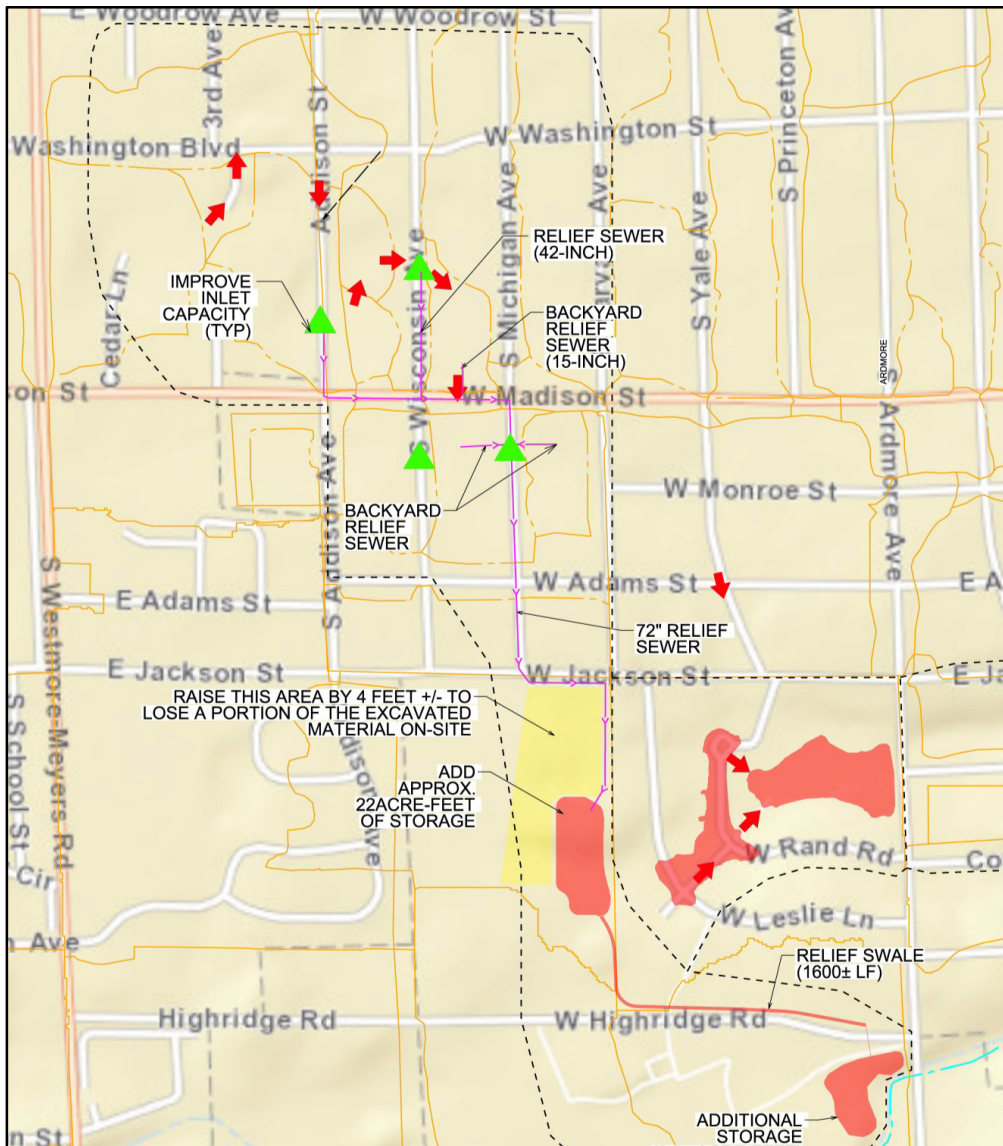


Figure 6.1.2.3 – Proposed Improvements for Proposed Alternative 1c



The intent of this alternative is to eliminate damage from all of the identified houses and keep flooding in the street below 1-foot to allow for the passage of emergency vehicles.

The proposed swale between Jackson Pond and the proposed pond at Willowbrook High School will be designed to carry overflow from Jackson Pond to the south before storm water in Jackson Pond has a chance to overtop and flow east through the homes and into Lufkin Pond. Instead, it will flow south through the open space in Willowbrook Park approximately 435 linear feet, then flow east approximately 1200 feet, and then south through a culvert underneath Highridge Road and into the proposed basin. The proposed basin will discharge directly into Sugar Creek upstream of the culvert that runs underneath Ardmore Avenue.

In addition to the swale and proposed storage downstream, this alternative also includes increasing inlet capacity at a number of low areas within Problem Area 1 and connecting storm sewer to the backyard depressional areas. The inlet capacity will be increased at the following locations:

- Low point on Wisconsin (north of Madison)
- Low point on Addison (north of Madison, Proposed Alternative 1a)
- Low point of Wisconsin (south of Madison)
- Low point of Michigan (south of Madison)
- Backyard depressional areas that have new storm sewer connections

Table 6.1.2.3 on the following page shows the existing and proposed peak elevations that would result from Proposed Alternative 1c.



Table 6.1.2.3 - Summary of Peak Elevations at Locations in Problem Area 1 with Proposed Alternative 1c

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (P1c)	Baseline Peak Elevation	Proposed Peak Elevation (P1c)	Baseline Peak Elevation	Proposed Peak Elevation (P1c)	Baseline Peak Elevation	Proposed Peak Elevation (P1c)
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.56	699.42	705.17	698.24	707.53	702.11	707.21	698.76
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.56	700.09	705.17	699.78	707.53	702.35	707.21	699.87
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.56	701.17	705.75	700.75	707.51	702.31	707.20	701.31
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	704.73	695.95	704.56	695.45	705.13	703.19	704.89	695.64
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.17	705.51	706.73	705.50	707.32	705.51	707.08	705.50
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	703.70	701.51	702.70	701.50	704.74	701.69	703.78	701.51
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	702.19	695.78	701.71	695.54	704.14	698.24	703.58	695.65
JMS-Pond	Jackson Middle School Pond*	682.20	689.80	689.17	685.70	687.53	687.77	690.43	689.51	690.05	689.80
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	672.97	670.52	670.14	674.55	674.44	672.98	672.53

*Damage elevations for the Jackson Middle School Pond and the Lufkin Park Basin are actually the overtopping elevations

XX Elevation above potential damage elevation for houses

The results show that potential damages were eliminated from all but the four houses at Washington and Addison in Problem Area 1 with the proposed improvements, but as discussed in section 6.1.1, the Village instructed V3 not to focus on the flooding problem at Washington and Addison because the flooding issues within the Washington Street corridor are being evaluated separately as part of a green infrastructure grant provided by the County. Also, street flooding was reduced to less than six inches in all locations.

In addition, the results show that this proposed alternative reduces the elevation in Jackson Pond to below the overtopping elevation for all storm events. As a result, this also lowers the peak elevations in Lufkin Pond.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$6.7M.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits would be issued directly by the Village.
- A notice of intent must be submitted to the Illinois Environmental Protection Agency for compliance with ILR10, water quality from runoff from construction sites.
- Coordination with FEMA and INDR-OWR may be necessary as the additional detention will be located within or near to the regulatory floodway and floodplain.
- IDNR-OWR Regional Permit for Utility Construction in Floodway.
- US Army Corps of Engineers for utility connection to creek.
- DuPage County Stormwater Permit for impacts to floodplain and riparian area.



6.1.2.4 Proposed Alternative 1d

Buyouts for detention with additional conveyance and inlet capacity improvements

Proposed Alternative 1d is a potential solution to the flooding in Problem Area 1 that does not require storage to be placed on the school district's property. The alternative requires the buyouts of houses in two areas for detention storage. The first area is located between Addison and Wisconsin, north of Madison. Approximately 8.8 acre-feet of storage will be required in this area and it is estimated that the buyout of 8 houses will be required to achieve this volume. The second area is located south of Madison between Michigan and Harvard. This basin is sized to store approximately 8.6 acre-feet and it is estimated that the buyout of nine houses would be required to achieve this volume.

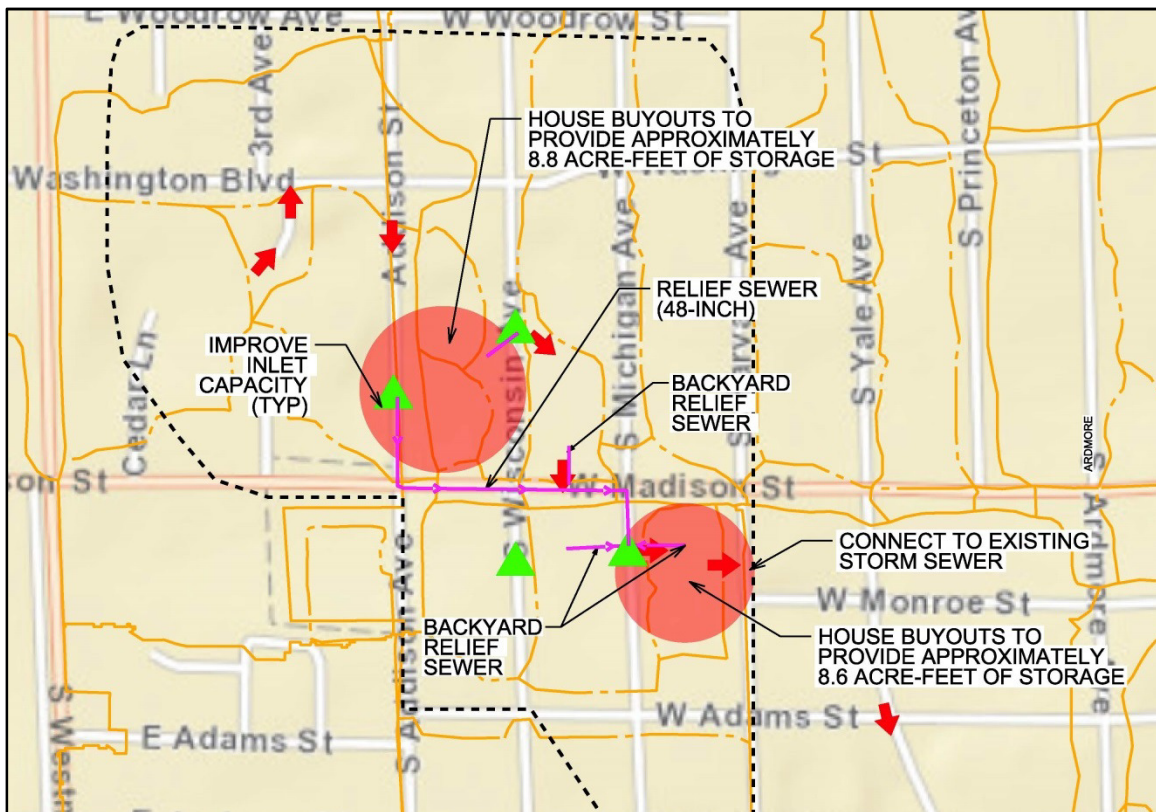


Figure 6.1.2.4 – Proposed Improvements for Proposed Alternative 1d

In addition to the storage provided in these two basins, this alternative also includes improvements to the inlet capacity in several locations, storm sewer connections to backyard depressional areas, and a new 48-inch storm sewer running between the two proposed basins.

As was the case in Proposed Alternative 1c, the intent of this alternative is to remove each house from damage and to limit ponding in the street to less than a foot for emergency vehicle access.



It was assumed that the Village can obtain the easements necessary to install the proposed storm sewer within the private property.

Table 6.1.2.4 on the following page shows the existing and proposed peak elevations that would result from Proposed Alternative 1d.



Table 6.1.2.4 - Summary of Peak Elevations at Locations in Problem Area 1 with Proposed Alternative 1d

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (p1d)	Baseline Peak Elevation	Proposed Peak Elevation (p1d)	Baseline Peak Elevation	Proposed Peak Elevation (p1d)	Baseline Peak Elevation	Proposed Peak Elevation (p1d)
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.56	700.10	705.17	700.47	707.53	703.53	707.21	702.39
Node373	Proposed Basin between Addison and Wisconsin (North of Madison)	697.00	704.74	706.56	700.10	705.17	700.47	707.53	703.54	707.21	702.40
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.56	701.04	705.75	700.65	707.51	704.30	707.20	702.72
S03-04	Proposed Basin between Wisconsin and Michigan (North of Madison)	695.00	703.98	704.73	699.80	704.56	699.42	705.13	701.59	704.89	701.13
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.17	700.99	706.73	700.51	707.32	705.03	707.08	701.20
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	703.70	701.51	702.70	701.50	704.74	702.29	703.78	701.51
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	702.19	697.30	701.71	696.31	704.14	701.59	703.58	701.12
JMS-Pond	Jackson Middle School Pond*	682.20	689.80	689.17	689.15	687.53	687.53	690.43	690.43	690.05	690.05
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	673.01	670.52	670.37	674.55	674.55	672.98	672.55

*Damage elevations for the Jackson Middle School Pond and the Lufkin Park Basin are actually the overtopping elevations

XX Elevation above potential damage elevation for houses

The results show that potential damages were eliminated from all but the four houses at Washington and Addison in Problem Area 1 with the proposed improvements, but as discussed in section 6.1.1, the village instructed V3 not to focus on the flooding problem at Washington and Addison because the flooding issues within the Washington Street corridor are being evaluated separately as part of a green infrastructure grant provided by the County. Also, street flooding was reduced to less than eight inches in all locations.

Although damages were eliminated from the homes in Problem Area 1, it should be noted that Jackson Pond still overtops in the 100-year storm events.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$8.4M.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits would be issued directly by the Village.
- A notice of intent must be submitted to the Illinois Environmental Protection Agency for compliance with ILR10, water quality from runoff from construction sites.



6.2 Problem Area 2: Washington and Euclid

After discussions with Villa Park, the low point at the intersection of Washington and Euclid was identified as a Problem Area. Specifically, the low area behind the homes at the northwest corner of the intersection was identified. This area is drained by a 12" storm sewer and the lowest overflow elevation is approximately 680.00 located between 542 and 546 S. Euclid Drive.

6.2.1 Baseline Condition Analysis

There are approximately 10.3 acres of backyard areas to the north that are tributary to this low area and the 12 inch outlet pipe is not sufficiently sized to handle the flow. In addition, the downstream sewer system under Washington is a 36-inch and very flat so there is limited capacity in that system as well. This suggests that even if the outlet pipe from the low area was increased, there would not be significant benefit realized.

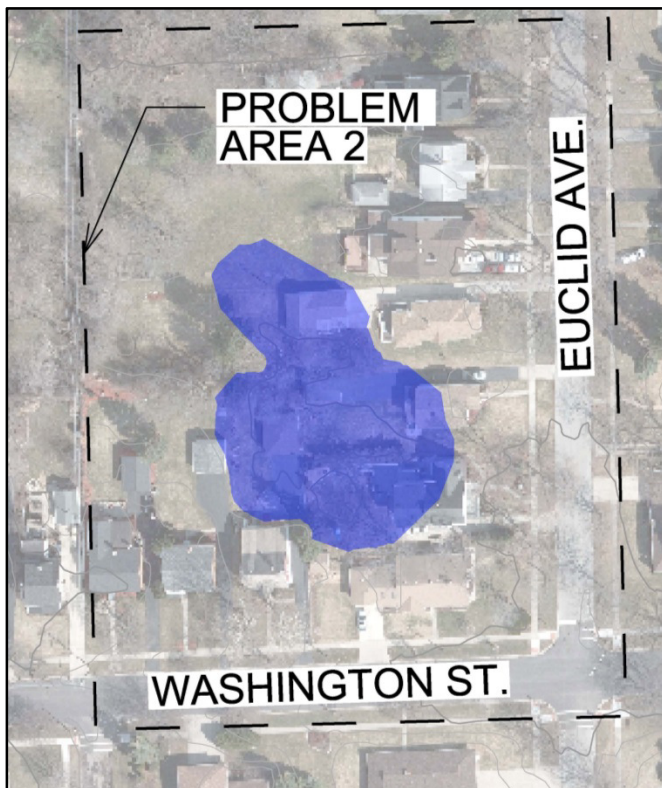


Figure 6.2.1 – Problem Area 2 Location

6.2.2 Conclusions

After coordination with the Village, it was decided that the flooding at the intersection of Washington and Euclid will be addressed by the flood control study prepared by Christopher B. Burke Engineering, Ltd.



6.3 Problem Area 3: Flooding along South Rand Road

Another Problem Area that was identified by the Village was the overflow between Rand Road and Lufkin Pond.

6.3.1 Baseline Condition Analysis

Approximately 36 acres is tributary to the storm sewer system north of Jackson between Harvard Avenue and Ardmore Avenue and is drained by a 24-inch storm sewer at the downstream end. Any runoff that does not get captured by the inlets or that cannot be conveyed by this 24-inch sewer runs overland to Yale Street and south to Jackson. In large storm events, this flow will “jump” the ridge of the roadway (Jackson) and run down Rand Road. There is an intermediate low area in Rand Road with an approximate elevation of 678.0 where water will pond before flowing down the road to the ultimate low point at the intersection of Rand Road and Willow Crest Drive (approximate rim elevation of 676.0). In large storm events, this intermediate low area inundates until it can overflow to the south within the roadway at an elevation of 678. At, 678.3, runoff can overflow through the grass between 1027 Rand Road and 1033 Rand Road.

The home at 1027 Rand Road has a depressed driveway with an overflow point of about 678.5 and is located next to a likely overflow route. In high intensity events with significant flow in the streets (1-hour and 2-hour events), the elevation gets above 678.5 and overflows between homes and also into the depressed driveway of 1027 Rand Road.

The ultimate low point on Rand Road at the intersection of Willow Crest Drive also collects water that overflows from Jackson Pond. During large storm events, Jackson Pond will overflow its banks and water will flow between two homes on Leslie Lane, down Willow Crest Drive, across Rand Road and through a concrete swale between two homes into Lufkin Pond. Along this overflow route, water ponds at both the intersection of Leslie Lane and Willow Crest Drive and the intersection of Rand Road and Willow Crest Drive.

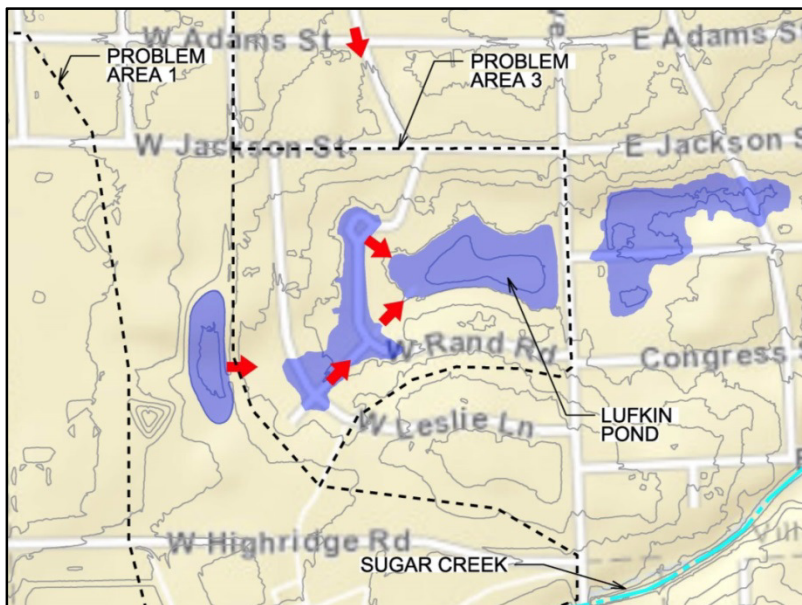


Figure 6.3.1 – Problem Area 3 Location



Table 6.3.1 - Summary of Peak Elevations at Locations in Problem Area 3 (Baseline Conditions)

Node Information		Node Information		10-year, 24-hour (Baseline)	10-year, 24-hour (Baseline)	50-year, 2-hour (Baseline)	50-year, 24-hour (Baseline)	100-year, 2-hour (Baseline)	100-year, 24-hour (Baseline)
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Existing Peak Elevation	Existing Peak Elevation	Existing Peak Elevation	Existing Peak Elevation	Existing Peak Elevation	Existing Peak Elevation
R1657	At 1027 Rand Road	678.00	678.50	678.56	678.01	679.00	678.01	679.15	678.01
R1641	Intersection of Rand Road and Willow Crest Drive	676.00	678.38	677.61	675.67	678.44	675.67	678.76	675.67
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	670.52	674.25	672.21	674.55	672.98
J-01	Structure at Northwest Corner of Jackson and Rand Road	687.50	687.80	688.14	687.50	688.31	687.50	688.40	688.06

*Damage elevations for the Lufkin Park Basin are actually the overtopping elevations

XX Elevation above potential damage elevation for houses



Appendix E shows a potential damage elevation for each house located in or adjacent to an identified problem area. Low opening elevations are provided for each structure and top of foundation and finished floor elevations are included in this table where available from the survey. In the Baseline Conditions, 9 structures were identified with damage (water level above Low Opening) in Problem Area 3.

The damage elevations listed in the table are the low opening elevations for the houses adjacent to low areas and are taken from the survey information where available or are estimated from the LIDAR points provided by Villa Park. Low opening elevations were not approximated for storage sheds or other ancillary structures.

As indicated in Table 6.3.1, this area is showing potential damage even in a 10-year event. The flooding can be attributed to several factors:

- Large amount of overland runoff coming down Rand Road
- Undersized storm sewer and insufficient inlet capacity

6.3.2 Proposed Condition Analysis

Projects proposed for Problem Area 3 include:

- Raise the profile of Rand Road at the intersection with Jackson Avenue by 1-foot to send water east on Jackson and then south on Ardmore. Water will then be diverted from Ardmore Avenue and back into Lufkin Pond. Increase storage volume of Lufkin Pond.
- Increase inlet capacity along Rand Road and install a relief sewer to convey discharge from the low point near 1027 / 1021 Rand Road to Lufkin Pond. Increase storage volume of Lufkin Pond.
- Buy-out 1027 Rand Road and construct swale to Lufkin Pond. Increase storage volume of Lufkin Pond.

As was discussed in section 5.2, each of these alternatives has been evaluated independently and has been modeled according to present-day conditions. Any changes to current drainage conditions would require further analysis. For example, the implementation of Alternatives 1b or 1c for Problem Area 1 could impact overflow from Jackson Pond and would thereby affect the modeling and evaluation of drainage in and around Lufkin Pond.

Additionally, each of the three alternatives proposed for Problem Area 3 have been evaluated independently. For example, Alternative 3b does not build off of improvements in Alternative 3a. The EOPCC supplied for each alternative includes all the improvements associated with that alternative.



6.3.2.1 Proposed Alternative 3a
Raise Rand Road Profile

Proposed Alternative 3a involves reconstructing approximately 100 linear feet of Rand Road to raise the roadway profile at its intersection with Jackson Avenue to a minimum elevation of 688.6. A majority of the runoff within the roadway would then be conveyed east along Jackson Avenue and south on Ardmore rather than down Rand Road. The increased runoff along Jackson Avenue will increase water surface elevations which will require raising the profile of approximately 300 linear feet of sidewalk to create a slight berm to prevent overflow into adjacent yards. Raising the sidewalk to prevent overflow will also result in driveway and yard grading and the need for interior drainage. Additionally, minor inlet capacity improvements are necessary at the intersection of Rand Road and Willow Crest Drive.

The increased runoff conveyed south along Ardmore Avenue will be diverted west into Lufkin Pond. Lufkin Pond is proposed to be expanded by approximately 4 acre-feet compared to the existing volume.

Removing this excess runoff from Rand Road allows the existing storm sewer system to handle what is tributary under proposed conditions.

Table 6.3.2.1 below provides results of the proposed improvements associated with Proposed Alternative 3a.

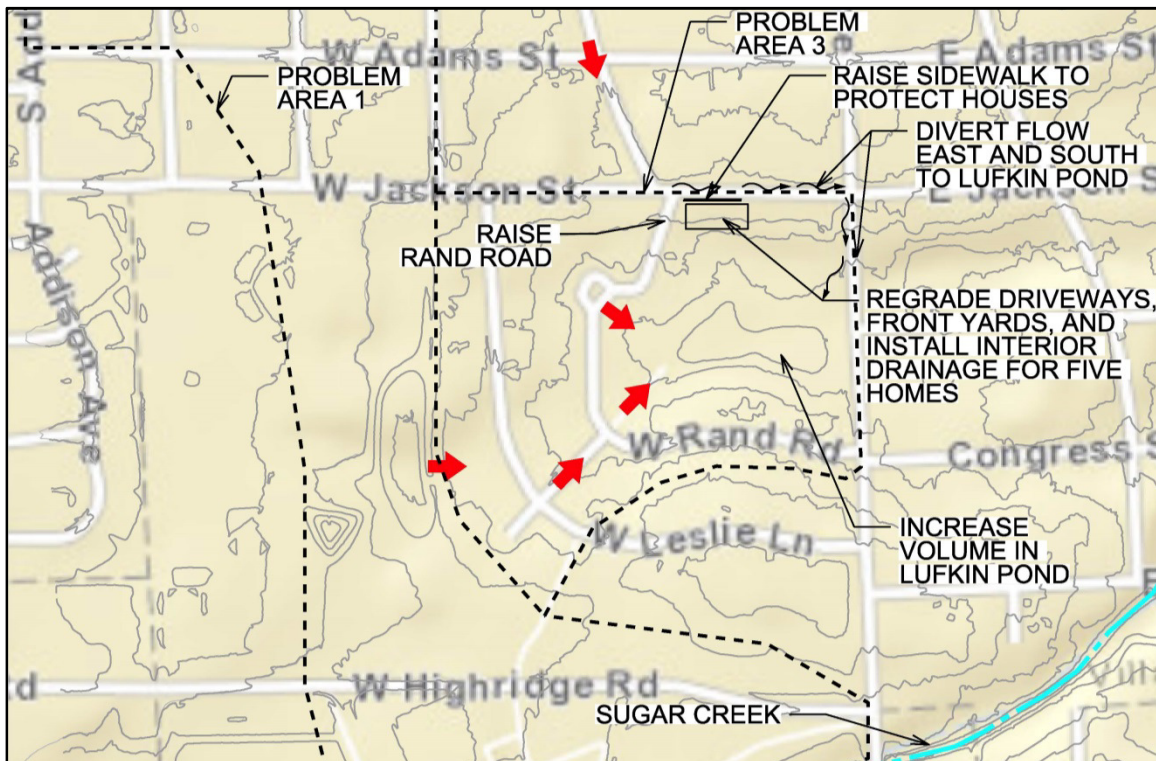


Figure 6.3.2.1 – Proposed Improvements for Proposed Alternative 3a



Table 6.3.2.1 - Summary of Peak Elevations at Locations in Problem Area 3 with Proposed Alternative 3a

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (P3a)	Baseline Peak Elevation	Proposed Peak Elevation (P3a)	Baseline Peak Elevation	Proposed Peak Elevation (P3a)	Baseline Peak Elevation	Proposed Peak Elevation (P3a)
R1657	At 1027 Rand Road	678.00	678.50	678.56	678.02	678.01	678.01	679.15	678.43	678.01	678.01
R1641	Intersection of Rand Road and Willow Crest Drive	676.00	678.38	677.61	677.28	675.67	675.67	678.76	677.98	675.67	675.67
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	672.32	670.52	670.23	674.55	674.19	672.98	672.44
J-01	Structure at Northwest Corner of Jackson and Rand Road	687.50	687.80	688.14	688.65	687.50	687.50	688.40	689.16	688.06	687.94

*Damage elevation for the Lufkin Park Basin is actually the overtopping elevation

XX	Elevation above potential damage elevation for houses
XX	Homes will be protected by a berm or elevated sidewalk to prevent runoff from overflowing onto their property.



As seen in Table 6.3.2.1, the results indicate that these improvements will remove potential flooding that currently results in structural damage in this area. All of the nine homes that were shown as being damaged during flood events have been addressed.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$742,000.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits could be obtained fairly easily through Villa Park.
- Permits or approvals from FEMA are not anticipated.



6.3.2.2 Proposed Alternative 3b

Increase Inlet Capacity in Rand Road and Discharge to Lufkin Pond

Proposed Alternative 3b involves adding additional inlets and storm sewer along Rand Road to collect a majority of the overland runoff and conveying the discharge to Lufkin Pond through a 48-inch pipe. The pipe would likely run between 1021 and 1027 Rand Road or between 1027 and 1033 Rand Road. Inlet spacing and sizing would be improved to capture the flow in the roadway during the design storm event. Final design of the inlet structures will be performed in the final engineering phase. Additionally, minor inlet capacity improvements would also be required at the intersection of Rand Road and Willow Crest Drive.

Lufkin Pond is proposed to be expanded by approximately 4-acre feet (compared to the existing volume) to accommodate the additional runoff currently being collected in the roadway.

Collecting this runoff within Rand Road and discharging it directly to the basin will also help reduce ponding at the intersection of Rand Road and Willow Crest Drive.

Table 6.3.2.2 below provides results of the proposed improvements associated with Proposed Alternative 3b.

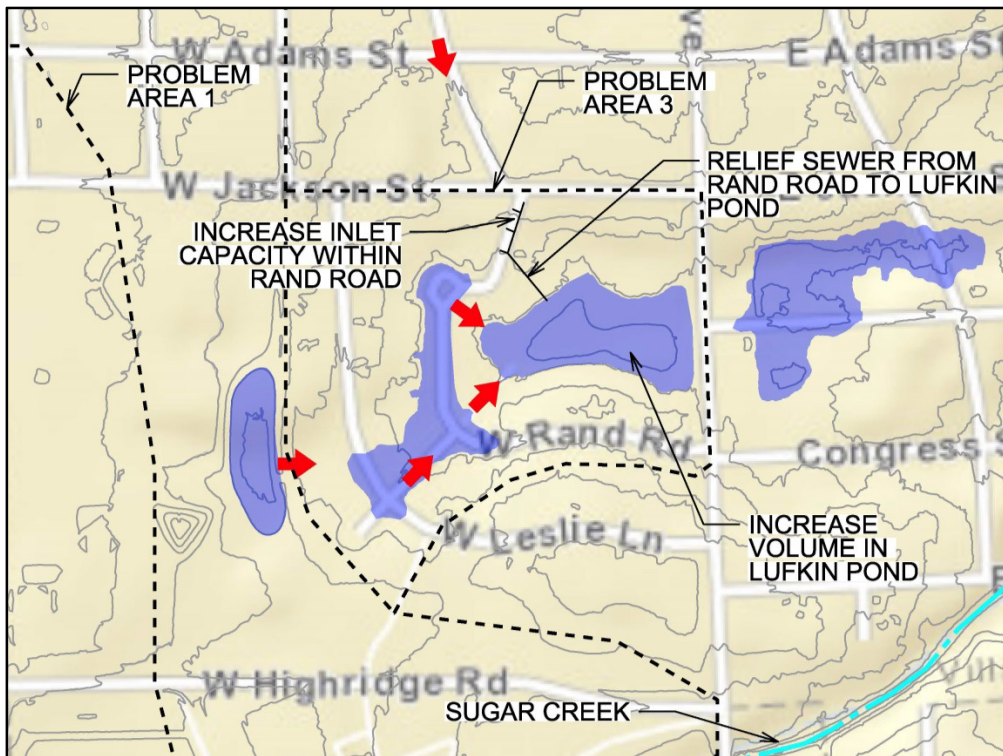


Figure 6.3.2.2 – Proposed Improvements for Proposed Alternative 3b



Table 6.3.2.2 - Summary of Peak Elevations at Locations in Problem Area 3 with Proposed Alternative 3b

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (p3b)	Baseline Peak Elevation	Proposed Peak Elevation (p3b)	Baseline Peak Elevation	Proposed Peak Elevation (p3b)	Baseline Peak Elevation	Proposed Peak Elevation (p3b)
R1657	At 1027 Rand Road	678.00	678.50	678.56	678.01	678.01	678.00	679.15	678.50	678.01	678.00
R1641	Intersection of Rand Road and Willow Crest Drive	676.00	678.38	677.61	677.28	675.67	675.67	678.76	678.08	675.67	675.67
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	672.33	670.52	670.23	674.55	674.33	672.98	672.49

*Damage elevation for the Lufkin Park Basin is actually the overtopping elevation

XX Elevation above potential damage elevation for houses

Similar to alternative 3a, these improvements remove potential flooding problems that result in structural damage in this area. There will still be minor flooding in the roadway, but it is less than six inches.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$665,000.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits could be obtained fairly easily through Villa Park.
- Permits or approvals from FEMA are not anticipated



6.3.2.3 Proposed Alternative 3c
Buyout for 1027 Rand Road, construct swale to Lufkin Pond

Proposed Alternative 3c involves buying out 1027 Rand Road and constructing a swale in its place to direct flow to Lufkin Pond. The house at 1027 has a depressed driveway and as a result the garage and basement level flood frequently. Minor pavement and curb reconstruction may be necessary to funnel the storm water runoff to the proposed swale. Additionally, minor inlet capacity improvements are necessary at the intersection of Rand Road and Willow Crest Drive.

Lufkin Pond is proposed to be expanded by approximately 4-acre feet (compared to the existing volume) to accommodate the additional runoff currently being collected in the roadway.

Collecting this runoff within Rand Road and discharging it directly to the basin will also help reduce ponding at the intersection of Rand Road and Willow Crest Drive.

Table 6.3.2.3 below provides results of the proposed improvements associated with Proposed Alternative 3b.

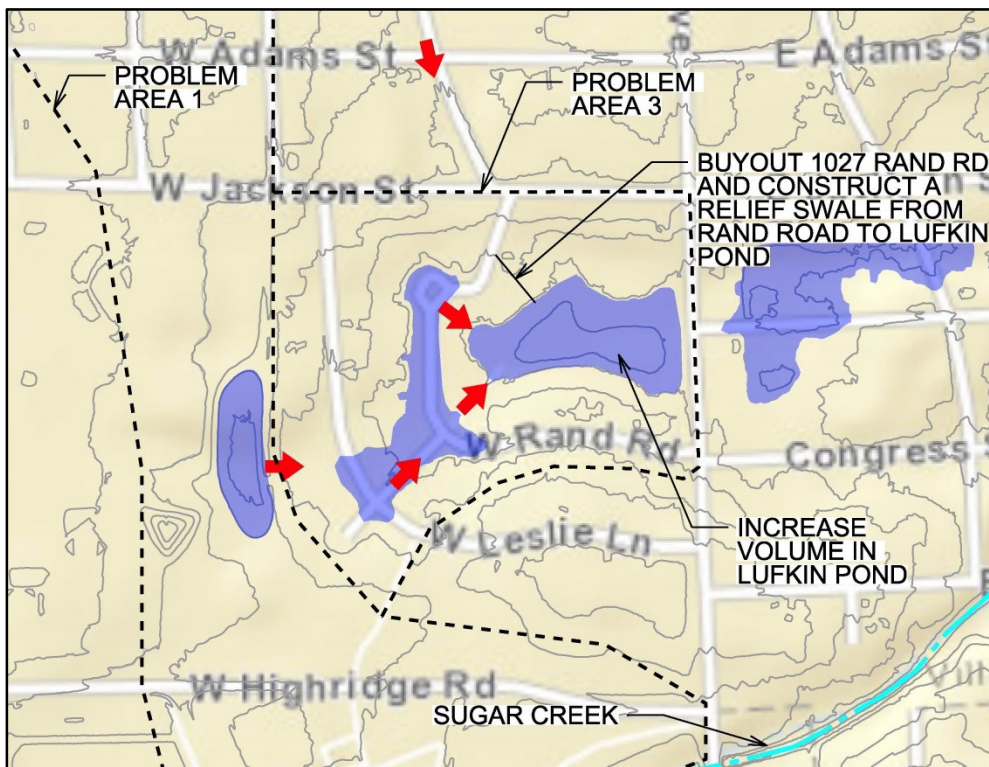


Figure 6.3.2.3 – Proposed Improvements for Proposed Alternative 3c



Table 6.3.2.3 - Summary of Peak Elevations at Locations in Problem Area 3 with Proposed Alternative 3c

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (p3c)	Baseline Peak Elevation	Proposed Peak Elevation (p3c)	Baseline Peak Elevation	Proposed Peak Elevation (p3c)	Baseline Peak Elevation	Proposed Peak Elevation (p3c)
R1657	At 1027 Rand Road	678.00	678.70	678.56	678.27	678.01	678.00	679.15	678.67	678.01	678.00
R1641	Intersection of Rand Road and Willow Crest Drive	676.00	678.38	677.61	677.41	675.67	675.67	678.76	678.33	675.67	675.67
Lark-PND	Lufkin Park Basin*	668.00	673.50	673.06	672.30	670.52	670.23	674.55	674.33	672.98	672.49

*Damage elevation for the Lufkin Park Basin is actually the overtopping elevation

XX Elevation above potential damage elevation for houses

Similar to Alternative 3a, these improvements remove potential flooding problems that result in structural damage in this area. There will still be minor flooding in the roadway, but it is less than six inches.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$865,000.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits could be obtained fairly easily through Villa Park.
- Permits or approvals from FEMA are not anticipated



6.4 Problem Area 4: Back Yard Low Areas Adjacent to Van Buren Street

Low areas in back yards north and south of Van Buren Street have been identified as flood prone areas.

6.4.1 Baseline Condition Analysis

Existing storm sewers run through the north and south low areas to help drain these areas. The south area is drained by a 48-inch storm sewer while a 24-inch storm sewer drains the north area. The areas receive runoff from direct tributary storm runoff and by storm water overflows.

The southern area has to fill approximately 2.5-feet (671.5) before it will overtop Van Buren Street and flow north into the northern low area. Based on the existing conditions model, this occurs in approximately the 100-year, 2-hour event. Potential overflow to the east or south would occur at an even higher elevation, such as 673.0.

The northern area would also have to fill approximately 2.5-feet, from 667.0 to 669.5, before it would overflow to the east. The approximate damage elevation in this area is 669.4, so any event that reaches this overflow elevation will likely cause some damage to adjacent properties.

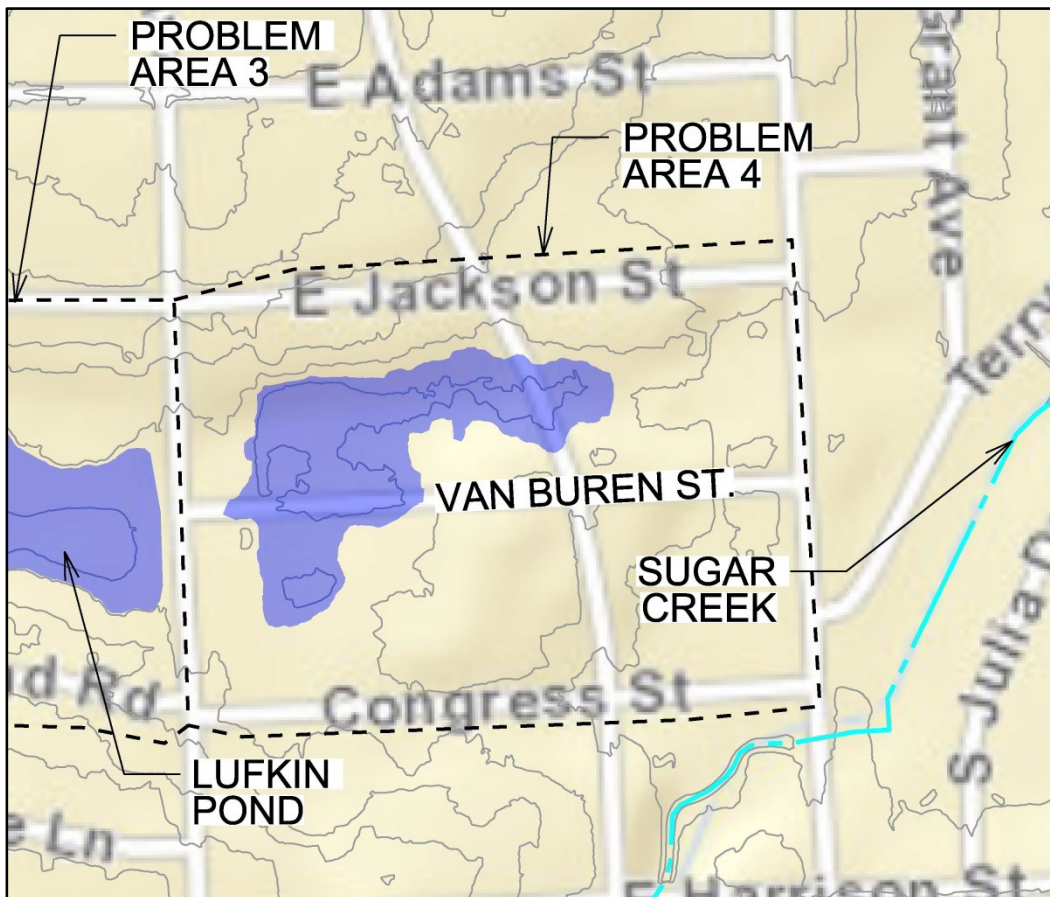


Figure 6.4.1 – Problem Area 4 Location



Table 6.4.1 - Summary of Peak Elevations at Locations in Problem Area 4 in Baseline Conditions

Node Information		Node Information		10-year, 24-hour (Baseline)	10-year, 24-hour (Baseline)	50-year, 2-hour (Baseline)	50-year, 24-hour (Baseline)	100-year, 2-hour (Baseline)	100-year, 24-hour (Baseline)
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation	Peak Elevation
DIV-54	Low Point in backyards between Van Buren St and Jackson St	678.00	669.40	669.96	665.42	670.81	669.83	671.23	670.39
SW-1120	Low Point in backyards between Van Buren St and Congress St	676.00	670.40	670.16	669.03	670.94	669.93	671.25	670.43

The damage elevations listed in the table are the low opening elevations for the houses adjacent to low areas and are taken from the survey information where available or are estimated from the LIDAR points provided by Villa Park. Low opening elevations were not approximated for storage sheds or other ancillary structures.

As shown, these areas show potential damage even in a 10-year event. The flooding can be attributed to several factors:

- Tributary to floodplain
- Large amount of overland runoff
- Undersized storm sewer to draining the areas



6.4.2 Proposed Condition Analysis

The main cause of the potential flooding north of Van Buren is an undersized storm sewer draining the area. The area north of Van Buren receives storm water runoff from its direct tributary area (approximately 4.5 acres) and also from overflow off of Ardmore Avenue and Van Buren St. The existing 24-inch cannot convey all of the flow that is coming to this area so it inundates until the area can overflow to the east and then south.

The south area is very limited due to its proximity to Sugar Creek. Due to the impact of the tailwater from the floodplain, the south area and its proposed alternatives may need to be revisited in more detail in the future once the County's detailed floodplain modeling is complete.

6.4.2.1 *Proposed Alternative 4a*

Relief Sewer from north of Van Buren Street to Sugar Creek

Proposed Alternative 4a involves constructing a 66-inch relief sewer from the low area north of Van Buren Street to the east and ultimately discharge into Sugar Creek at Cross Street. The large diameter pipe will convey storm water runoff to Sugar Creek and also provide additional volume underground to decrease ponding in the backyards. This alternative assumes that the storm sewer needs to stay within the right-of-way.

Discharging at Summit Avenue was also considered, but the tailwater from Sugar Creek at Summit is significantly higher than Cross Street, so an oversized storm sewer has little effect on the flooded areas when discharging at Summit Avenue. This is also the location where the 48-inch pipe that drains the low area south of Van Buren discharges, which is why there is little potential to significantly improve the high water elevation south of Van Buren.

Table 6.4.2.1 below provides results of the proposed improvements associated with Proposed Alternative 4a.

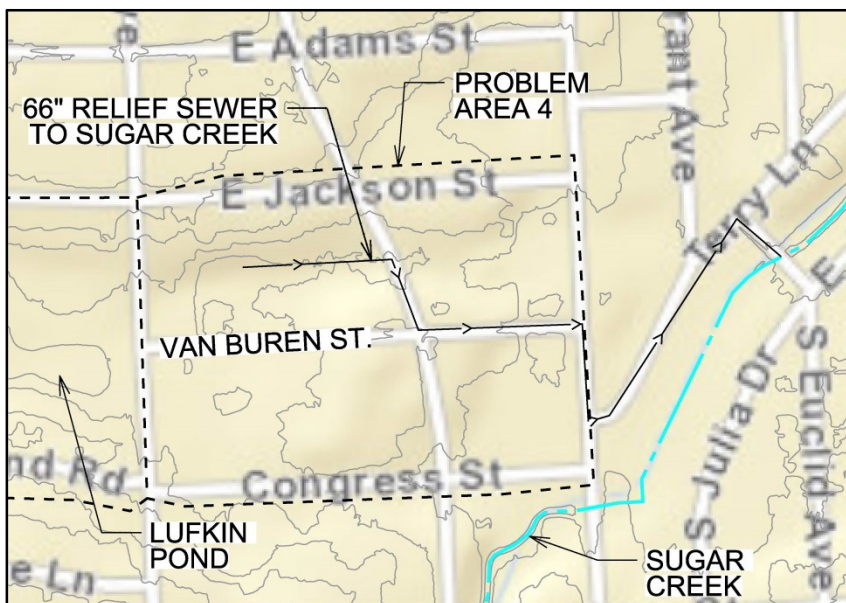


Figure 6.4.2.1 – Proposed Improvements for Proposed Alternative 4a



Table 6.4.2.1 - Summary of Peak Elevations at Locations in Problem Area 4 with Proposed Alternative 4a

Node Information		Node Information		10-year, 2-hour		10-year, 24-hour		100-year, 2-hour		100-year, 24-hour	
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Baseline Peak Elevation	Proposed Peak Elevation (p4a)	Baseline Peak Elevation	Proposed Peak Elevation (p4a)	Baseline Peak Elevation	Proposed Peak Elevation (p4a)	Baseline Peak Elevation	Proposed Peak Elevation (p4a)
DIV-54	Low Point in backyards between Van Buren St and Jackson St	678.00	669.80	669.96	663.97	665.42	663.96	671.23	669.54	670.39	665.52
SW-1120	Low Point in backyards between Van Buren St and Congress St	676.00	670.40	670.16	670.16	669.03	669.03	671.25	671.11	670.43	670.32

XX Elevation above potential damage elevation for houses

As indicated in Table 6.4.2.1, the relief sewer significantly reduces the potential ponding depths north of Van Buren Street and eliminates the homes from potential damage from flooding. The water surface elevation south of Van Buren decreases slightly, but remains dictated by the tailwater connection at Sugar Creek.

Additionally, because there is no available space to expand storage capacity within the area, water must be conveyed directly to Sugar Creek. For this reason, Alternative 4a causes an increase in both flow rate and water surface elevation in Sugar Creek. Since Sugar Creek is currently being studied by DuPage County, it is recommended that this alternative be re-evaluated once the County's study of Sugar Creek is complete and the true impact of this solution can be evaluated.

Engineer's Opinion of Probable Cost

An Engineer's Opinion of Probable Construction Cost (EOPCC) was prepared. The total cost of these improvements is estimated at \$1.9M.

Detailed cost opinion information is provided in Appendix B.

Permitting Requirements

The permitting requirements associated with this proposed alternative are described below:

- It is assumed that roadway grading / construction / building permits would be issued directly by the Village.
- A notice of intent must be submitted to the Illinois Environmental Protection Agency for compliance with ILR10, water quality from runoff from construction sites.
- Coordination with FEMA and INDR-OWR may be necessary as the additional detention will be located within or near to the regulatory floodway and floodplain.
- IDNR-OWR Regional Permit for Utility Construction in Floodway.
- US Army Corps of Engineers for utility connection to creek.
- DuPage County Stormwater Permit for impacts to floodplain and riparian area.



7 Additional Alternatives

In addition to the alternatives presented at the specific Problem Areas described above, the Village of Villa Park may wish to consider the following proposed alternatives and best management practices:

7.1 Encourage purchase of Flood Insurance

Many homeowners located in the identified problem areas experience flooding of their home, but very few of these homes are actually located within the regulatory floodplain as defined on the FEMA FIRM. While homeowners that are located within the mapped floodplain are required to buy flood insurance for federally-backed mortgages, some long-time homeowners may not have a mortgage (and subsequently, may not have flood insurance). These homeowners, as well as other homeowners not living within the mapped floodplain, are eligible for flood insurance. Those located outside of the floodplain are eligible for a reduced rate due to their non-floodplain location. Having flood insurance may help homeowners recover losses incurred due to storm events that are beyond the magnitude of the design storm events used in this report.

7.2 Join Community Rating System

The Village of Villa Park may wish to join the Community Rating System (CRS) if they are not already a participant. Joining CRS would enable any resident in Villa Park who pays flood insurance to pay a reduced rate, due to their CRS status. Often, a jurisdiction in Northeast Illinois that already has a storm water and floodplain management ordinance (such as the DuPage County Countywide Stormwater and Flood Plain Ordinance) can join the program with minimal additional effort; simply having the ordinance often clears the first hurdle for entry into the CRS program.

7.3 Private Lot Grading

There are likely many locations within Villa Park where poor grading on individual properties contributes to localized flooding. The alternatives within this study mostly evaluated improvements within the right-of-way and not within private lots. Problem Area 1 includes installation of storm sewer within selected private property and Problem Area 2 includes grading on private property. If any of the conveyance alternatives are selected, then the Village may wish to consider implementing a program to allow residents to be reimbursed, either partially or fully, for improvements they make on their private property to facilitate drainage of their property. Such improvements would include construction of a yard drain or a side yard swale. Unless otherwise indicated, the calculations for the right-of-way conveyance system assume all private property runoff can reach the ROW.

8 Summary and Recommendations

8.1 Summary

Table 8.1 below summarizes the proposed alternatives, the number of homes that would benefit from the proposed alternatives, and the engineer's opinion of probable construction cost for each alternative.



Table 8.1 - Summary of Proposed Alternatives

Proposed Alternative ID	Proposed Alternative Location and Description	Number of Houses* with Modeled Structural Damage		EOPCC**
		10-yr, 2-hr	100-yr, 2-hr	
	Existing for Problem Area 1	53	83	--
1a	Increase Inlet Capacity and Madison and Addison	53	82	\$33,000
1b	Alternative 1a and Relief Sewer and Jackson Pond	14	50	\$4,307,000
1c	Alternative 1b and Swale to detention in Willowbrook HS	0	4***	\$6,744,000
1d	Buy out option for Problem Area 1 (does not build off of Alternative 1c)	0	4***	\$8,381,000
2	Improvements for Problem Area 2 are included in study prepared by CBBEL.	3 (existing)	3 (existing)	--
	Existing for Problem Area 3	1	9	
3a	Reconstruct Rand Road	0	0	\$742,000
3b	Install additional storm sewer in Rand Road and discharge to Lufkin	0	0	\$665,000
3c	Buyout 1027 Rand Road and Install swale to Lufkin Pond	0	1	\$865,000
4a	Improvements on Van Buren (lots to north and south)	5 (existing)	8 (existing)	--
		1 (south)	2 (south)	\$1,856,000

*Some properties are located in more than one problem area, but these homes are not double counted. The number of structures and homes impacted are unique.

**Some costs are double-counted. For example, the cost for Proposed Alternative 1b includes all the inlet capacity improvement costs from Alternative 1a.

*** These 4 houses are located at the intersection of Addison and Washington. V3 was instructed not to propose any improvements for these homes since flooding in the Washington Street corridor is being evaluated separately as part of a green infrastructure grant provided by the County.

8.2 Recommendations

Based on a review of the project cost versus the number of homes that would benefit from each project and the severity of flooding experienced in each area, V3's recommendations are Proposed Alternative 1c for Problem Area 1. The recommended Proposed Alternative for Problem Area 3 is Alternative 3b. The recommended Proposed Alternative for Problem Area 4 is Alternative 4a. The recommended projects will reduce flooding durations, depths and potential flood damages, but the projects are not expected to completely eliminate all flooding of their respective areas.

8.2.1 General Recommendations

Several low backyard depressional areas exist throughout the watershed that cause nuisance flooding and possibly minor structural flooding. Many of these areas are not drained with a storm sewer. During minor storm events, these areas may not result in



any issues because water will infiltrate rather quickly. In large events, these areas will pond and without a proper storm sewer discharge or overland discharge, the water has nowhere to go. General recommendations across the watershed are to add backyard drains to these low points and/or provide a lower overflow so water can leave the area without building high enough to cause any damage.

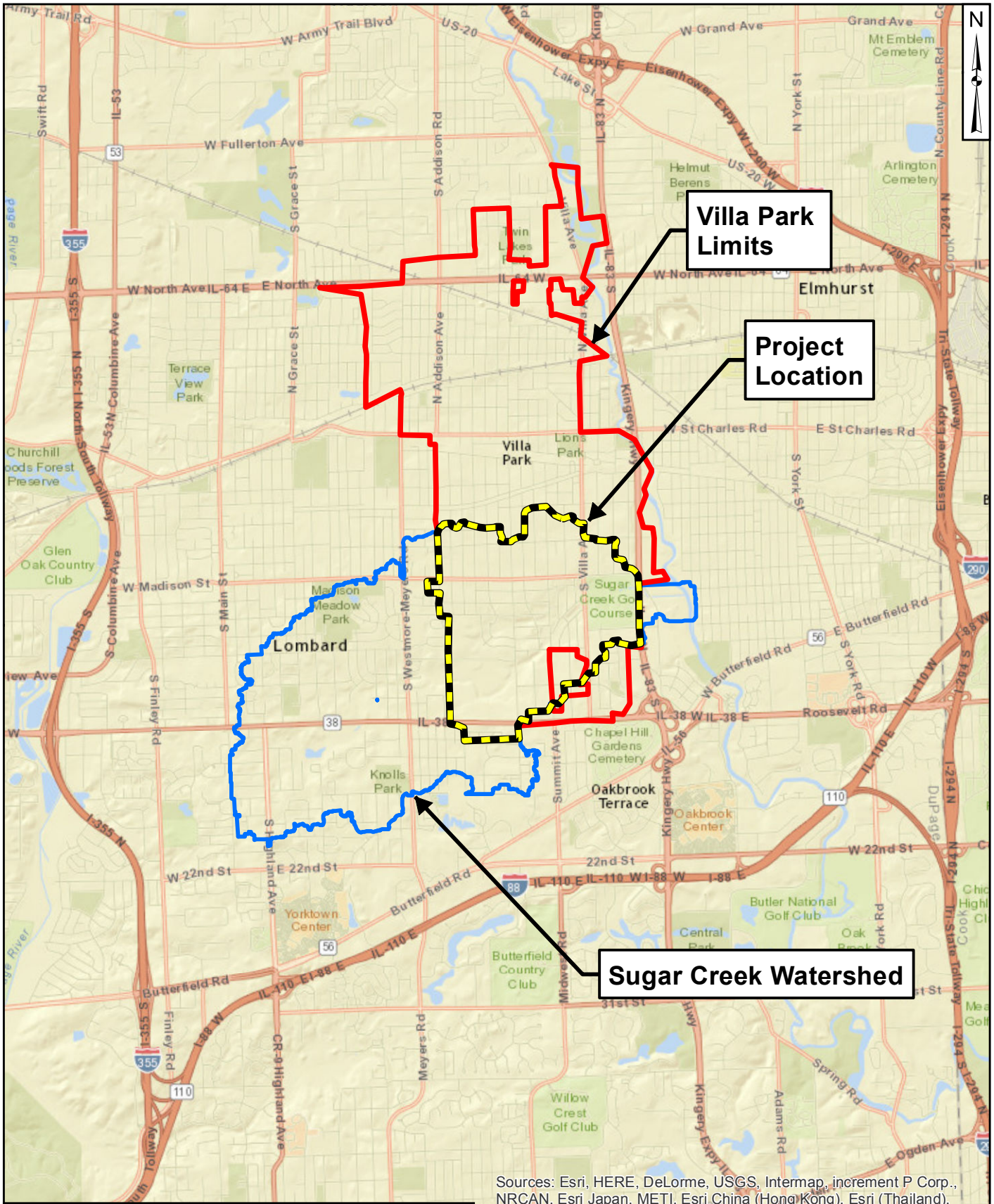
Maintenance of all storm water infrastructure is also recommended. V3 recommends that a regular maintenance protocol be established to keep ditches, overland flow paths, storm sewer inlets, and storm sewers free of debris and sediment.




Exhibits

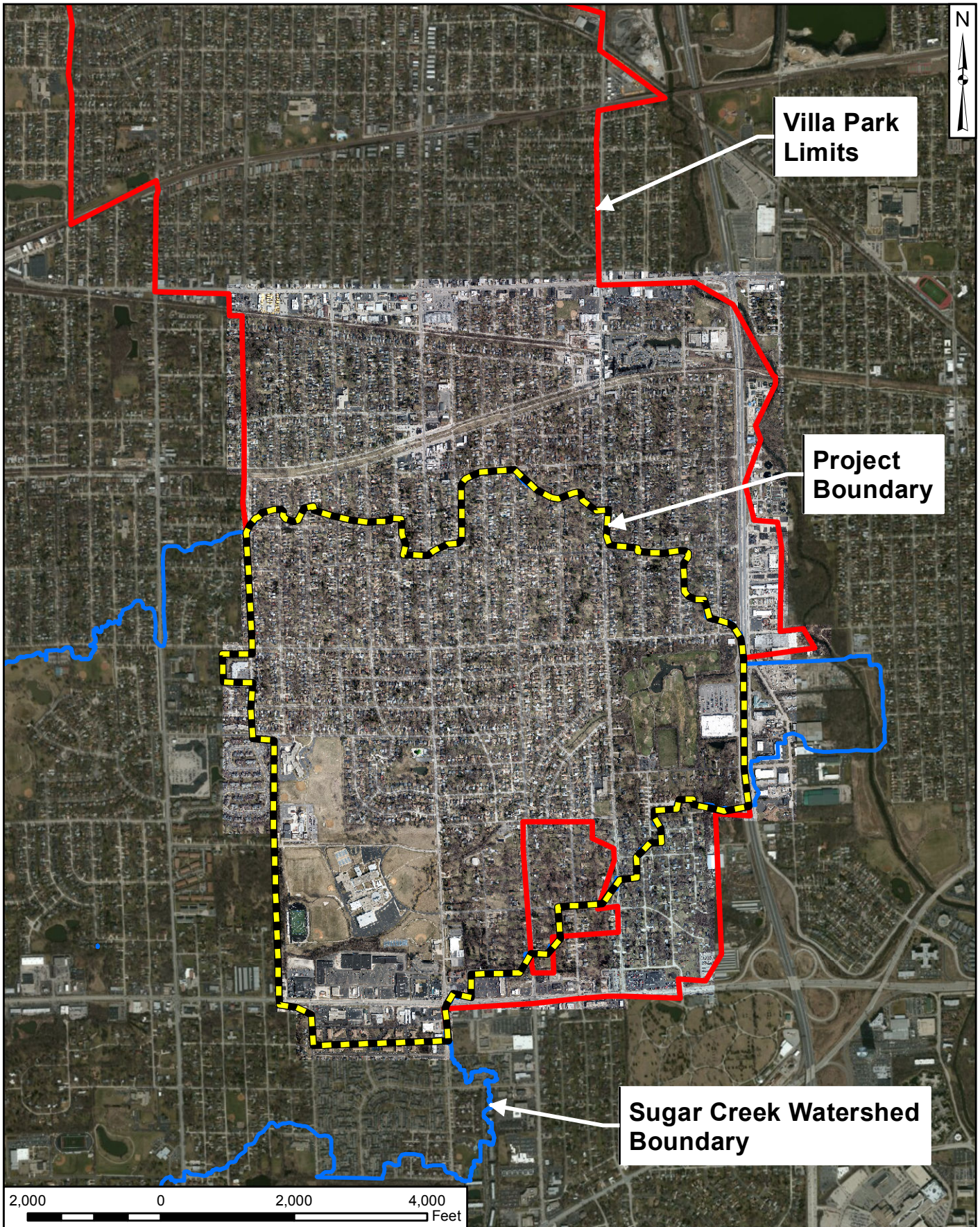
- Exhibit I – Project Location Map
- Exhibit II - Aerial Location Map
- Exhibit III - Soil Survey of DuPage County
- Exhibit IV - USGS Topographic Map
- Exhibit V - USGS Hydrologic Atlas
- Exhibit VI - Flood Insurance Rate Map
- Exhibit VII - DuPage County Regulatory Flood Map
- Exhibit VIII - National Wetlands Inventory Map
- Exhibit IX - DuPage County ADID Wetlands Map
- Exhibit X - Watershed Map
- Exhibit XI - Problem Area Map





Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

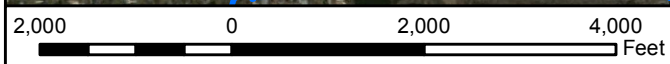
 <p>V3 Companies, Ltd. 7325 Janes Avenue Woodridge, Illinois 60517 630.724.9200 phone 630.724.9202 fax www.v3co.com</p>	<p>TITLE: EXHIBIT I - PROJECT LOCATION MAP</p>	<p>BASE LAYER: Base Layer (Year)</p>
	<p>SITE: SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL</p>	<p>SCALE: See Scale Bar</p>



Villa Park Limits

Project Boundary

Sugar Creek Watershed Boundary




V3 Companies, Ltd.
 7325 Janes Avenue
 Woodridge, Illinois 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

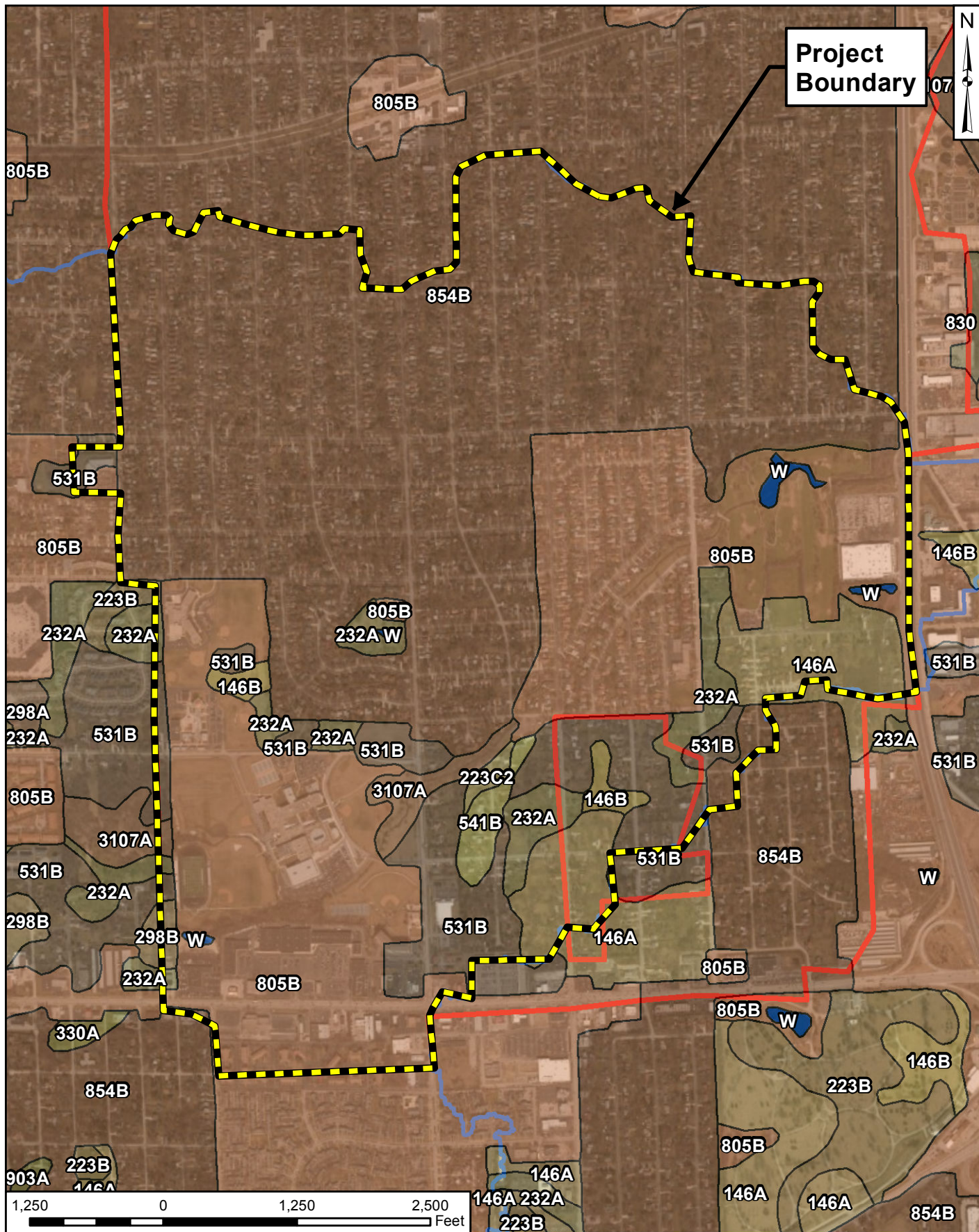
TITLE: **EXHIBIT II - AERIAL LOCATION MAP**

BASE LAYER: Digital Globe

SITE: **SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL**

SCALE: See Scale Bar

DATE: 12/12/14



Project Boundary



V3 Companies, Ltd.
 7325 Janes Avenue
 Woodridge, Illinois 60517
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 630.724.9202 fax
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Visio, Vertere, Virtute... "The Vision To Transform with Excellence"

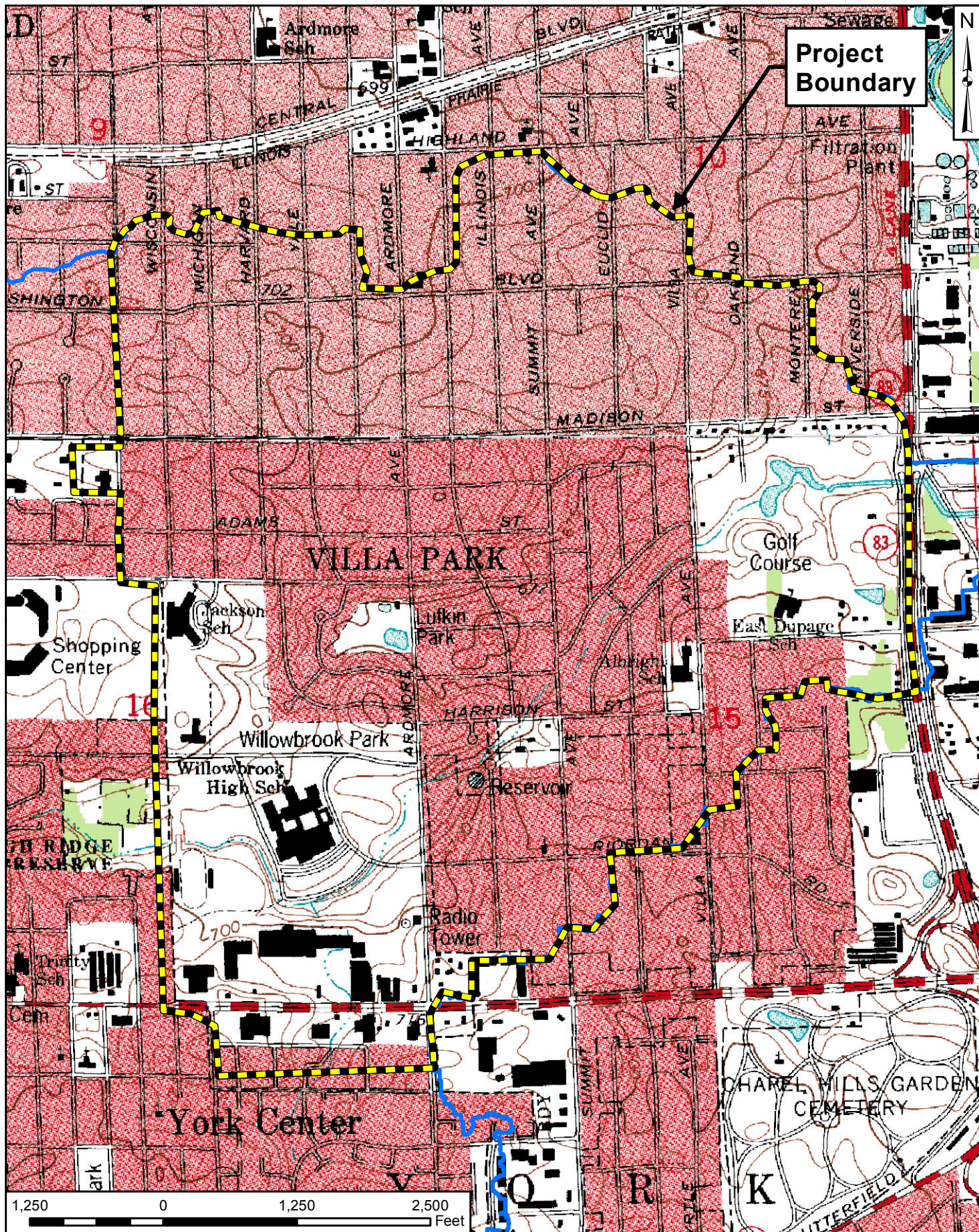
TITLE:
EXHIBIT III - SOIL SURVEY OF DUPAGE COUNTY

SITE:
 SUGAR CREEK WATERSHED STORM
 SEWER ANALYSIS -- VILLA PARK, IL

BASE LAYER:
 DuPage County Soil Survey
 (1999)

SCALE:
 See Scale Bar

DATE:
 12/12/14



Project Boundary

VILLA PARK



V3 Companies, Ltd.
 7325 Janes Avenue
 Woodridge, Illinois 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

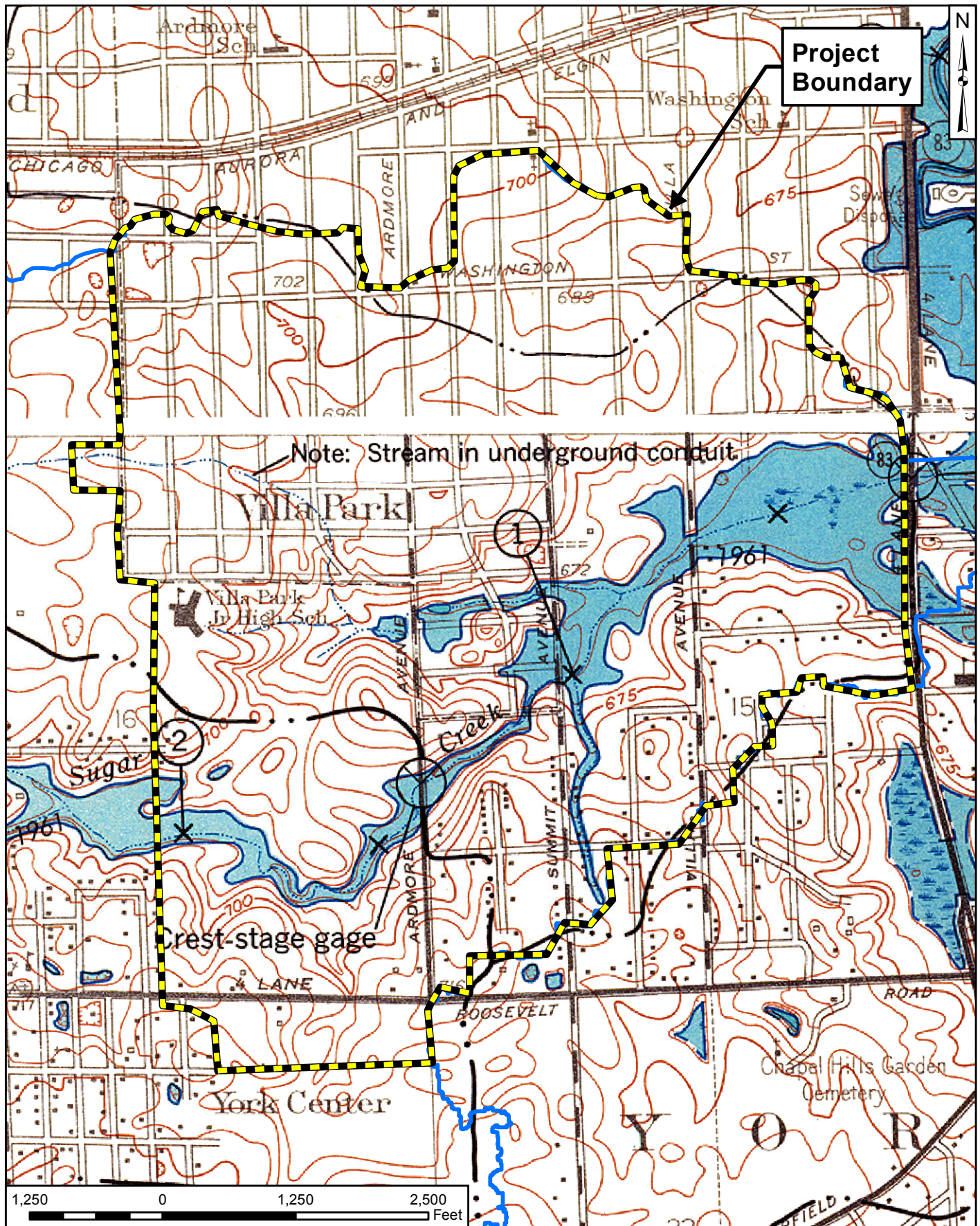
TITLE: **EXHIBIT IV - USGS TOPOGRAPHIC MAP**

SITE: **SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL**

BASE LAYER: **USGS Quadrangle (Elhurst, Hinsdale)**

SCALE: **See Scale Bar**

DATE: **12/12/14**




V3 Companies, Ltd.
 7325 Janes Avenue
 Woodridge, Illinois 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

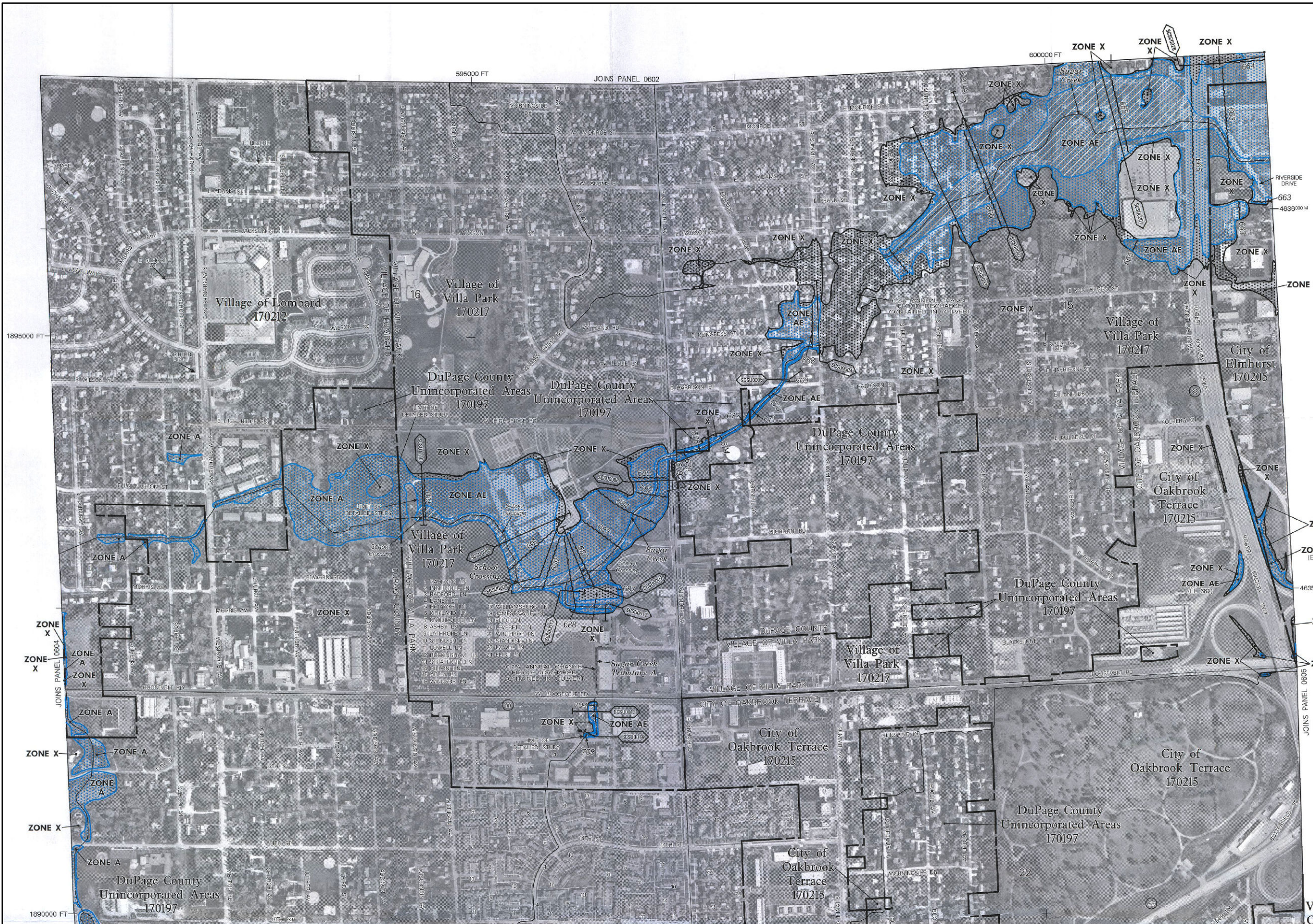
TITLE: **EXHIBIT V - USGS HYDROLOGIC ATLAS**

SITE: **SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL**

BASE LAYER: USGS Hydrologic Atlas (Elhurst, Hinsdale)

SCALE: See Scale Bar

DATE: 12/12/14



this FIRM panel
 River Mile
 MAP REPOSITORY
 Refer to listing of Map Repositories on Map Index
 EFFECTIVE DATE OF COUNTYWIDE
 FLOOD INSURANCE RATE MAP
 December 16, 2004
 EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

Community map revision history prior to countywide mapping, refer to the Community Map Revision History table located in the Flood Insurance Study report for this jurisdiction.
 If flood insurance is available in this community, contact your insurance agent or the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
 250 0 500 1000 FEET
 150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0605H

FIRM
FLOOD INSURANCE RATE MAP
DUPAGE COUNTY,
ILLINOIS
AND INCORPORATED AREAS

PANEL 0605 OF 1006
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ELMHURST, CITY OF	170205	0605	H
DUPAGE COUNTY	170197	0605	H
LOMBARD, VILLAGE OF	170212	0605	H
OAKBROOK, VILLAGE OF	170214	0605	H
OAKBROOK TERRACE, CITY OF	170215	0605	H
VILLA PARK, VILLAGE OF	170217	0605	H

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
17043C0605H

EFFECTIVE DATE
DECEMBER 16, 2004

Federal Emergency Management Agency

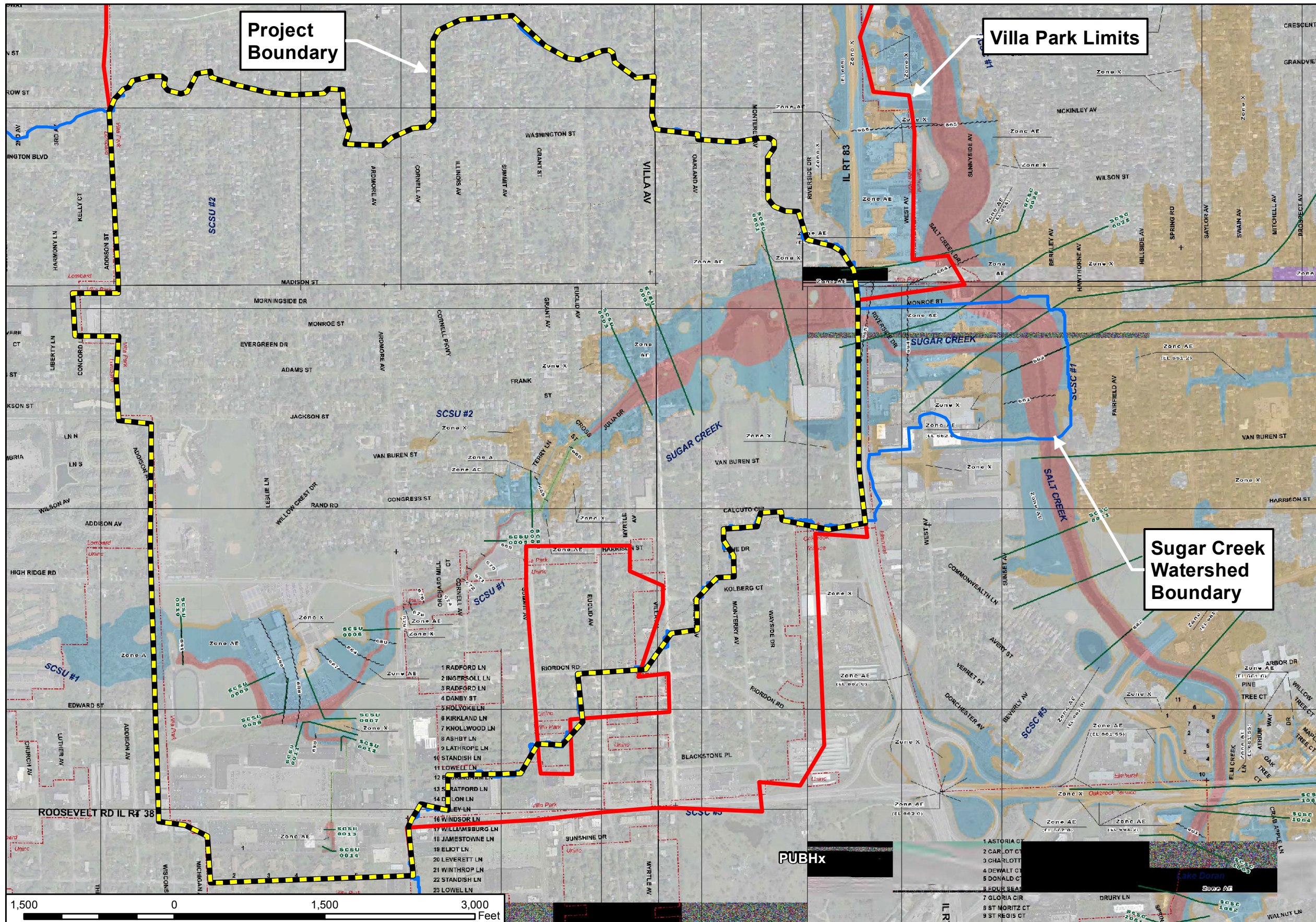
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 630.724.9202 fax
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 Visio, Vertere, Virtute... "The Vision To Transform With Excellence"

BASE LAYER:
 Base Layer
 (Year)

SITE:
**SUGAR CREEK WATERSHED STORM
 SEWER ANALYSIS
 VILLA PARK, IL**

TITLE:
**EXHIBIT VI
 FEMA FLOOD INSURANCE RATE MAP**

DATE:
 12/12/14
SCALE:
 See Scale Bar



Project Boundary

Villa Park Limits

Sugar Creek Watershed Boundary

DRFM

PANEL 0088 A

RFM
REGULATORY FLOOD MAP
DuPAGE COUNTY, ILLINOIS
and INCORPORATED AREAS

PANEL 0088 of QUADRANGLE
ELMHURST
(SEE MAP INDEX FOR PANEL LAYOUT)

CONTAINS:	COMMUNITY	CODE	FIPS #	TYPE
	ADDISON	1	170198	Village
	ELMHURST	15	170205	City
	LOMBARD	23	170212	Village
	Unincorporated DuPAGE	0	170197	County
	VILLA PARK	30	170217	Village

ALSO PORTIONS OF
PANELS:
0088, 0089, 0093,
0176, 0177

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER:
17043C0088 A
EFFECTIVE DATE:
July 7, 2010

Federal Emergency Management Agency



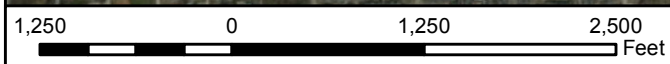
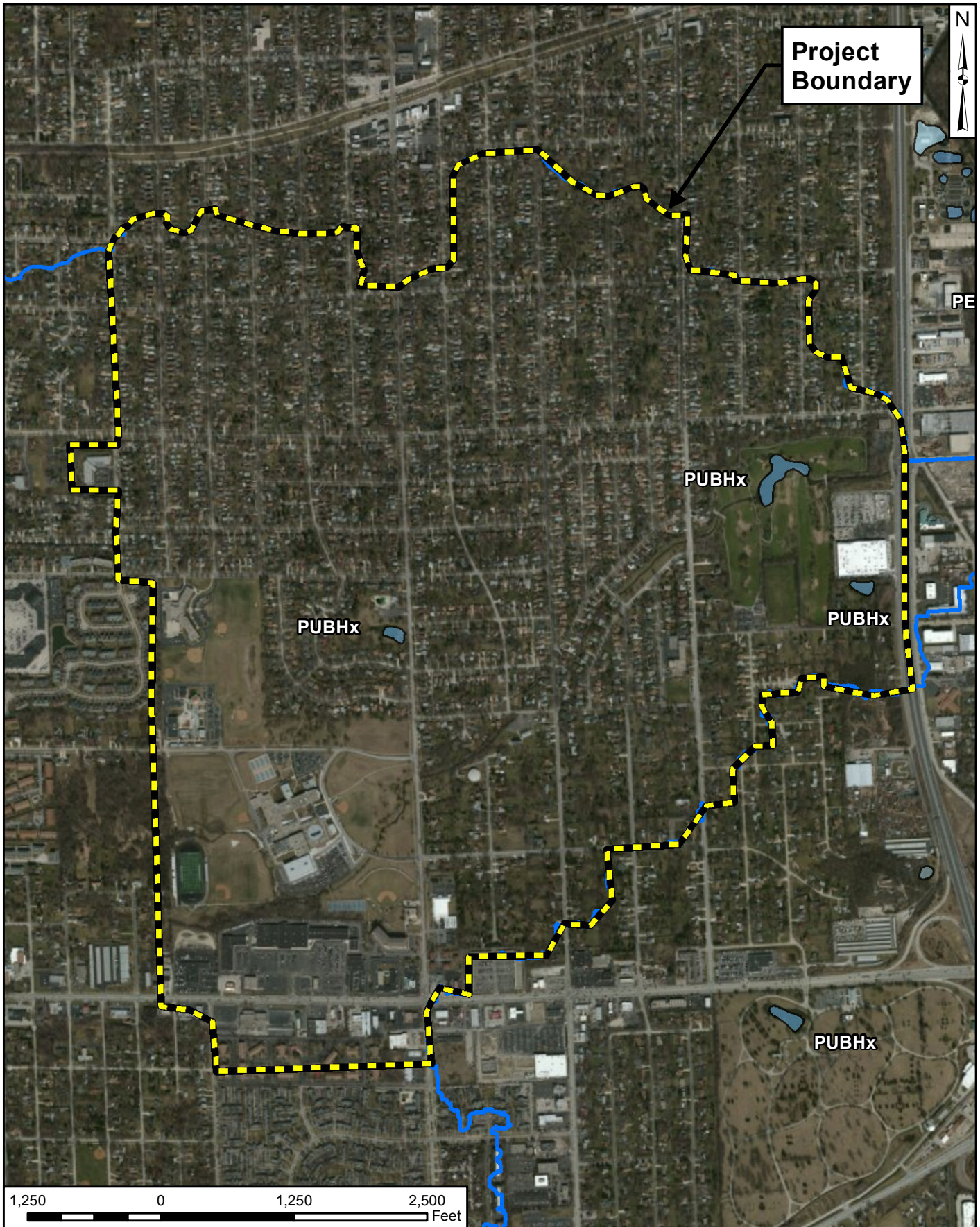
V3
V3 Companies, Ltd.
7325 Janes Avenue
Woodridge, Illinois 60517
630.724.9200 phone
630.724.9202 fax
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BASE LAYER:
Base Layer
(Year)

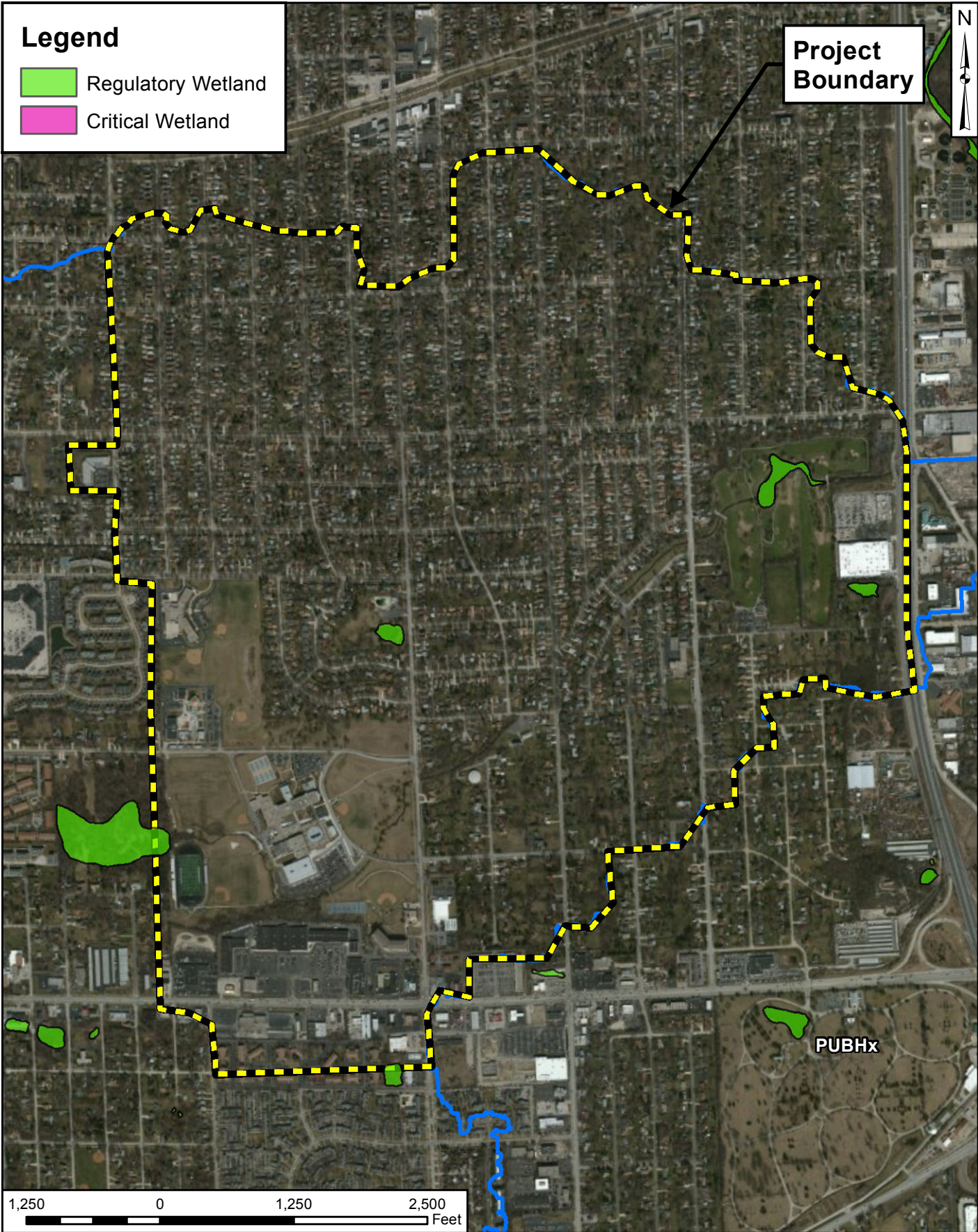
SITE:
**SUGAR CREEK WATERSHED STORM
SEWER ANALYSIS
VILLA PARK, IL**

TITLE:
**EXHIBIT VII
DUPAGE COUNTY REGULATORY FLOOD MAP**

DATE:
12/12/14
SCALE:
See Scale Bar



 <p>V3 Companies, Ltd. 7325 Janes Avenue Woodridge, Illinois 60517 630.724.9200 phone 630.724.9202 fax www.v3co.com</p> <p><small>Visio, Vertere, Virtute... "The Vision To Transform with Excellence"</small></p>	<p>TITLE: EXHIBIT VIII NATIONAL WETLANDS INVENTORY MAP</p>	<p>BASE LAYER: DigitalGlobe</p>
	<p>SITE: SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL</p>	<p>SCALE: See Scale Bar</p>




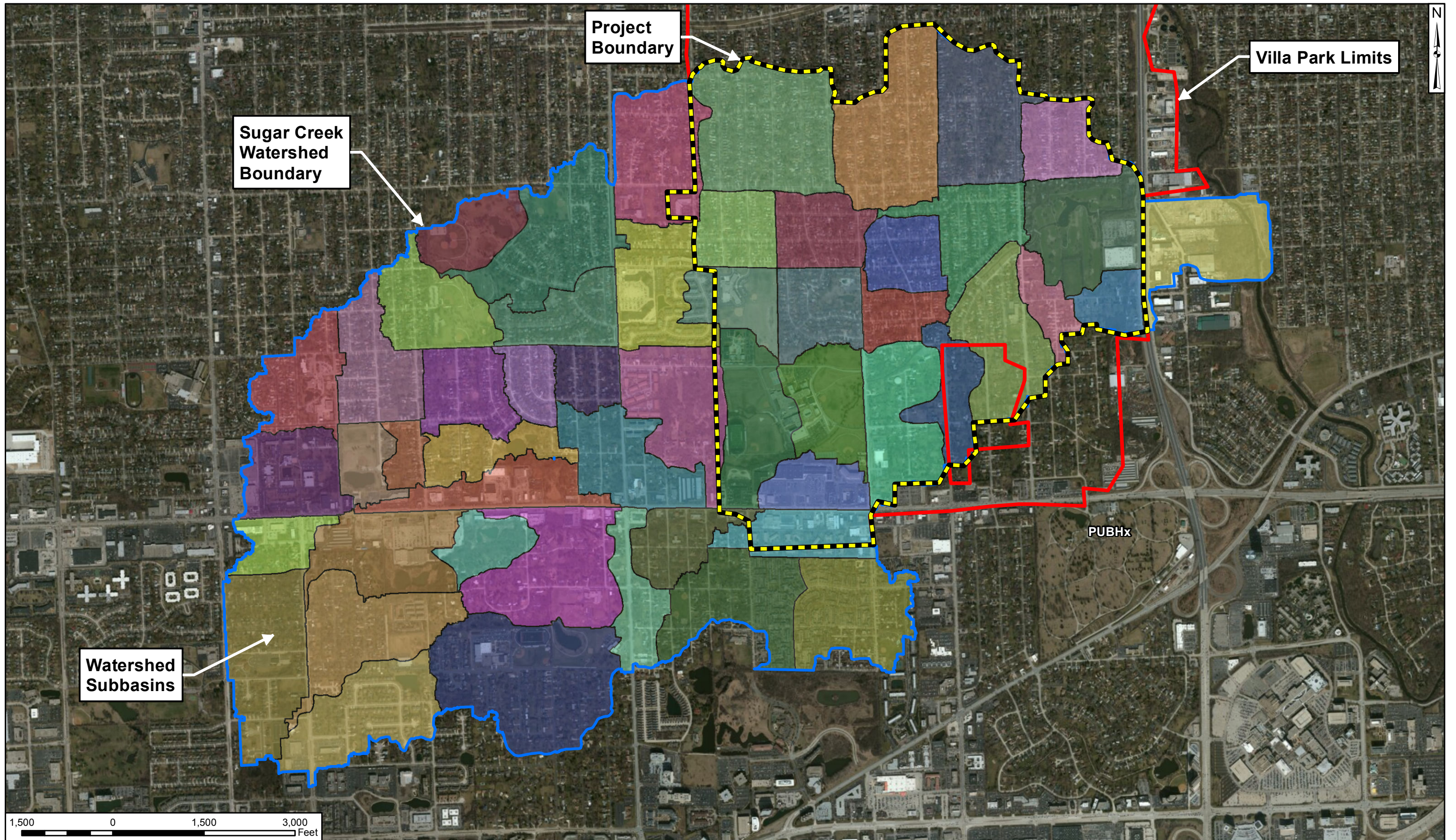
Legend

- Regulatory Wetland
- Critical Wetland

Project Boundary



 <p>V3 Companies, Ltd. 7325 Janes Avenue Woodridge, Illinois 60517 630.724.9200 phone 630.724.9202 fax www.v3co.com</p> <p><small>Visio, Vertere, Virtute...<i>The Vision To Transform with Excellence</i></small></p>	<p>TITLE: EXHIBIT IX DUPAGE COUNTY ADID WETLANDS MAP</p>	<p>BASE LAYER: DigitalGlobe</p>
	<p>SITE: SUGAR CREEK WATERSHED STORM SEWER ANALYSIS -- VILLA PARK, IL</p>	<p>SCALE: See Scale Bar</p>



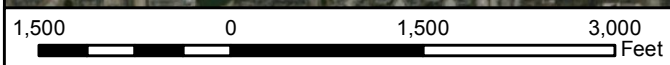
Project Boundary


Villa Park Limits

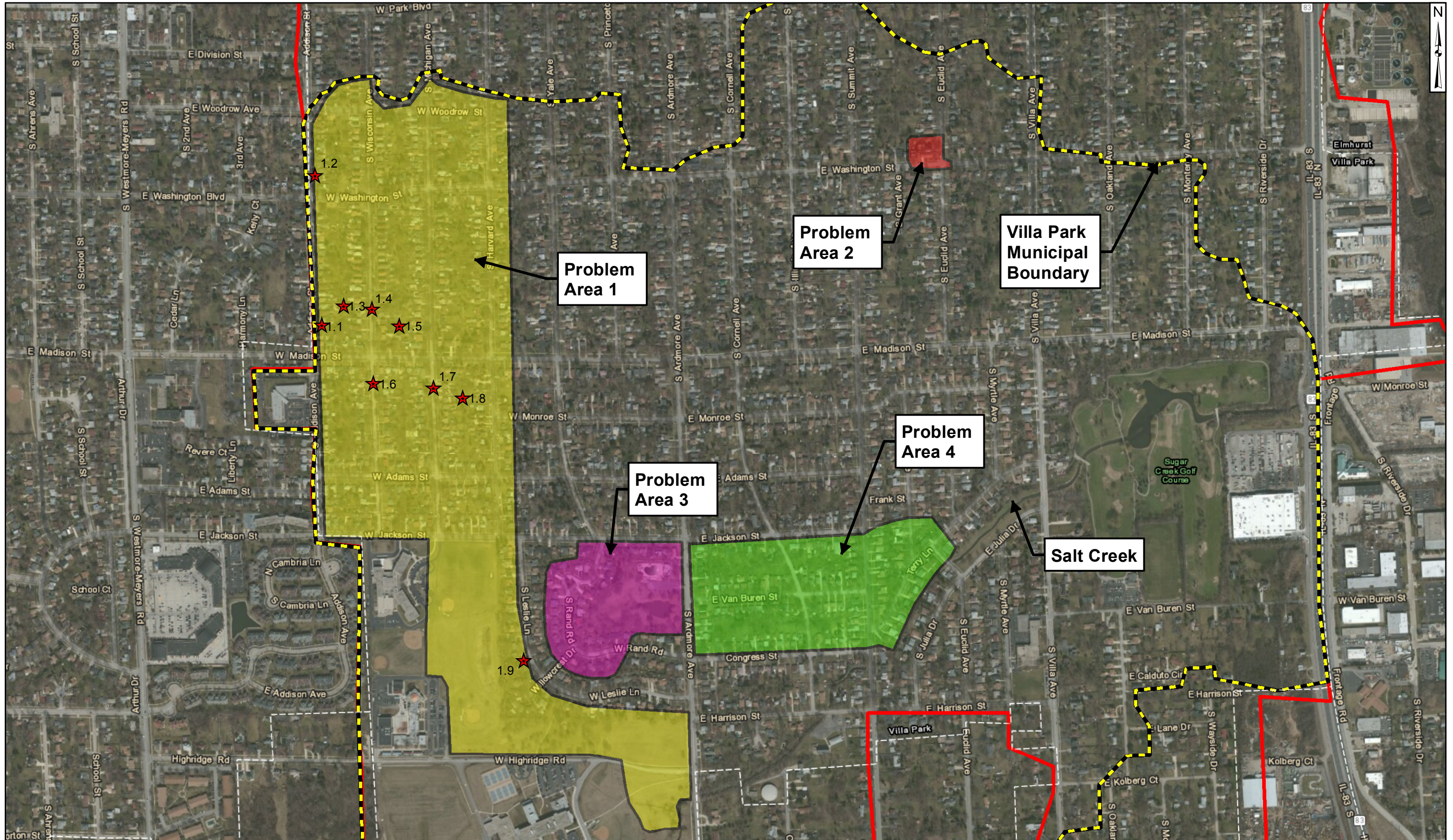
Sugar Creek Watershed Boundary

Watershed Subbasins

PUBHx



 <p>V3 Companies, Ltd. 7325 Janes Avenue Woodridge, Illinois 60517 630.724.9200 phone 630.724.9202 fax www.v3co.com</p>	<p>BASE LAYER: Base Layer (Year)</p>	<p>SITE: SUGAR CREEK WATERSHED STORM SEWER ANALYSIS VILLA PARK, IL</p>	<p>TITLE: EXHIBIT X WATERSHED MAP</p>	<p>DATE: 12/12/14</p> <p>SCALE: See Scale Bar</p>
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V
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BASE LAYER:
 Base Layer
 (Year)

SITE:
 SUGAR CREEK WATERSHED STORM
 SEWER ANALYSIS
 VILLA PARK, IL

TITLE:
**EXHIBIT XI
 PROBLEM AREA MAP**

DATE:
 12/22/14
 SCALE:
 See Scale Bar

Appendix A – Calculation Methodology



Calculation Methodology

A written description of the calculation methodology follows.

Sugar Creek Watershed

All of the problem areas are located within the Sugar Creek Watershed and were analyzed using XP-SWMM for both hydrology and hydraulics. XP-SWMM is a dynamic storm water management model that computes runoff hydrographs and routes the hydrographs through a series of pipes and/or ditches. The dynamic program models storm flow for the duration of an entire storm event (and not just for a single point in time, representing the peak condition, as is typical for static models.) The program allows the computed runoff to “choose” its route based on water elevation and remaining capacity in the conveyance system. For example, runoff entering a manhole would first flow downstream through a pipe, but once the pipe reaches capacity and surcharges, any additional inflow would surcharge and flow downstream via an overland ditch or conveyance path.

Hydrologic Analysis

Hydrologic components were modeled in XP-SWMM using the SCS method, which uses unit hydrograph development as the basis for establishing the sub-basin hydrographs.

XP-SWMM hydrograph modeling required the following input:

- Tributary Sub basin areas, which were delineated using the 1-foot topo (with LIDAR points) and supplemented by the DuPage County 2-foot contour mapping;
- Runoff Curve Numbers, which were established using standard SCS methodology based on a review of aerial photos in conjunction with soils maps;
- Times of Concentration, which were established using standard SCS methodology based on the 1-foot topographic information provided by Villa Park and aeriels to determine land use for the flow path;
- Rainfall distributions based on the Huff distribution as published in Illinois Bulletin 71;
- Rainfall depths based on Illinois Bulletin 70, Northeast Illinois.
- Developments within the watershed that are more recent and have evidence of a detention basin were assumed to be designed according to current DuPage County Stormwater regulations.

Flow rates and elevations were determined at key locations in the watershed. A critical duration analysis was performed. It was determined that the 24-hour and 2-hour storms produced the peak elevations and flows, respectively, along at a majority of the locations.

Hydraulic Analysis

Hydraulic components were modeled in XP-SWMM based on user input taken from the survey of the storm sewer system and overland flow paths within the watershed. Storm sewers and overland flow paths / ditches were input so that the XP-SWMM model could identify the flow route of least resistance, and to determine locations where flooding is expected to occur.



Appendix B – Engineer’s Opinions of Probable Construction Cost



Client: Vydas Juskelis
Village of Villa Park
20 South Ardmore Avenue
Villa Park, IL 60181-2696

Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
Storm Sewer Study

Date of Plans: N/A
Revision Date: N/A
Date of Estimate: 4/9/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

Sugar Creek			
Alt 1a	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1a	\$	31,000.00
Alt 1b	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1b	\$	4,307,000.00
Alt 1c	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c	\$	6,744,000.00
Alt 1d	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d	\$	8,381,000.00
Alt 2a	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 2a	\$	21,000.00
Alt 3a	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 3a	\$	742,000.00
Alt 3b	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 3b	\$	665,000.00
Alt 3c	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 3c	\$	865,000.00
Alt 4a	SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 4a	\$	1,856,000.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1a

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	6.000	EACH	\$ 100.00	\$ 600.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	50.000	LF	\$ 10.00	\$ 500.00
	1.22 Asphalt Pavement Removal (Full Depth)	20.000	SY	\$ 15.75	\$ 315.00
1.30	STORM SEWER INSTALLATION				
	1.31 Install 15" Storm Sewer	60.000	LF	\$ 40.00	\$ 2,400.00
	1.32 Install Storm Inlets	6.000	EACH	\$ 2,500.00	\$ 15,000.00
	1.33 Sewer Spoil Removal	5.000	CY	\$ 35.00	\$ 175.00
	1.34 Trench Backfill	5.000	CY	\$ 28.00	\$ 140.00
	1.35 Install High Capacity Grates on Existing Inlets	4.000	EACH	\$ 250.00	\$ 1,000.00
1.40	PAVING & RESTORATION				
	1.41 Install Aggregate Base Course (10")	20.000	SY	\$ 10.50	\$ 210.00
	1.42 Install Bituminous Binder Course (4.0")	5.000	TON	\$ 90.00	\$ 450.00
	1.43 Install Bituminous Surface Course (2.50")	5.000	TON	\$ 100.00	\$ 500.00
	1.44 Parkway Restoration	20.000	SY	\$ 4.00	\$ 80.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	50.000	LF	\$ 20.00	\$ 1,000.00

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	\$ 22,000.00
	SUBTOTAL:	\$ 22,000.00
	CONTINGENCY (20%):	\$ 4,400.00
	CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 26,000.00
	DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 5,200.00
	CONCEPTUAL EOPCC TOTAL	\$ 31,000.00

Notes:

- 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

- 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1b

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@inwillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	6.000	EACH	\$ 100.00	\$ 600.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	50.000	LF	\$ 10.00	\$ 500.00
	1.22 Asphalt Pavement Removal (Full Depth)	20.000	SY	\$ 15.75	\$ 315.00
1.30	STORM SEWER INSTALLATION				
	1.31 Install 15" Storm Sewer	60.000	LF	\$ 40.00	\$ 2,400.00
	1.32 Install Storm Inlets	6.000	EACH	\$ 2,500.00	\$ 15,000.00
	1.33 Sewer Spoil Removal	5.000	CY	\$ 35.00	\$ 175.00
	1.34 Trench Backfill	5.000	CY	\$ 28.00	\$ 140.00
	1.35 Install High Capacity Grates on Existing Inlets	4.000	EACH	\$ 250.00	\$ 1,000.00
1.40	PAVING & RESTORATION				
	1.41 Install Aggregate Base Course (10")	20.000	SY	\$ 10.50	\$ 210.00
	1.42 Install Bituminous Binder Course (4.0")	5.000	TON	\$ 90.00	\$ 450.00
	1.43 Install Bituminous Surface Course (2.50")	5.000	TON	\$ 100.00	\$ 500.00
	1.44 Parkway Restoration	20.000	SY	\$ 4.00	\$ 80.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	50.000	LF	\$ 20.00	\$ 1,000.00

2.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
	2.11 Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
	2.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	2.13 Tree Trunk Protection	3.000	EACH	\$ 225.00	\$ 675.00
	2.14 Tree Protection Fence	90.000	LF	\$ 5.00	\$ 450.00
2.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	250.000	LF	\$ 3.25	\$ 812.50
	1.22 Asphalt Pavement Removal (Full Depth)	404.000	SY	\$ 15.75	\$ 6,363.00
	1.23 Asphalt Pavement Removal (2.5" Mill)	305.000	SY	\$ 6.00	\$ 1,830.00
2.30	STORM SEWER INSTALLATION				
	2.31 Install 54" Storm Sewer	250.000	LF	\$ 120.00	\$ 30,000.00
	2.32 Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
	2.33 Sewer Spoil Removal	1,225.000	CY	\$ 35.00	\$ 42,875.00
	2.34 Trench Backfill	900.000	CY	\$ 28.00	\$ 25,200.00
2.40	UTILITY RE-CONNECTION				
	2.41 Utility Service Re-connection	6.000	LSUM	\$ 2,000.00	\$ 12,000.00
2.50	PAVING & RESTORATION				
	2.51 Install Aggregate Base Course (10")	335.000	SY	\$ 10.50	\$ 3,517.50
	2.52 Install Bituminous Binder Course (4.0")	80.000	TON	\$ 90.00	\$ 7,200.00
	2.53 Install Bituminous Surface Course (2.50")	85.000	TON	\$ 100.00	\$ 8,500.00
	2.54 Parkway Restoration	140.000	SY	\$ 4.00	\$ 560.00
	2.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	250.000	LF	\$ 20.00	\$ 5,000.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1b

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@inwillpark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

3.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10	EROSION CONTROL				
3.11	Inlet Sediment Traps	3.000	EACH	\$ 100.00	\$ 300.00
3.12	Staging Area	20.000	SY	\$ 25.00	\$ 500.00
3.13	Tree Trunk Protection	9.000	EACH	\$ 225.00	\$ 2,025.00
3.14	Tree Protection Fence	270.000	LF	\$ 5.00	\$ 1,350.00
3.20	DEMOLITION				
1.21	Combination Curb & Gutter Removal	900.000	LF	\$ 3.25	\$ 2,925.00
1.22	Asphalt Pavement Removal (Full Depth)	1,200.000	SY	\$ 15.75	\$ 18,900.00
1.23	Asphalt Pavement Removal (2.5" Mill)	500.000	SY	\$ 6.00	\$ 3,000.00
3.30	STORM SEWER INSTALLATION				
3.31	Install 54" Storm Sewer	900.000	LF	\$ 120.00	\$ 108,000.00
3.32	Install Storm Manholes (+/- Every 400 LF)	3.000	EACH	\$ 3,500.00	\$ 10,500.00
3.33	Sewer Spoil Removal	4,400.000	CY	\$ 35.00	\$ 154,000.00
3.34	Trench Backfill	3,235.000	CY	\$ 28.00	\$ 90,580.00
3.40	UTILITY RE-CONNECTION				
3.41	Utility Service Re-connection	10.000	LSUM	\$ 2,000.00	\$ 20,000.00
3.50	PAVING & RESTORATION				
3.51	Install Aggregate Base Course (10")	1,200.000	SY	\$ 10.50	\$ 12,600.00
3.52	Install Bituminous Binder Course (4.0")	275.000	TON	\$ 90.00	\$ 24,750.00
3.53	Install Bituminous Surface Course (2.50")	300.000	TON	\$ 100.00	\$ 30,000.00
3.54	Parkway Restoration	490.000	SY	\$ 4.00	\$ 1,960.00
3.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	900.000	LF	\$ 20.00	\$ 18,000.00

4.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	EROSION CONTROL				
4.11	Inlet Sediment Traps	5.000	EACH	\$ 100.00	\$ 500.00
4.12	Staging Area	20.000	SY	\$ 25.00	\$ 500.00
4.13	Tree Trunk Protection	14.000	EACH	\$ 225.00	\$ 3,150.00
4.14	Tree Protection Fence	420.000	LF	\$ 5.00	\$ 2,100.00
4.20	DEMOLITION				
1.21	Combination Curb & Gutter Removal	1,370.000	LF	\$ 3.25	\$ 4,452.50
1.22	Asphalt Pavement Removal (Full Depth)	1,830.000	SY	\$ 15.75	\$ 28,822.50
1.23	Asphalt Pavement Removal (2.5" Mill)	770.000	SY	\$ 6.00	\$ 4,620.00
4.30	STORM SEWER INSTALLATION				
4.31	Install 54" Storm Sewer	1,370.000	LF	\$ 120.00	\$ 164,400.00
4.32	Install Storm Manholes (+/- Every 400 LF)	4.000	EACH	\$ 3,500.00	\$ 14,000.00
4.33	Sewer Spoil Removal	6,700.000	CY	\$ 35.00	\$ 234,500.00
4.34	Trench Backfill	4,920.000	CY	\$ 28.00	\$ 137,760.00
4.40	UTILITY RE-CONNECTION				
4.41	Utility Service Re-connection	15.000	LSUM	\$ 2,000.00	\$ 30,000.00
4.50	PAVING & RESTORATION				
4.51	Install Aggregate Base Course (10")	1,830.000	SY	\$ 10.50	\$ 19,215.00
4.52	Install Bituminous Binder Course (4.0")	415.000	TON	\$ 90.00	\$ 37,350.00
4.53	Install Bituminous Surface Course (2.50")	455.000	TON	\$ 100.00	\$ 45,500.00
4.54	Parkway Restoration	745.000	SY	\$ 4.00	\$ 2,980.00
4.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	1,370.000	LF	\$ 20.00	\$ 27,400.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1b

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@in villapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

5.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Jackson)	QUANTITY	UNIT	UNIT PRICE	TOTAL
5.10	EROSION CONTROL				
5.11	Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
5.12	Staging Area	20.000	SY	\$ 25.00	\$ 500.00
5.13	Tree Trunk Protection	4.000	EACH	\$ 225.00	\$ 900.00
5.14	Tree Protection Fence	120.000	LF	\$ 5.00	\$ 600.00
5.20	DEMOLITION				
1.21	Combination Curb & Gutter Removal	350.000	LF	\$ 3.25	\$ 1,137.50
1.22	Asphalt Pavement Removal (Full Depth)	470.000	SY	\$ 15.75	\$ 7,402.50
1.23	Asphalt Pavement Removal (2.5" Mill)	200.000	SY	\$ 6.00	\$ 1,200.00
5.30	STORM SEWER INSTALLATION				
5.31	Install 54" Storm Sewer	350.000	LF	\$ 120.00	\$ 42,000.00
5.32	Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
5.33	Sewer Spoil Removal	1,715.000	CY	\$ 35.00	\$ 60,025.00
5.34	Trench Backfill	1,260.000	CY	\$ 28.00	\$ 35,280.00
5.40	PAVING & RESTORATION				
5.41	Install Aggregate Base Course (10")	470.000	SY	\$ 10.50	\$ 4,935.00
5.42	Install Bituminous Binder Course (4.0")	110.000	TON	\$ 90.00	\$ 9,900.00
5.43	Install Bituminous Surface Course (2.50")	120.000	TON	\$ 100.00	\$ 12,000.00
5.44	Parkway Restoration	195.000	SY	\$ 4.00	\$ 780.00
5.45	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	350.000	LF	\$ 20.00	\$ 7,000.00

6.00	CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)	QUANTITY	UNIT	UNIT PRICE	TOTAL
6.10	EROSION CONTROL				
6.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
6.12	Silt Fence Installation (Standard No Wire)	1,260.000	LF	\$ 3.00	\$ 3,780.00
6.13	Erosion Control Blanket (NAG S75BN)	2,000.000	SY	\$ 2.15	\$ 4,300.00
6.20	STORM SEWER INSTALLATION				
6.21	Install 54" Storm Sewer	630.000	LF	\$ 120.00	\$ 75,600.00
6.22	Install Storm Manholes (+/- Every 400 LF)	2.000	EACH	\$ 3,500.00	\$ 7,000.00
6.23	Sewer Spoil Removal	540.000	CY	\$ 35.00	\$ 18,900.00
6.30	RESTORATION				
6.31	Turf Seeding W/ 90 day Maintenance	2,000.000	SY	\$ 1.85	\$ 3,700.00

7.00	CONCEPTUAL POND EXPANSION (JACKSON MS)	QUANTITY	UNIT	UNIT PRICE	TOTAL
7.10	EROSION CONTROL				
7.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
7.12	Silt Fence Installation (Standard No Wire)	5,000.000	LF	\$ 3.00	\$ 15,000.00
7.13	Erosion Control Blanket (NAG S150BN)	8,500.000	SY	\$ 2.65	\$ 22,525.00
7.20	EARTH EXCAVATION				
7.21	Topsoil Excavation & Placement	2,500.000	CY	\$ 12.00	\$ 30,000.00
7.22	Earth Excavation to Off-Site Spoil Disposal	17,000.000	CY	\$ 35.00	\$ 595,000.00
7.23	Earth Excavation to On-Site Spoil Disposal	33,000.000	CY	\$ 12.00	\$ 396,000.00
7.23	CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
7.24	Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
7.30	RESTORATION				
7.31	Turf Seeding W/ 90 day Maintenance	17,500.000	SY	\$ 1.85	\$ 32,375.00
7.40	STORM SEWER INSTALLATION				
7.41	Install 12" Storm Sewer	415.000	LF	\$ 35.00	\$ 14,525.00
7.42	Install Storm Manholes	2.000	EACH	\$ 3,500.00	\$ 7,000.00
7.43	Sewer Spoil Removal	25.000	CY	\$ 35.00	\$ 875.00
7.44	Trench Backfill	50.000	CY	\$ 28.00	\$ 1,400.00
7.50	PAVING & RESTORATION				
7.51	Install Aggregate Base Course (10")	90.000	SY	\$ 10.50	\$ 945.00
7.52	Install Bituminous Binder Course (4.0")	20.000	TON	\$ 90.00	\$ 1,800.00
7.53	Install Bituminous Surface Course (2.50")	25.000	TON	\$ 100.00	\$ 2,500.00
7.54	Parkway Restoration	250.000	SY	\$ 4.00	\$ 1,000.00
7.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	40.000	LF	\$ 20.00	\$ 800.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1b

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

8.00	SCHOOL DISTRICT IMPROVEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
8.10	STORMWATER IMPROVEMENTS FOR SCHOOLS				
8.11	Jackson Middle School	1.000	LSUM	\$ 100,000.00	\$ 100,000.00
8.12	Willowbrook High School	1.000	LSUM	\$ 100,000.00	\$ 100,000.00

9.00	MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
9.01	Maintenance of Traffic	1.000	LSUM	\$ 25,000.00	\$ 25,000.00
9.02	Mobilization	1.000	EACH	\$ 10,000.00	\$ 10,000.00

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)				\$ 22,000.00
2.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)				\$ 149,000.00
3.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)				\$ 499,000.00
4.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)				\$ 757,000.00
5.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Jackson)				\$ 187,000.00
6.00	CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)				\$ 117,000.00
7.00	CONCEPTUAL POND EXPANSION (JACKSON MS)				\$ 1,155,000.00
8.00	SCHOOL DISTRICT IMPROVEMENTS				\$ 200,000.00
9.00	MISCELLANEOUS				\$ 35,000.00
				SUBTOTAL:	\$ 3,121,000.00
				CONTINGENCY (15%)	\$ 468,000.00
				CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 3,589,000.00
				DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 718,000.00
				CONCEPTUAL EOPCC TOTAL	\$ 4,307,000.00

Notes:

- 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

- 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	6.000	EACH	\$ 100.00	\$ 600.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	50.000	LF	\$ 10.00	\$ 500.00
	1.22 Asphalt Pavement Removal (Full Depth)	20.000	SY	\$ 15.75	\$ 315.00
1.30	STORM SEWER INSTALLATION				
	1.31 Install 15" Storm Sewer	60.000	LF	\$ 40.00	\$ 2,400.00
	1.32 Install Storm Inlets	6.000	EACH	\$ 2,500.00	\$ 15,000.00
	1.33 Sewer Spoil Removal	5.000	CY	\$ 35.00	\$ 175.00
	1.34 Trench Backfill	5.000	CY	\$ 28.00	\$ 140.00
	1.35 Install High Capacity Grates on Existing Inlets	4.000	EACH	\$ 250.00	\$ 1,000.00
1.40	PAVING & RESTORATION				
	1.41 Install Aggregate Base Course (10")	20.000	SY	\$ 10.50	\$ 210.00
	1.42 Install Bituminous Binder Course (4.0")	5.000	TON	\$ 90.00	\$ 450.00
	1.43 Install Bituminous Surface Course (2.50")	5.000	TON	\$ 100.00	\$ 500.00
	1.44 Parkway Restoration	20.000	SY	\$ 4.00	\$ 80.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	50.000	LF	\$ 20.00	\$ 1,000.00

2.00	CONCEPTUAL STORM SEWER ESTIMATE (Increase Inlet Capacities at Various Locations and Read Yard Drains)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
	2.11 Inlet Sediment Traps	24.000	EACH	\$ 100.00	\$ 2,400.00
2.20	DEMOLITION				
	2.21 Combination Curb & Gutter Removal	240.000	LF	\$ 10.00	\$ 2,400.00
	2.22 Asphalt Pavement Removal (Full Depth)	130.000	SY	\$ 15.75	\$ 2,047.50
2.30	STORM SEWER INSTALLATION				
	2.31 Install 15" Storm Sewer	390.000	LF	\$ 40.00	\$ 15,600.00
	2.32 Install 24" Storm Sewer	590.000	LF	\$ 60.00	\$ 35,400.00
	2.33 Install 27" Storm Sewer	150.000	LF	\$ 70.00	\$ 10,500.00
	2.34 Install 30" Storm Sewer	80.000	LF	\$ 80.00	\$ 6,400.00
	2.35 Install Storm Inlets	24.000	EACH	\$ 2,500.00	\$ 60,000.00
	2.36 Sewer Spoil Removal	30.000	CY	\$ 35.00	\$ 1,050.00
	2.37 Trench Backfill	30.000	CY	\$ 28.00	\$ 840.00
	2.38 Install High Capacity Grates on Existing Inlets	24.000	EACH	\$ 250.00	\$ 6,000.00
2.40	PAVING & RESTORATION				
	1.41 Install Aggregate Base Course (10")	130.000	SY	\$ 10.50	\$ 1,365.00
	1.42 Install Bituminous Binder Course (4.0")	18.000	TON	\$ 90.00	\$ 1,620.00
	1.43 Install Bituminous Surface Course (2.50")	20.000	TON	\$ 100.00	\$ 2,000.00
	1.44 Parkway Restoration	96.000	SY	\$ 4.00	\$ 384.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	240.000	LF	\$ 20.00	\$ 4,800.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

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 Village of Villa Park
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Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

3.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10	EROSION CONTROL				
	3.11 Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
	3.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	3.13 Tree Trunk Protection	3.000	EACH	\$ 225.00	\$ 675.00
	3.14 Tree Protection Fence	90.000	LF	\$ 5.00	\$ 450.00
3.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	250.000	LF	\$ 3.25	\$ 812.50
	1.22 Asphalt Pavement Removal (Full Depth)	335.000	SY	\$ 15.75	\$ 5,276.25
	1.23 Asphalt Pavement Removal (2.5" Mill)	140.000	SY	\$ 6.00	\$ 840.00
3.30	STORM SEWER INSTALLATION				
	3.31 Install 60" Storm Sewer	250.000	LF	\$ 135.00	\$ 33,750.00
	3.32 Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
	3.33 Sewer Spoil Removal	1,225.000	CY	\$ 35.00	\$ 42,875.00
	3.34 Trench Backfill	850.000	CY	\$ 28.00	\$ 23,800.00
3.40	UTILITY RE-CONNECTION				
	3.41 Utility Service Re-connection	6.000	LSUM	\$ 2,000.00	\$ 12,000.00
3.50	PAVING & RESTORATION				
	3.51 Install Aggregate Base Course (10")	335.000	SY	\$ 10.50	\$ 3,517.50
	3.52 Install Bituminous Binder Course (4.0")	80.000	TON	\$ 90.00	\$ 7,200.00
	3.53 Install Bituminous Surface Course (2.50")	85.000	TON	\$ 100.00	\$ 8,500.00
	3.54 Parkway Restoration	140.000	SY	\$ 4.00	\$ 560.00
	3.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	250.000	LF	\$ 20.00	\$ 5,000.00

4.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Wisconsin)	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	EROSION CONTROL				
	4.11 Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
	4.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	4.13 Tree Trunk Protection	3.000	EACH	\$ 225.00	\$ 675.00
	4.14 Tree Protection Fence	90.000	LF	\$ 5.00	\$ 450.00
4.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	339.000	LF	\$ 3.25	\$ 1,101.75
	1.22 Asphalt Pavement Removal (Full Depth)	380.000	SY	\$ 15.75	\$ 5,985.00
	1.23 Asphalt Pavement Removal (2.5" Mill)	190.000	SY	\$ 6.00	\$ 1,140.00
4.30	STORM SEWER INSTALLATION				
	4.31 Install 42" Storm Sewer	339.000	LF	\$ 100.00	\$ 33,900.00
	4.32 Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
	4.33 Sewer Spoil Removal	1,385.000	CY	\$ 35.00	\$ 48,475.00
	4.34 Trench Backfill	1,080.000	CY	\$ 28.00	\$ 30,240.00
4.40	UTILITY RE-CONNECTION				
	4.41 Utility Service Re-connection	14.000	LSUM	\$ 2,000.00	\$ 28,000.00
4.50	PAVING & RESTORATION				
	4.51 Install Aggregate Base Course (10")	380.000	SY	\$ 10.50	\$ 3,990.00
	4.52 Install Bituminous Binder Course (4.0")	85.000	TON	\$ 90.00	\$ 7,650.00
	4.53 Install Bituminous Surface Course (2.50")	95.000	TON	\$ 100.00	\$ 9,500.00
	4.54 Parkway Restoration	155.000	SY	\$ 4.00	\$ 620.00
	4.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	339.000	LF	\$ 20.00	\$ 6,780.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

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Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

5.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
5.10	EROSION CONTROL				
	5.11 Inlet Sediment Traps	3.000	EACH	\$ 100.00	\$ 300.00
	5.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	5.13 Tree Trunk Protection	9.000	EACH	\$ 225.00	\$ 2,025.00
	5.14 Tree Protection Fence	270.000	LF	\$ 5.00	\$ 1,350.00
5.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	900.000	LF	\$ 3.25	\$ 2,925.00
	1.22 Asphalt Pavement Removal (Full Depth)	1,400.000	SY	\$ 15.75	\$ 22,050.00
	1.23 Asphalt Pavement Removal (2.5" Mill)	500.000	SY	\$ 6.00	\$ 3,000.00
5.30	STORM SEWER INSTALLATION				
	5.31 Install 72" Storm Sewer	900.000	LF	\$ 160.00	\$ 144,000.00
	5.32 Install Storm Manholes (+/- Every 400 LF)	3.000	EACH	\$ 3,500.00	\$ 10,500.00
	5.33 Sewer Spoil Removal	5,135.000	CY	\$ 35.00	\$ 179,725.00
	5.34 Trench Backfill	3,325.000	CY	\$ 28.00	\$ 93,100.00
5.40	UTILITY RE-CONNECTION				
	5.41 Utility Service Re-connection	10.000	LSUM	\$ 2,000.00	\$ 20,000.00
5.50	PAVING & RESTORATION				
	5.51 Install Aggregate Base Course (10")	1,400.000	SY	\$ 10.50	\$ 14,700.00
	5.52 Install Bituminous Binder Course (4.0")	320.000	TON	\$ 90.00	\$ 28,800.00
	5.53 Install Bituminous Surface Course (2.50")	350.000	TON	\$ 100.00	\$ 35,000.00
	5.54 Parkway Restoration	575.000	SY	\$ 4.00	\$ 2,300.00
	5.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	900.000	LF	\$ 20.00	\$ 18,000.00

6.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)	QUANTITY	UNIT	UNIT PRICE	TOTAL
6.10	EROSION CONTROL				
	6.11 Inlet Sediment Traps	5.000	EACH	\$ 100.00	\$ 500.00
	6.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	6.13 Tree Trunk Protection	14.000	EACH	\$ 225.00	\$ 3,150.00
	6.14 Tree Protection Fence	420.000	LF	\$ 5.00	\$ 2,100.00
6.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	1,370.000	LF	\$ 3.25	\$ 4,452.50
	1.22 Asphalt Pavement Removal (Full Depth)	2,135.000	SY	\$ 15.75	\$ 33,626.25
	1.23 Asphalt Pavement Removal (2.5" Mill)	770.000	SY	\$ 6.00	\$ 4,620.00
6.30	STORM SEWER INSTALLATION				
	6.31 Install 72" Storm Sewer	1,370.000	LF	\$ 160.00	\$ 219,200.00
	6.32 Install Storm Manholes (+/- Every 400 LF)	4.000	EACH	\$ 3,500.00	\$ 14,000.00
	6.33 Sewer Spoil Removal	7,815.000	CY	\$ 35.00	\$ 273,525.00
	6.34 Trench Backfill	5,060.000	CY	\$ 28.00	\$ 141,680.00
6.40	UTILITY RE-CONNECTION				
	6.41 Utility Service Re-connection	15.000	LSUM	\$ 2,000.00	\$ 30,000.00
6.50	PAVING & RESTORATION				
	6.51 Install Aggregate Base Course (10")	2,135.000	SY	\$ 10.50	\$ 22,417.50
	6.52 Install Bituminous Binder Course (4.0")	485.000	TON	\$ 90.00	\$ 43,650.00
	6.53 Install Bituminous Surface Course (2.50")	530.000	TON	\$ 100.00	\$ 53,000.00
	6.54 Parkway Restoration	870.000	SY	\$ 4.00	\$ 3,480.00
	6.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	1,370.000	LF	\$ 20.00	\$ 27,400.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

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 Village of Villa Park
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 Villa Park, IL 60181-2696
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Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

7.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Jackson)	QUANTITY	UNIT	UNIT PRICE	TOTAL
7.10	EROSION CONTROL				
	7.11 Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
	7.12 Staging Area	20.000	SY	\$ 25.00	\$ 500.00
	7.13 Tree Trunk Protection	4.000	EACH	\$ 225.00	\$ 900.00
	7.14 Tree Protection Fence	120.000	LF	\$ 5.00	\$ 600.00
7.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	350.000	LF	\$ 3.25	\$ 1,137.50
	1.22 Asphalt Pavement Removal (Full Depth)	545.000	SY	\$ 15.75	\$ 8,583.75
	1.23 Asphalt Pavement Removal (2.5" Mill)	200.000	SY	\$ 6.00	\$ 1,200.00
7.30	STORM SEWER INSTALLATION				
	7.31 Install 72" Storm Sewer	350.000	LF	\$ 160.00	\$ 56,000.00
	7.32 Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
	7.33 Sewer Spoil Removal	2,000.000	CY	\$ 35.00	\$ 70,000.00
	7.34 Trench Backfill	1,295.000	CY	\$ 28.00	\$ 36,260.00
7.40	PAVING & RESTORATION				
	7.41 Install Aggregate Base Course (10")	545.000	SY	\$ 10.50	\$ 5,722.50
	7.42 Install Bituminous Binder Course (4.0")	125.000	TON	\$ 90.00	\$ 11,250.00
	7.43 Install Bituminous Surface Course (2.50")	135.000	TON	\$ 100.00	\$ 13,500.00
	7.44 Parkway Restoration	225.000	SY	\$ 4.00	\$ 900.00
	7.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	350.000	LF	\$ 20.00	\$ 7,000.00

8.00	CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)	QUANTITY	UNIT	UNIT PRICE	TOTAL
8.10	EROSION CONTROL				
	8.11 Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
	8.12 Silt Fence Installation (Standard No Wire)	1,260.000	LF	\$ 3.00	\$ 3,780.00
	8.13 Erosion Control Blanket (NAG S75BN)	2,000.000	SY	\$ 2.15	\$ 4,300.00
8.20	STORM SEWER INSTALLATION				
	8.21 Install 72" Storm Sewer	630.000	LF	\$ 160.00	\$ 100,800.00
	8.22 Install Storm Manholes (+/- Every 400 LF)	2.000	EACH	\$ 3,500.00	\$ 7,000.00
	8.23 Sewer Spoil Removal	210.000	CY	\$ 35.00	\$ 7,350.00
8.30	RESTORATION				
	8.31 Turf Seeding W/ 90 day Maintenance	2,000.000	SY	\$ 1.85	\$ 3,700.00

9.00	CONCEPTUAL SWALE CONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
9.10	EROSION CONTROL				
	9.11 Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
	9.12 Silt Fence Installation (Standard No Wire)	3,200.000	LF	\$ 3.00	\$ 9,600.00
	9.13 Erosion Control Blanket (NAG S150BN)	4,500.000	SY	\$ 2.65	\$ 11,925.00
9.20	EARTH EXCAVATION				
	9.21 Topsoil Excavation & Placement	700.000	CY	\$ 12.00	\$ 8,400.00
	9.22 Earth Excavation to On-Site Spoil Disposal	2,400.000	CY	\$ 9.00	\$ 21,600.00
9.30	RESTORATION				
	9.31 Turf Seeding W/ 90 day Maintenance	4,500.000	SY	\$ 1.85	\$ 8,325.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

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Job Name: Sugar Creek
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Date of Plans: N/A
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ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

10.00	CONCEPTUAL POND EXPANSION (JACKSON MS)	QUANTITY	UNIT	UNIT PRICE	TOTAL
10.10	EROSION CONTROL				
10.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
10.12	Silt Fence Installation (Standard No Wire)	5,000.000	LF	\$ 3.00	\$ 15,000.00
10.13	Erosion Control Blanket (NAG S150BN)	8,500.000	SY	\$ 2.65	\$ 22,525.00
10.20	EARTH EXCAVATION				
10.21	Topsoil Excavation & Placement	2,500.000	CY	\$ 12.00	\$ 30,000.00
10.22	Earth Excavation to Off-Site Spoil Disposal	22,000.000	CY	\$ 35.00	\$ 770,000.00
10.23	Earth Excavation to On-Site Spoil Disposal	36,500.000	CY	\$ 12.00	\$ 438,000.00
10.23	CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
10.24	Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
10.30	RESTORATION				
10.31	Turf Seeding W/ 90 day Maintenance	17,500.000	SY	\$ 1.85	\$ 32,375.00
10.40	STORM SEWER INSTALLATION				
10.41	Install 12" Storm Sewer	415.000	LF	\$ 35.00	\$ 14,525.00
10.42	Install Storm Manholes	2.000	EACH	\$ 3,500.00	\$ 7,000.00
10.43	Sewer Spoil Removal	255.000	CY	\$ 35.00	\$ 8,925.00
10.44	Trench Backfill	230.000	CY	\$ 28.00	\$ 6,440.00
10.50	PAVING & RESTORATION				
10.51	Install Aggregate Base Course (10")	90.000	SY	\$ 10.50	\$ 945.00
10.52	Install Bituminous Binder Course (4.0")	20.000	TON	\$ 90.00	\$ 1,800.00
10.53	Install Bituminous Surface Course (2.50")	25.000	TON	\$ 100.00	\$ 2,500.00
10.54	Parkway Restoration	365.000	SY	\$ 4.00	\$ 1,460.00
10.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	40.000	LF	\$ 20.00	\$ 800.00

11.00	CONCEPTUAL POND EXPANSION (WILLOWBROOK)	QUANTITY	UNIT	UNIT PRICE	TOTAL
11.10	EROSION CONTROL				
11.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
11.12	Silt Fence Installation (Standard No Wire)	5,000.000	LF	\$ 3.00	\$ 15,000.00
11.13	Erosion Control Blanket (NAG S150BN)	9,000.000	SY	\$ 2.65	\$ 23,850.00
11.20	EARTH EXCAVATION				
11.21	Topsoil Excavation & Placement	1,500.000	CY	\$ 12.00	\$ 18,000.00
11.22	Earth Excavation to Off-Site Spoil Disposal	22,280.000	CY	\$ 35.00	\$ 779,800.00
11.23	CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
11.24	Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
11.30	RESTORATION				
11.31	Turf Seeding W/ 90 day Maintenance	9,000.000	SY	\$ 1.85	\$ 16,650.00

12.00	SCHOOL DISTRICT IMPROVEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
12.10	STORMWATER IMPROVEMENTS FOR SCHOOLS				
12.11	Jackson Middle School	1.000	LSUM	\$ 100,000.00	\$ 100,000.00
12.12	Willowbrook High School	1.000	LSUM	\$ 100,000.00	\$ 100,000.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1c

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ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

13.00 MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
13.01 Maintenance of Traffic	1.000	LSUM	\$ 30,000.00	\$ 30,000.00
13.02 Mobilization	1.000	EACH	\$ 10,000.00	\$ 10,000.00

1.00 CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)				\$ 22,000.00
2.00 CONCEPTUAL STORM SEWER ESTIMATE (Increase Inlet Capacities at Various Locations and Read Yard)				\$ 153,000.00
3.00 CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)				\$ 149,000.00
4.00 CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Wisconsin)				\$ 183,000.00
5.00 CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)				\$ 578,000.00
6.00 CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)				\$ 877,000.00
7.00 CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Jackson)				\$ 217,000.00
8.00 CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)				\$ 131,000.00
9.00 CONCEPTUAL SWALE CONSTRUCTION				\$ 64,000.00
10.00 CONCEPTUAL POND EXPANSION (JACKSON MS)				\$ 1,386,000.00
11.00 CONCEPTUAL POND EXPANSION (WILLOWBROOK)				\$ 887,000.00
12.00 SCHOOL DISTRICT IMPROVEMENTS				\$ 200,000.00
13.00 MISCELLANEOUS				\$ 40,000.00
			SUBTOTAL:	\$ 4,887,000.00
			CONTINGENCY (15%):	\$ 733,000.00
			CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 5,620,000.00
			DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 1,124,000.00
			CONCEPTUAL EOPCC TOTAL	\$ 6,744,000.00

Notes:
 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:
 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696

Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study

Date of Plans: N/A

Revision Date: 4/9/2015

Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	6.000	EACH	\$ 100.00	\$ 600.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	50.000	LF	\$ 10.00	\$ 500.00
	1.22 Asphalt Pavement Removal (Full Depth)	20.000	SY	\$ 15.75	\$ 315.00
1.30	STORM SEWER INSTALLATION				
	1.31 Install 15" Storm Sewer	60.000	LF	\$ 40.00	\$ 2,400.00
	1.32 Install Storm Inlets	6.000	EACH	\$ 2,500.00	\$ 15,000.00
	1.33 Sewer Spoil Removal	5.000	CY	\$ 35.00	\$ 175.00
	1.34 Trench Backfill	5.000	CY	\$ 28.00	\$ 140.00
	1.35 Install High Capacity Grates on Existing Inlets	4.000	EACH	\$ 250.00	\$ 1,000.00
1.40	PAVING & RESTORATION				
	1.41 Install Aggregate Base Course (10")	20.000	SY	\$ 10.50	\$ 210.00
	1.42 Install Bituminous Binder Course (4.0")	5.000	TON	\$ 90.00	\$ 450.00
	1.43 Install Bituminous Surface Course (2.50")	5.000	TON	\$ 100.00	\$ 500.00
	1.44 Parkway Restoration	24.000	SY	\$ 4.00	\$ 96.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	50.000	LF	\$ 20.00	\$ 1,000.00

2.00	CONCEPTUAL STORM SEWER ESTIMATE (Increase Inlet Capacities at Various Locations and Read Yard Drains)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
	2.11 Inlet Sediment Traps	24.000	EACH	\$ 100.00	\$ 2,400.00
2.20	DEMOLITION				
	2.21 Combination Curb & Gutter Removal	325.000	LF	\$ 10.00	\$ 3,250.00
	2.22 Asphalt Pavement Removal (Full Depth)	130.000	SY	\$ 15.75	\$ 2,047.50
2.30	STORM SEWER INSTALLATION				
	2.31 Install 15" Storm Sewer	390.000	LF	\$ 40.00	\$ 15,600.00
	2.41 Install 18" Storm Sewer	200.000	LF	\$ 45.00	\$ 9,000.00
	2.42 Install 24" Storm Sewer	490.000	LF	\$ 60.00	\$ 29,400.00
	2.43 Install Storm Inlets	24.000	EACH	\$ 2,500.00	\$ 60,000.00
	2.44 Sewer Spoil Removal	36.000	CY	\$ 35.00	\$ 1,260.00
	2.45 Trench Backfill	36.000	CY	\$ 28.00	\$ 1,008.00
	2.46 Install High Capacity Grates on Existing Inlets	24.000	EACH	\$ 250.00	\$ 6,000.00
2.40	PAVING & RESTORATION				
	2.41 Install Aggregate Base Course (10")	110.000	SY	\$ 10.50	\$ 1,155.00
	2.42 Install Bituminous Binder Course (4.0")	25.000	TON	\$ 90.00	\$ 2,250.00
	1.43 Install Bituminous Surface Course (2.50")	30.000	TON	\$ 100.00	\$ 3,000.00
	1.44 Parkway Restoration	96.000	SY	\$ 4.00	\$ 384.00
	1.45 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	325.000	LF	\$ 20.00	\$ 6,500.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696

Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

3.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10	EROSION CONTROL				
	3.11 Inlet Sediment Traps	1.000	EACH	\$ 100.00	\$ 100.00
	3.12 Staging Area	4.000	SY	\$ 25.00	\$ 100.00
	3.13 Tree Trunk Protection	3.000	EACH	\$ 225.00	\$ 675.00
	3.14 Tree Protection Fence	90.000	LF	\$ 5.00	\$ 450.00
3.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	390.000	LF	\$ 3.25	\$ 1,267.50
	1.22 Asphalt Pavement Removal (Full Depth)	390.000	SY	\$ 15.75	\$ 6,142.50
	1.23 Asphalt Pavement Removal (2.5" Mill)	220.000	SY	\$ 6.00	\$ 1,320.00
3.30	STORM SEWER INSTALLATION				
	3.31 Install 36" Storm Sewer	390.000	LF	\$ 90.00	\$ 35,100.00
	3.32 Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
	3.33 Sewer Spoil Removal	1,430.000	CY	\$ 35.00	\$ 50,050.00
	3.34 Trench Backfill	575.000	CY	\$ 28.00	\$ 16,100.00
3.40	UTILITY RE-CONNECTION				
	3.41 Utility Service Re-connection	6.000	LSUM	\$ 2,000.00	\$ 12,000.00
3.50	PAVING & RESTORATION				
	3.51 Install Aggregate Base Course (10")	390.000	SY	\$ 10.50	\$ 4,095.00
	3.52 Install Bituminous Binder Course (4.0")	90.000	TON	\$ 90.00	\$ 8,100.00
	3.53 Install Bituminous Surface Course (2.50")	100.000	TON	\$ 100.00	\$ 10,000.00
	3.54 Parkway Restoration	160.000	SY	\$ 4.00	\$ 640.00
	3.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	390.000	LF	\$ 20.00	\$ 7,800.00

4.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	EROSION CONTROL				
	4.11 Inlet Sediment Traps	3.000	EACH	\$ 100.00	\$ 300.00
	4.12 Staging Area	16.000	SY	\$ 25.00	\$ 400.00
	4.13 Tree Trunk Protection	9.000	EACH	\$ 225.00	\$ 2,025.00
	4.14 Tree Protection Fence	315.000	LF	\$ 5.00	\$ 1,575.00
4.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	1,117.000	LF	\$ 3.25	\$ 3,630.25
	1.22 Asphalt Pavement Removal (Full Depth)	1,120.000	SY	\$ 15.75	\$ 17,640.00
	1.23 Asphalt Pavement Removal (2.5" Mill)	630.000	SY	\$ 6.00	\$ 3,780.00
4.30	STORM SEWER INSTALLATION				
	4.31 Install 36" Storm Sewer	1,117.000	LF	\$ 90.00	\$ 100,530.00
	4.32 Install Storm Manholes (+/- Every 400 LF)	3.000	EACH	\$ 3,500.00	\$ 10,500.00
	4.33 Sewer Spoil Removal	4,100.000	CY	\$ 35.00	\$ 143,500.00
	4.34 Trench Backfill	1,645.000	CY	\$ 28.00	\$ 46,060.00
4.40	UTILITY RE-CONNECTION				
	4.41 Utility Service Re-connection	10.000	LSUM	\$ 2,000.00	\$ 20,000.00
4.50	PAVING & RESTORATION				
	4.51 Install Aggregate Base Course (10")	1,120.000	SY	\$ 10.50	\$ 11,760.00
	4.52 Install Bituminous Binder Course (4.0")	255.000	TON	\$ 90.00	\$ 22,950.00
	4.53 Install Bituminous Surface Course (2.50")	280.000	TON	\$ 100.00	\$ 28,000.00
	4.54 Parkway Restoration	460.000	SY	\$ 4.00	\$ 1,840.00
	4.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	1,117.000	LF	\$ 20.00	\$ 22,340.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@inwillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

5.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)	QUANTITY	UNIT	UNIT PRICE	TOTAL
5.10	EROSION CONTROL				
5.11	Inlet Sediment Traps	5.000	EACH	\$ 100.00	\$ 500.00
5.12	Staging Area	24.000	SY	\$ 25.00	\$ 600.00
5.13	Tree Trunk Protection	14.000	EACH	\$ 225.00	\$ 3,150.00
5.14	Tree Protection Fence	475.000	LF	\$ 5.00	\$ 2,375.00
5.20	DEMOLITION				
1.21	Combination Curb & Gutter Removal	250.000	LF	\$ 3.25	\$ 812.50
1.22	Asphalt Pavement Removal (Full Depth)	310.000	SY	\$ 15.75	\$ 4,882.50
1.23	Asphalt Pavement Removal (2.5" Mill)	140.000	SY	\$ 6.00	\$ 840.00
5.30	STORM SEWER INSTALLATION				
5.31	Install 48" Storm Sewer	250.000	LF	\$ 110.00	\$ 27,500.00
5.32	Install Storm Manholes (+/- Every 400 LF)	1.000	EACH	\$ 3,500.00	\$ 3,500.00
5.33	Sewer Spoil Removal	1,125.000	CY	\$ 35.00	\$ 39,375.00
5.34	Trench Backfill	850.000	CY	\$ 28.00	\$ 23,800.00
5.40	UTILITY RE-CONNECTION				
5.41	Utility Service Re-connection	5.000	LSUM	\$ 2,000.00	\$ 10,000.00
5.50	PAVING & RESTORATION				
5.51	Install Aggregate Base Course (10")	310.000	SY	\$ 10.50	\$ 3,255.00
5.52	Install Bituminous Binder Course (4.0")	70.000	TON	\$ 90.00	\$ 6,300.00
5.53	Install Bituminous Surface Course (2.50")	80.000	TON	\$ 100.00	\$ 8,000.00
5.54	Parkway Restoration	125.000	SY	\$ 4.00	\$ 500.00
5.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	250.000	LF	\$ 20.00	\$ 5,000.00

6.00	CONCEPTUAL POND EXPANSION (Addison / Wisconsin)	QUANTITY	UNIT	UNIT PRICE	TOTAL
6.10	EROSION CONTROL				
6.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
6.12	Silt Fence Installation (Standard No Wire)	1,200.000	LF	\$ 3.00	\$ 3,600.00
6.13	Erosion Control Blanket (NAG S150BN)	2,500.000	SY	\$ 2.65	\$ 6,625.00
6.20	EARTH EXCAVATION				
6.21	Topsoil Excavation & Placement	2,500.000	CY	\$ 12.00	\$ 30,000.00
6.22	Earth Excavation to Off-Site Spoil Disposal	16,650.000	CY	\$ 45.00	\$ 749,250.00
6.23	CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
6.24	Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
6.30	RESTORATION				
6.31	Turf Seeding W/ 90 day Maintenance	7,500.000	SY	\$ 1.85	\$ 13,875.00
6.40	STORM SEWER INSTALLATION				
6.41	Install 18" Storm Sewer	35.000	LF	\$ 45.00	\$ 1,575.00
6.42	Install 36" Storm Sewer	35.000	LF	\$ 90.00	\$ 3,150.00
6.43	Install Storm Manholes	3.000	EACH	\$ 3,500.00	\$ 10,500.00
6.44	Sewer Spoil Removal	15.000	CY	\$ 35.00	\$ 525.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

7.00	CONCEPTUAL POND EXPANSION (Michigan / Harvard)	QUANTITY	UNIT	UNIT PRICE	TOTAL
7.10	EROSION CONTROL				
	7.11 Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
	7.12 Silt Fence Installation (Standard No Wire)	1,400.000	LF	\$ 3.00	\$ 4,200.00
	7.13 Erosion Control Blanket (NAG S150BN)	2,850.000	SY	\$ 2.65	\$ 7,552.50
7.20	EARTH EXCAVATION				
	7.21 Topsoil Excavation & Placement	3,000.000	CY	\$ 12.00	\$ 36,000.00
	7.22 Earth Excavation to Off-Site Spoil Disposal	17,030.000	CY	\$ 45.00	\$ 766,350.00
	7.23 CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
	7.24 Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
7.30	RESTORATION				
	7.31 Turf Seeding W/ 90 day Maintenance	8,900.000	SY	\$ 1.85	\$ 16,465.00
7.40	STORM SEWER INSTALLATION				
	7.41 Install 12" Storm Sewer	80.000	LF	\$ 35.00	\$ 2,800.00
	7.42 Install 36" Storm Sewer	80.000	LF	\$ 90.00	\$ 7,200.00
	7.42 Install Storm Manholes	3.000	EACH	\$ 3,500.00	\$ 10,500.00
	7.43 Sewer Spoil Removal	30.000	CY	\$ 35.00	\$ 1,050.00

8.00	HOME BUYOUTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
8.10	HOME BUYOUTS FOR DETENTION				
	8.11 Home Buyouts for Addison / Wisconsin Basin	8.000	EACH	\$ 240,000.00	\$ 1,920,000.00
	8.12 Home Buyouts for Michigan / Harvard Basin	9.000	EACH	\$ 240,000.00	\$ 2,160,000.00

9.00	MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
	9.01 Maintenance of Traffic	1.000	LSUM	\$ 25,000.00	\$ 25,000.00
	9.02 Mobilization	1.000	EACH	\$ 10,000.00	\$ 10,000.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 1d

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	\$ 22,000.00
2.00	CONCEPTUAL STORM SEWER ESTIMATE (Increase Inlet Capacities at Various Locations and Read Yard)	\$ 143,000.00
3.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Addison)	\$ 157,000.00
4.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Madison)	\$ 437,000.00
5.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY - Michigan)	\$ 140,000.00
6.00	CONCEPTUAL POND EXPANSION (Addison / Wisconsin)	\$ 853,000.00
7.00	CONCEPTUAL POND EXPANSION (Michigan / Harvard)	\$ 886,000.00
8.00	HOME BUYOUTS	\$ 4,080,000.00
9.00	MISCELLANEOUS	\$ 35,000.00
	SUBTOTAL (CONSTRUCTION - EXCLUDES BUYOUTS):	\$ 2,673,000.00
	CONTINGENCY (15%)	\$ 401,000.00
	CONCEPTUAL EOPCC TOTAL (CONSTRUCTION - EXCLUDES BUYOUT COSTS):	\$ 3,074,000.00
	DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 615,000.00
	CONCEPTUAL EOPCC TOTAL FOR CONSTRUCTION (EXCLUDES BUYOUTS)	\$ 3,689,000.00
	HOME BUYOUT COST	\$ 4,080,000.00
	CONTINGENCY (15%)	\$ 612,000.00
	CONCEPTUAL EOPCC TOTAL (HOME BUYOUTS):	\$ 4,692,000.00
	CONCEPTUAL EOPCC TOTAL:	\$ 8,381,000.00

Notes:

- 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

- 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.
- 2) Home Buyout Costs are based on 105% of Assessed Value from York Township Assessor and includes \$20,000 for demolition

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SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 2a

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696

Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study

Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	3.000	EACH	\$ 100.00	\$ 300.00
1.20	EARTHWORK				
	1.21 Mobilization	1.000	EACH	\$ 4,000.00	\$ 4,000.00
	1.22 Minor Grading / Reshaping of Overflow	1.000	EACH	\$ 5,000.00	\$ 5,000.00
	1.23 Topsoil Stockpile and Respread	1.000	LSUM	\$ 2,500.00	\$ 2,500.00
	1.24 Yard / Parkway Restoration	500.000	SY	\$ 4.00	\$ 2,000.00

1.00	CONCEPTUAL STORM SEWER ESTIMATE (Project Alt 1a)	\$ 14,000.00
	SUBTOTAL:	\$ 14,000.00
	CONTINGENCY (20%):	\$ 3,000.00
	CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 17,000.00
	DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (25%):	\$ 4,000.00
	CONCEPTUAL EOPCC TOTAL	\$ 21,000.00

Notes:

- 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

- 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 3a

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	15.000	EACH	\$ 100.00	\$ 1,500.00
	1.12 Staging Area	50.000	SY	\$ 25.00	\$ 1,250.00
	1.13 Tree Trunk Protection	20.000	EACH	\$ 225.00	\$ 4,500.00
	1.14 Tree Protection Fence	600.000	LF	\$ 5.00	\$ 3,000.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	500.000	LF	\$ 3.25	\$ 1,625.00
	1.22 Asphalt Pavement Removal (Full Depth)	400.000	SY	\$ 15.75	\$ 6,300.00
	1.24 Canopy Clearing / Trimming	1.000	LSUM	\$ 6,500.00	\$ 6,500.00
1.30	PAVING & RESTORATION				
	1.31 Install Aggregate Base Course (10")	400.000	SY	\$ 10.50	\$ 4,200.00
	1.32 Install Bituminous Binder Course (4.0")	100.000	TON	\$ 90.00	\$ 9,000.00
	1.33 Install Bituminous Surface Course (2.50")	100.000	TON	\$ 100.00	\$ 10,000.00
	1.34 Coarse Aggregate Base (CA-7)	65.000	CY	\$ 35.00	\$ 2,275.00
	1.35 Parkway Restoration	500.000	SY	\$ 4.00	\$ 2,000.00
	1.36 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	500.000	SF	\$ 20.00	\$ 10,000.00
	1.37 5' Sidewalk	500.000	LF	\$ 20.00	\$ 10,000.00

2.00	CONCEPTUAL POND EXPANSION (LUFKIN)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
	2.11 Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
	2.12 Silt Fence Installation (Standard No Wire)	5,000.000	LF	\$ 3.00	\$ 15,000.00
	2.13 Erosion Control Blanket (NAG S150BN)	4,500.000	SY	\$ 2.65	\$ 11,925.00
2.20	EARTH EXCAVATION				
	2.21 Topsoil Excavation & Placement	1,500.000	CY	\$ 12.00	\$ 18,000.00
	2.22 Earth Excavation to Off-Site Spoil Disposal	6,500.000	CY	\$ 35.00	\$ 227,500.00
	2.23 CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
	2.24 Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
2.30	RESTORATION				
	2.31 Turf Seeding W/ 90 day Maintenance	4,500.000	SY	\$ 1.85	\$ 8,325.00

3.00	MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
	3.01 Residential driveway reconstruction, regrading, interior drainage	1.000	LSUM	\$ 150,000.00	\$ 150,000.00

1.00	CONCEPTUAL ROADWAY RECONSTRUCTION				\$ 72,000.00
2.00	CONCEPTUAL POND EXPANSION (LUFKIN)				\$ 315,000.00
3.00	MISCELLANEOUS				\$ 150,000.00
				SUBTOTAL:	\$ 537,000.00
				CONTINGENCY (15%):	\$ 81,000.00
				CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 618,000.00
				DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 124,000.00
				CONCEPTUAL EOPCC TOTAL	\$ 742,000.00

Notes:

1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 3b

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (WITHIN RAND ROAD)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
1.11	Inlet Sediment Traps	12.000	EACH	\$ 100.00	\$ 1,200.00
1.20	DEMOLITION				
1.21	Combination Curb & Gutter Removal	240.000	LF	\$ 10.00	\$ 2,400.00
1.22	Asphalt Pavement Removal (Full Depth)	200.000	SY	\$ 15.75	\$ 3,150.00
1.30	STORM SEWER INSTALLATION				
1.31	Install 12" Storm Sewer	110.000	LF	\$ 35.00	\$ 3,850.00
1.32	Install 24" Storm Sewer	200.000	LF	\$ 60.00	\$ 12,000.00
1.33	Install 30" Storm Sewer	250.000	LF	\$ 80.00	\$ 20,000.00
1.34	Install 48" Storm Sewer	215.000	LF	\$ 110.00	\$ 23,650.00
1.35	Install Storm Inlets	12.000	EACH	\$ 2,500.00	\$ 30,000.00
1.36	Sewer Spoil Removal	70.000	CY	\$ 35.00	\$ 2,450.00
1.37	Trench Backfill	60.000	CY	\$ 28.00	\$ 1,680.00
1.38	Install High Capacity Grates on Existing Inlets	12.000	EACH	\$ 250.00	\$ 3,000.00
1.40	UTILITY RE-CONNECTION				
1.41	Utility Service Re-connection	6.000	LSUM	\$ 2,000.00	\$ 12,000.00
1.50	PAVING & RESTORATION				
1.51	Install Aggregate Base Course (10")	500.000	SY	\$ 10.50	\$ 5,250.00
1.52	Install Bituminous Binder Course (4.0")	120.000	TON	\$ 90.00	\$ 10,800.00
1.53	Install Bituminous Surface Course (2.50")	130.000	TON	\$ 100.00	\$ 13,000.00
1.54	Parkway Restoration	100.000	SY	\$ 4.00	\$ 400.00
1.55	B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	240.000	LF	\$ 20.00	\$ 4,800.00

2.00	CONCEPTUAL POND EXPANSION (LUFKIN)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
2.11	Construction Entrance	150.000	SY	\$ 25.00	\$ 3,750.00
2.12	Silt Fence Installation (Standard No Wire)	5,000.000	LF	\$ 3.00	\$ 15,000.00
2.13	Erosion Control Blanket (NAG S150BN)	4,500.000	SY	\$ 2.65	\$ 11,925.00
2.20	EARTH EXCAVATION				
2.21	Topsoil Excavation & Placement	1,500.000	CY	\$ 12.00	\$ 18,000.00
2.22	Earth Excavation to Off-Site Spoil Disposal	6,500.000	CY	\$ 35.00	\$ 227,500.00
2.23	CCDD Testing	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
2.24	Dewatering Allowance	1.000	LSUM	\$ 15,000.00	\$ 15,000.00
2.30	RESTORATION				
2.31	Turf Seeding W/ 90 day Maintenance	4,500.000	SY	\$ 1.85	\$ 8,325.00

1.00	CONCEPTUAL STORM SEWER ESTIMATE (WITHIN RAND ROAD)				\$ 167,000.00
2.00	CONCEPTUAL POND EXPANSION (LUFKIN)				\$ 315,000.00
				SUBTOTAL:	\$ 482,000.00
				CONTINGENCY (15%)	\$ 72,000.00
				CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 554,000.00
				DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 111,000.00
				CONCEPTUAL EOPCC TOTAL	\$ 665,000.00

Notes:

1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

This Opinion of Probable Construction Cost is based on a concept prepared by V3 Companies. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 4a

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

1.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY)	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10	EROSION CONTROL				
	1.11 Inlet Sediment Traps	10.000	EACH	\$ 100.00	\$ 1,000.00
	1.12 Staging Area	40.000	SY	\$ 25.00	\$ 1,000.00
	1.13 Tree Trunk Protection	10.000	EACH	\$ 225.00	\$ 2,250.00
	1.14 Tree Protection Fence	300.000	LF	\$ 5.00	\$ 1,500.00
1.20	DEMOLITION				
	1.21 Combination Curb & Gutter Removal	1,880.000	LF	\$ 3.25	\$ 6,110.00
	1.22 Asphalt Pavement Removal (Full Depth)	2,925.000	SY	\$ 15.75	\$ 46,068.75
	1.23 Asphalt Pavement Removal (2.5" Mill)	1,050.000	SY	\$ 6.00	\$ 6,300.00
1.30	STORM SEWER INSTALLATION				
	1.31 Install 66" Storm Sewer	1,880.000	LF	\$ 150.00	\$ 282,000.00
	1.32 Install Storm Manholes (+/- Every 400 LF)	5.000	EACH	\$ 3,500.00	\$ 17,500.00
	1.33 Sewer Spoil Removal	10,725.000	CY	\$ 35.00	\$ 375,375.00
	1.34 Trench Backfill	7,380.000	CY	\$ 28.00	\$ 206,640.00
1.40	UTILITY RE-CONNECTION				
	1.41 Utility Service Re-connection	22.000	LSUM	\$ 2,000.00	\$ 44,000.00
1.50	PAVING & RESTORATION				
	1.51 Install Aggregate Base Course (10")	2,925.000	SY	\$ 10.50	\$ 30,712.50
	1.52 Install Bituminous Binder Course (4.0")	660.000	TON	\$ 90.00	\$ 59,400.00
	1.53 Install Bituminous Surface Course (2.50")	725.000	TON	\$ 100.00	\$ 72,500.00
	1.54 Parkway Restoration	1,195.000	SY	\$ 4.00	\$ 4,780.00
	1.55 B6.12 Curb & Gutter (10" Flag, Cont. Rebar)	1,880.000	LF	\$ 20.00	\$ 37,600.00

2.00	CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10	EROSION CONTROL				
	2.11 Construction Entrance	30.000	SY	\$ 25.00	\$ 750.00
	2.12 Silt Fence Installation (Standard No Wire)	1,260.000	LF	\$ 3.00	\$ 3,780.00
	2.13 Erosion Control Blanket (NAG S75BN)	2,000.000	SY	\$ 2.15	\$ 4,300.00
2.20	STORM SEWER INSTALLATION				
	2.21 Install 66" Storm Sewer	410.000	LF	\$ 150.00	\$ 61,500.00
	2.22 Install Storm Manholes (+/- Every 400 LF)	2.000	EACH	\$ 3,500.00	\$ 7,000.00
	2.23 Sewer Spoil Removal	1,000.000	CY	\$ 35.00	\$ 35,000.00
2.30	RESTORATION				
	2.31 Turf Seeding W/ 90 day Maintenance	1,500.000	SY	\$ 1.85	\$ 2,775.00

SUGAR CREEK WATERSHED ANALYSIS - PROJECT ALTERNATIVE 4a

Client: Vydas Juskelis
 Village of Villa Park
 20 South Ardmore Avenue
 Villa Park, IL 60181-2696
Phone: 630-592-6072
Email: vydasj@invillapark.com

Job Name: Sugar Creek
 Storm Sewer Study
Date of Plans: N/A
Revision Date: 4/9/2015
Date of Estimate: 3/27/2015

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COSTS

3.00	MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
	3.01 Maintenance of Traffic	1.000	LSUM	\$ 25,000.00	\$ 25,000.00
	3.02 Mobilization	1.000	EACH	\$ 10,000.00	\$ 10,000.00

1.00	CONCEPTUAL STORM SEWER ESTIMATE (ROADWAY)				\$ 1,195,000.00
2.00	CONCEPTUAL STORM SEWER ESTIMATE (OPEN FIELD)				\$ 115,000.00
3.00	MISCELLANEOUS				\$ 35,000.00
				SUBTOTAL:	\$ 1,345,000.00
				CONTINGENCY (15%)	\$ 202,000.00
				CONCEPTUAL EOPCC TOTAL (CONSTRUCTION):	\$ 1,547,000.00
				DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (20%):	\$ 309,000.00
				CONCEPTUAL EOPCC TOTAL	\$ 1,856,000.00

Notes:

- 1) This is a conceptual estimate. Actual project costs will be dependent on final design and can vary substantially from conceptual costs shown.

The Following is specifically excluded from this estimate:

- 1) Soft Costs including but not limited to ROW acquisition, permits, bonds etc.

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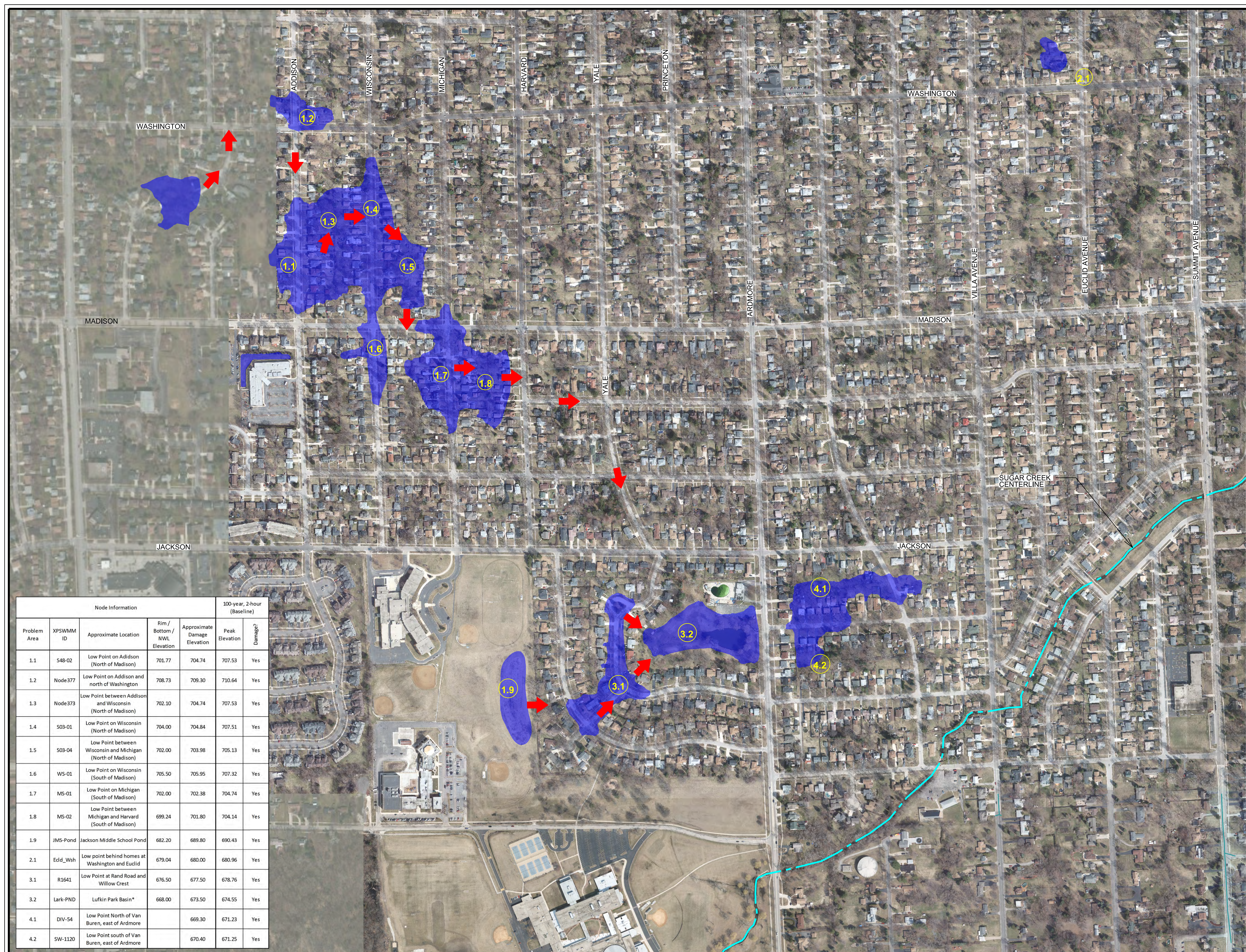
Appendix C – Inundation Exhibits (with Conceptual Improvements)





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Node Information			100-year, 2-hour (Baseline)			
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Damage?
1.1	S48-02	Low Point on Addison (North of Madison)	701.77	704.74	707.53	Yes
1.2	Node377	Low Point on Addison and north of Washington	708.73	709.30	710.64	Yes
1.3	Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	707.53	Yes
1.4	S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	707.51	Yes
1.5	S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	705.13	Yes
1.6	WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.32	Yes
1.7	MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	704.74	Yes
1.8	MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	704.14	Yes
1.9	JMS-Pond	Jackson Middle School Pond	682.20	689.80	690.43	Yes
2.1	Edd_Wsh	Low point behind homes at Washington and Euclid	679.04	680.00	680.96	Yes
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	677.50	678.76	Yes
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.55	Yes
4.1	DIV-54	Low Point North of Van Buren, east of Ardmore	669.30	671.23	671.23	Yes
4.2	SW-1120	Low Point south of Van Buren, east of Ardmore	670.40	671.25	671.25	Yes

INUNDATION MAP - EXISTING MODEL
100-YR, 2-HR STORM EVENT

SUGAR CREEK WATERSHED
STORM SEWER STUDY

VILLA PARK ILLINOIS

REVISIONS

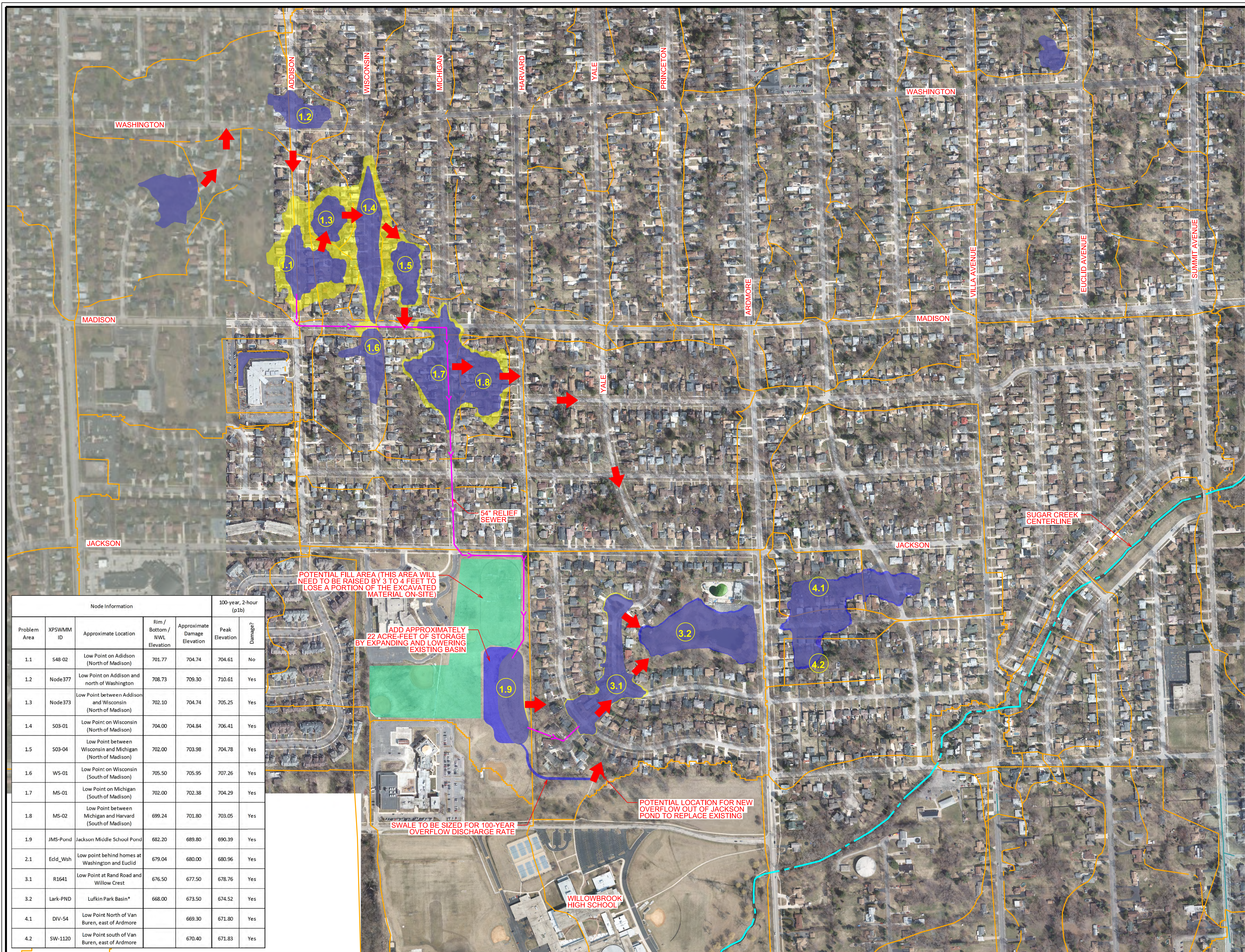
NO.	DATE	DESCRIPTION

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FILE NAME: EX1_Inndtn_Ex	DRAWN BY: CWH	EX1
ORIGINAL ISSUE DATE: 3/27/15	CHECKED BY: DLM	
SCALE: 1"=250'	PROJECT MANAGER: DLM	



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POTENTIAL FILL AREA (THIS AREA WILL NEED TO BE RAISED BY 3 TO 4 FEET TO LOSE A PORTION OF THE EXCAVATED MATERIAL ON-SITE)

ADD APPROXIMATELY 22 ACRE-FEET OF STORAGE BY EXPANDING AND LOWERING EXISTING BASIN

POTENTIAL LOCATION FOR NEW OVERFLOW OUT OF JACKSON POND TO REPLACE EXISTING

SWALE TO BE SIZED FOR 100-YEAR OVERFLOW DISCHARGE RATE

54" RELIEF SEWER

SUGAR CREEK CENTERLINE

WILLOWBROOK HIGH SCHOOL

Node Information				100-year, 2-hour (p1b)		
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Damage?
1.1	S48-02	Low Point on Addison (North of Madison)	701.77	704.74	704.61	No
1.2	Node377	Low Point on Addison and north of Washington	708.73	709.30	710.61	Yes
1.3	Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	705.25	Yes
1.4	S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.41	Yes
1.5	S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	704.78	Yes
1.6	WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.26	Yes
1.7	MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	704.29	Yes
1.8	MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	703.05	Yes
1.9	JMS-Pond	Jackson Middle School Pond	682.20	689.80	690.39	Yes
2.1	Edd_Wsh	Low point behind homes at Washington and Euclid	679.04	680.00	680.96	Yes
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	677.50	678.76	Yes
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.52	Yes
4.1	DIV-54	Low Point North of Van Buren, east of Ardmore	669.30	669.30	671.80	Yes
4.2	SW-1120	Low Point south of Van Buren, east of Ardmore	670.40	670.40	671.83	Yes

INUNDATION MAP - PROPOSED MODEL
(PROPOSED ALTERNATIVE P1B)
100-YR, 2-HR STORM EVENT

SUGAR CREEK WATERSHED
STORM SEWER STUDY

VILLA PARK ILLINOIS

REVISIONS

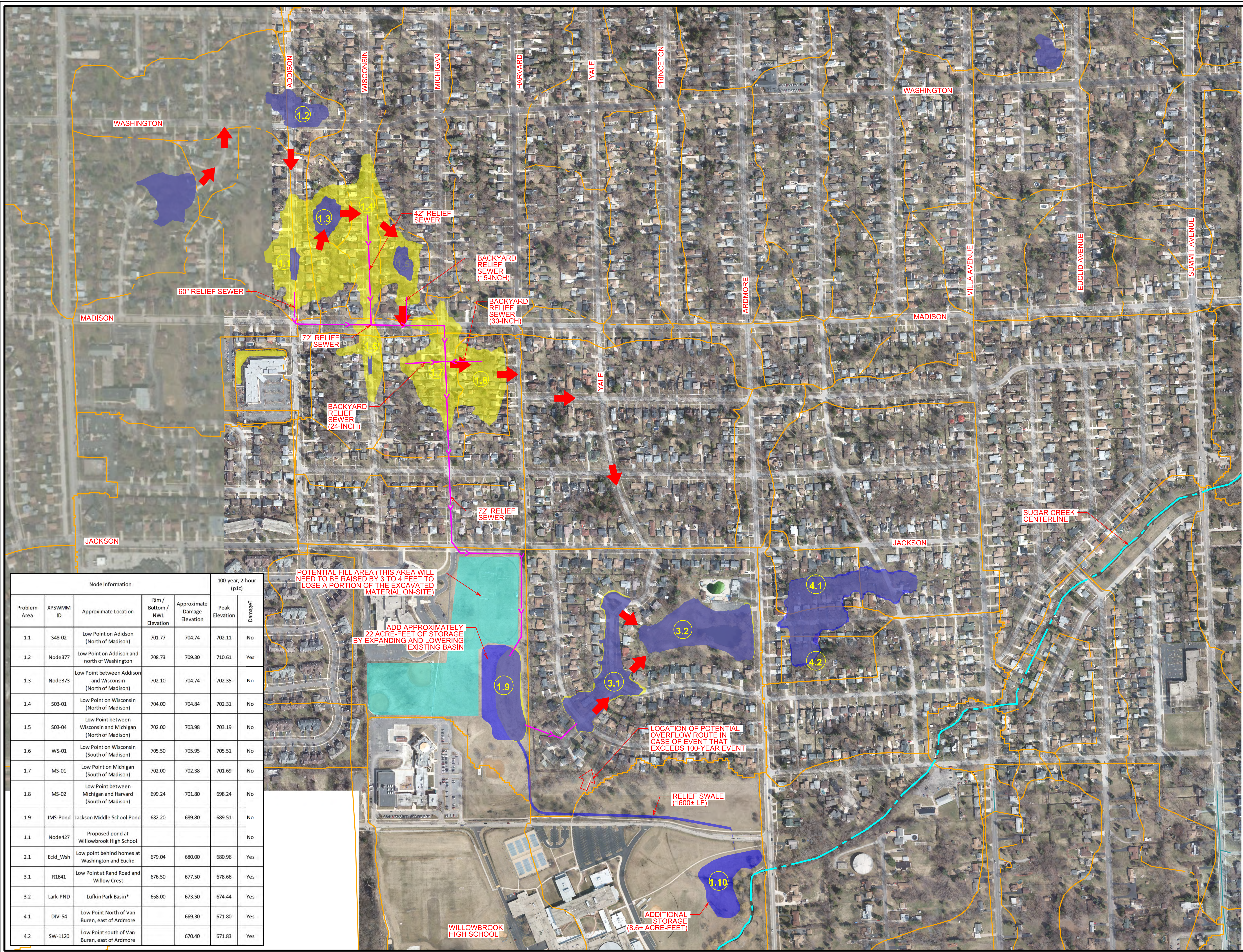
NO.	DATE	DESCRIPTION

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FILE NAME: EX2_Inndtn_P1B	DRAWN BY: CWH	EX2
ORIGINAL ISSUE DATE: 3/27/15	CHECKED BY: DLM	
SCALE: 1"=250'	PROJECT MANAGER: DLM	



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Node Information				100-year, 2-hour (p1c)		
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Damage?
1.1	S48-02	Low Point on Addison (North of Madison)	701.77	704.74	702.11	No
1.2	Node377	Low Point on Addison and north of Washington	708.73	709.30	710.61	Yes
1.3	Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	702.35	No
1.4	S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	702.31	No
1.5	S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	703.19	No
1.6	WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	705.51	No
1.7	MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	701.69	No
1.8	MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	698.24	No
1.9	JMS-Pond	Jackson Middle School Pond	682.20	689.80	689.51	No
1.1	Node427	Proposed pond at Willowbrook High School				No
2.1	Edd_Wsh	Low point behind homes at Washington and Euclid	679.04	680.00	680.96	Yes
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	677.50	678.66	Yes
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.44	Yes
4.1	DIV-54	Low Point North of Van Buren, east of Ardmore		669.30	671.80	Yes
4.2	SW-1120	Low Point south of Van Buren, east of Ardmore		670.40	671.83	Yes

POTENTIAL FILL AREA (THIS AREA WILL NEED TO BE RAISED BY 3 TO 4 FEET TO LOSE A PORTION OF THE EXCAVATED MATERIAL ON-SITE)

ADD APPROXIMATELY 22 ACRE-FEET OF STORAGE BY EXPANDING AND LOWERING EXISTING BASIN

LOCATION OF POTENTIAL OVERFLOW ROUTE IN CASE OF EVENT THAT EXCEEDS 100-YEAR EVENT

RELIEF SWALE (1600± LF)

ADDITIONAL STORAGE (8.6± ACRE-FEET)

WILLOWBROOK HIGH SCHOOL

**INUNDATION MAP - PROPOSED MODEL
(PROPOSED ALTERNATIVE P1C)
100-YR, 2-HR STORM EVENT**

**SUGAR CREEK WATERSHED
STORM SEWER STUDY**

VILLAGE OF VILLA PARK ILLINOIS

REVISIONS

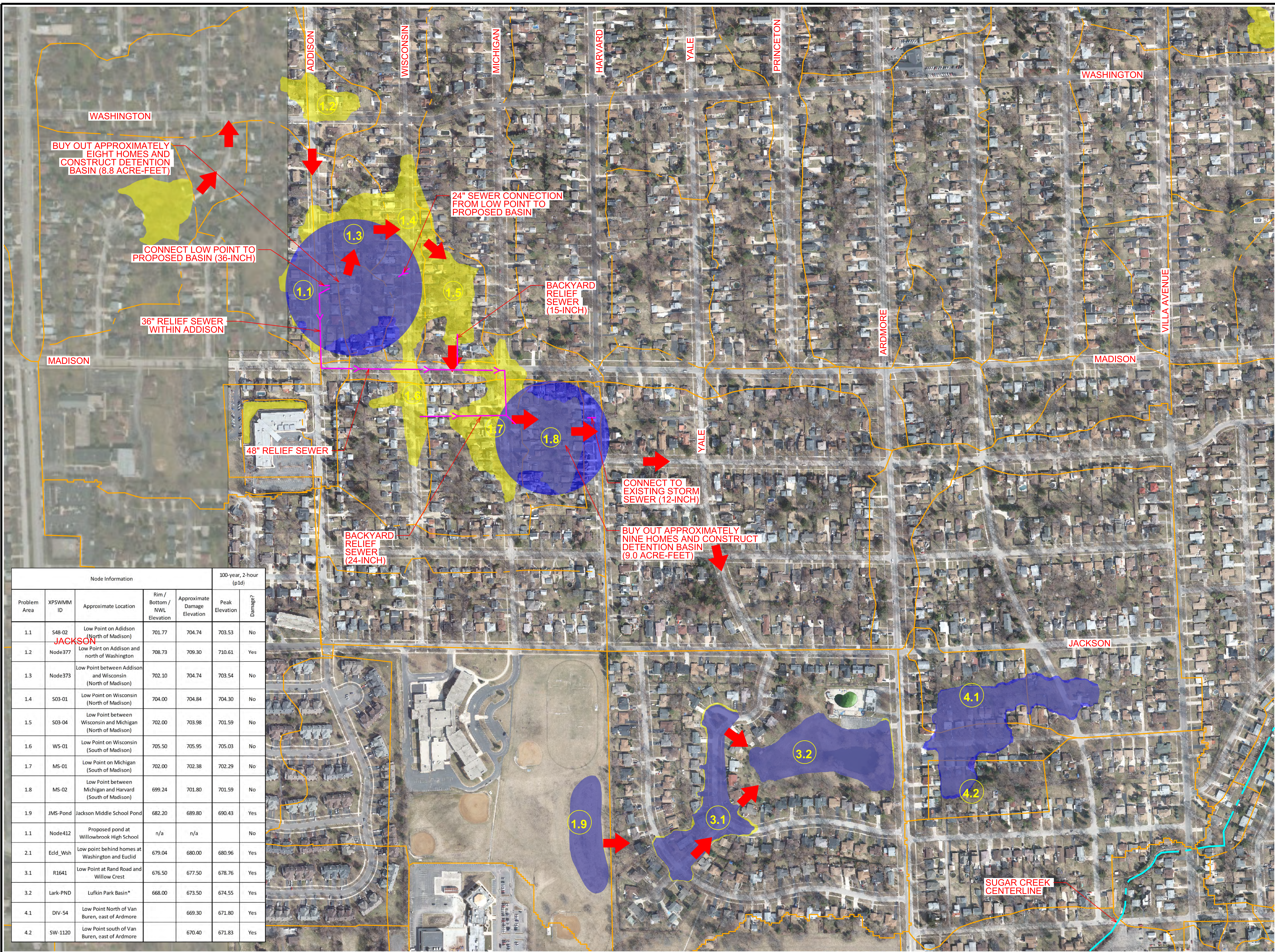
NO.	DATE	DESCRIPTION

PROJECT NO: 07180.052	DESIGNED BY: CWH	DRAWING NO.:
FILE NAME: EX3_Inndtn_P1D	DRAWN BY: CWH	EX3
ORIGINAL ISSUE DATE: 3/27/15	CHECKED BY: DLM	
SCALE: 1"=250'	PROJECT MANAGER: DLM	



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 Woodridge, IL 60517
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Node Information					100-year, 2-hour (p1d)	
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation	Damage?
1.1	548-02	Low Point on Addison (North of Madison)	701.77	704.74	703.53	No
1.2	Node377	Low Point on Addison and north of Washington	708.73	709.30	710.61	Yes
1.3	Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	703.54	No
1.4	S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	704.30	No
1.5	S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	701.59	No
1.6	WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	705.03	No
1.7	MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	702.29	No
1.8	MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	701.59	No
1.9	JMS-Pond	Jackson Middle School Pond	682.20	689.80	690.43	Yes
1.1	Node412	Proposed pond at Willowbrook High School	n/a	n/a		No
2.1	Ecdl_Wsh	Low point behind homes at Washington and Euclid	679.04	680.00	680.96	Yes
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	677.50	678.76	Yes
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.55	Yes
4.1	DIV-54	Low Point North of Van Buren, east of Ardmore	669.30	671.80	671.80	Yes
4.2	SW-1120	Low Point south of Van Buren, east of Ardmore	670.40	671.83	671.83	Yes

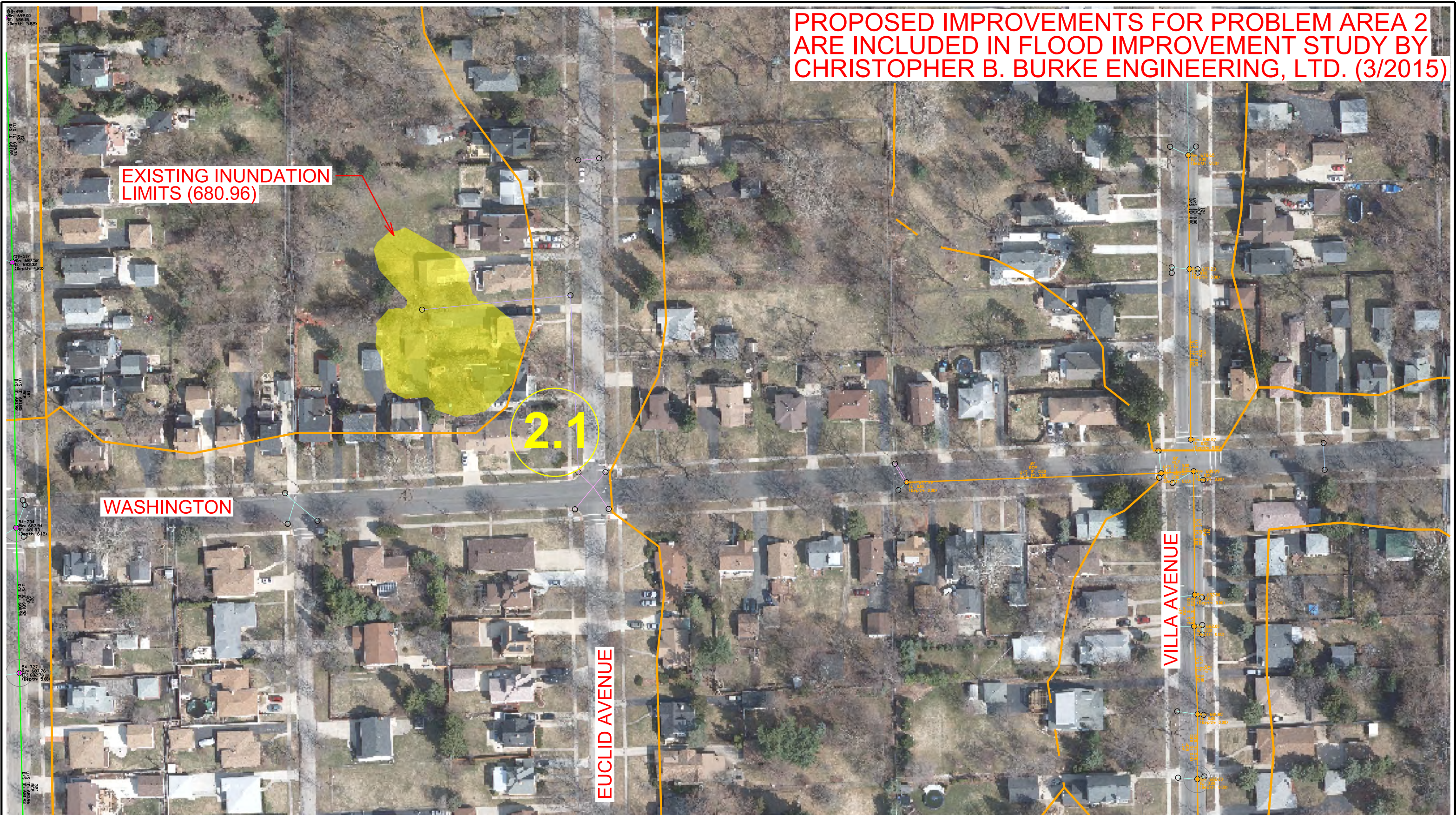
INUNDATION MAP - PROPOSED MODEL
 (PROPOSED ALTERNATIVE P1D)
 100-YR, 2-HR STORM EVENT

SUGAR CREEK WATERSHED
 STORM SEWER STUDY

REVISIONS		
NO.	DATE	DESCRIPTION

PROJECT NO: 07180.052	DESIGNED BY: CWH	DRAWING NO.:
FILE NAME: EX3_Inndtn_P1D	DRAWN BY: CWH	EX4
ORIGINAL ISSUE DATE: 3/27/15	CHECKED BY: DLM	
SCALE: 1"=200'	PROJECT MANAGER: DLM	

PROPOSED IMPROVEMENTS FOR PROBLEM AREA 2 ARE INCLUDED IN FLOOD IMPROVEMENT STUDY BY CHRISTOPHER B. BURKE ENGINEERING, LTD. (3/2015)



DATE: 5/19/15



V3 Companies
7325 Janes Avenue
Woodridge, IL 60517
630.724.9200 phone
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SUGAR CREEK WATERSHED STORM SEWER STUDY

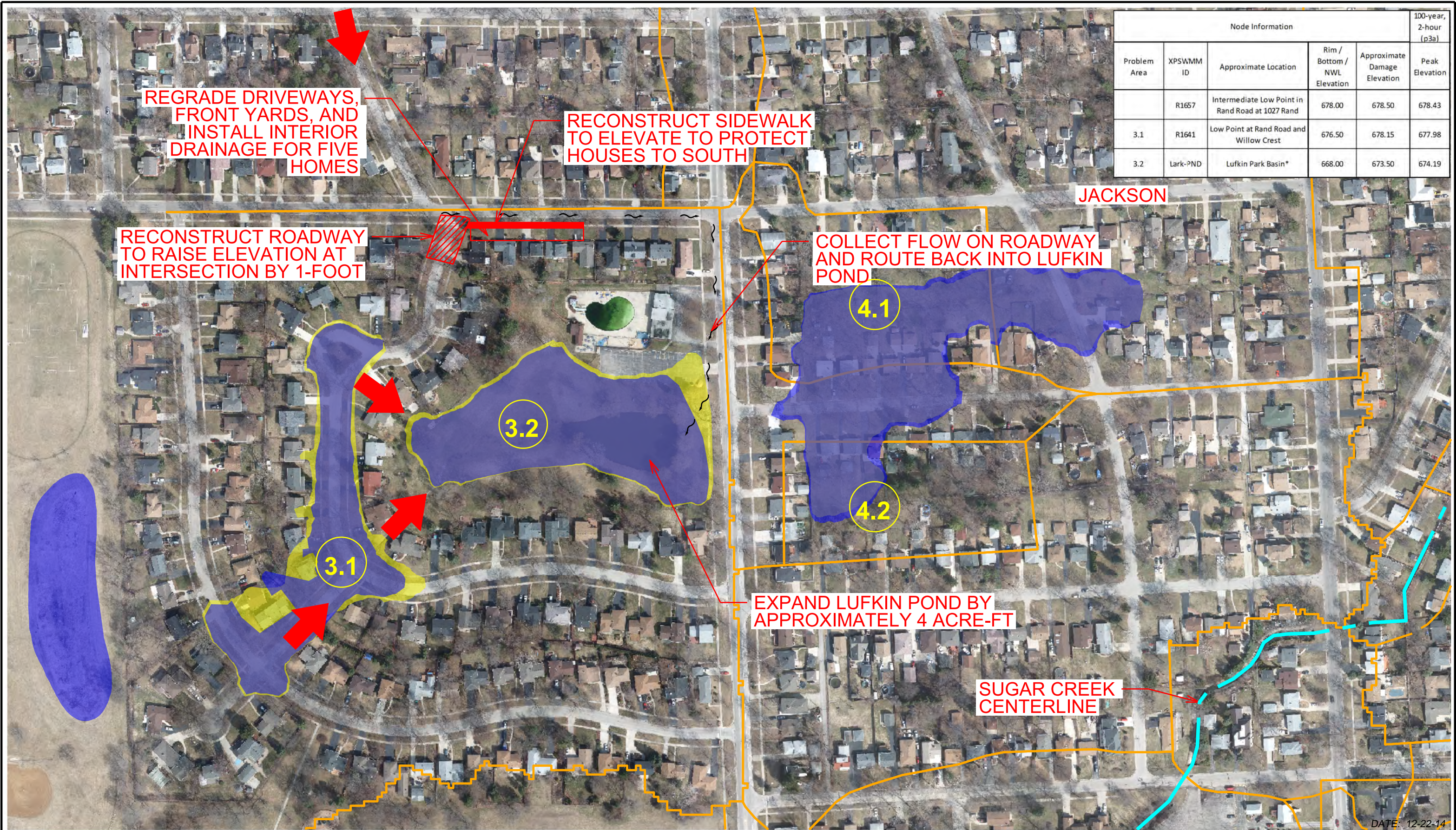
VILLA PARK

ILLINOIS


EXHIBIT 5 PROBLEM AREA 2 100-YR, 2-HR STORM EVENT



SCALE: 1"=200'



Node Information					100-year, 2-hour (p3a)
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation
	R1657	Intermediate Low Point in Rand Road at 1027 Rand	678.00	678.50	678.43
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	678.15	677.98
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.19


 V3 Companies
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 Woodridge, IL 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

SUGAR CREEK WATERSHED STORM SEWER STUDY

VILLA PARK

ILLINOIS

EXHIBIT 6 INUNDATION MAP - PROPOSED MODEL (PROPOSED ALTERNATIVE P3A) 100-YR, 2-HR STORM EVENT



SCALE: 1"=200'

Node Information					100-year, 2-hour (p3c)
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation
	R1657	Intermediate Low Point in Rand Road at 1027 Rand	678.00	678.50	678.67
3.1	R1641	Low Point at Rand Road and Willow Crest	676.50	678.15	678.33
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.33



V3 Companies
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630.724.9200 phone
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VILLA PARK

SUGAR CREEK WATERSHED STORM SEWER STUDY

ILLINOIS

EXHIBIT 7 INUNDATION MAP - PROPOSED MODEL (PROPOSED ALTERNATIVE P3B) 100-YR, 2-HR STORM EVENT



SCALE: 1"=200'



Node Information					100-year, 2-hour (p3c)
Problem Area	XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation	Peak Elevation
	R1557	Intermediate Low Point in Rand Road at 1027 Rand	678.00	678.50	678.63
3.1	R1541	Low Point at Rand Road and Willow Crest	676.50	678.15	678.17
3.2	Lark-PND	Lufkin Park Basin*	668.00	673.50	674.34

HOME BUYOUT AND CONSTRUCT OVERFLOW SWALE INTO LUFKIN POND

EXPAND LUFKIN POND BY APPROXIMATELY 4 ACRE-FT

SUGAR CREEK CENTERLINE

DATE: 3/27/15

V3
 V3 Companies
 7325 Janes Avenue
 Woodridge, IL 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

**SUGAR CREEK WATERSHED
 STORM SEWER STUDY**

VILLA PARK

ILLINOIS

**EXHIBIT 8
 INUNDATION MAP - PROPOSED MODEL
 (PROPOSED ALTERNATIVE P3C)
 100-YR, 2-HR STORM EVENT**



SCALE: 1"=200'



Node Information				100-year, 2-hour (Baseline)	100-year, 2-hour (p4a)
Problem Area	XPSWMM ID	Approximate Location	Approximate Damage Elevation	Peak Elevation	Peak Elevation
4.1	DIV-54	Low Point North of Van Buren, east of Ardmore	669.80	671.23	669.54
4.2	SW-1120	Low Point south of Van Buren, east of Ardmore	670.40	671.25	671.11

DATE: 3/27/15

V3
 V3 Companies
 7325 Janes Avenue
 Woodridge, IL 60517
 630.724.9200 phone
 630.724.9202 fax
 www.v3co.com

**SUGAR CREEK WATERSHED
 STORM SEWER STUDY**

VILLA PARK

ILLINOIS

**EXHIBIT 9
 INUNDATION MAP - PROPOSED MODEL
 (PROPOSED ALTERNATIVE P4A)
 100-YR, 2-HR STORM EVENT**



SCALE: 1"=200'

Appendix D – Calculations

Damage Elevation Calculations

Sugar Creek Elevation and Flow Comparisons



SUGAR CREEK WATERSHED STORM SEWER ANALYSIS
Damage Analysis - 100 year, 2-hour storm events - PROBLEM AREA 1

March 27, 2015

Node Information						100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour		
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation			Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
			Low Opening	F/F	T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
Node377	Low Point on Addison and north of Washington	708.73	709.30	#N/A	#N/A	710.64			710.66			710.61			710.61			710.61		
	342 E. Washington Street		709.30	#N/A	#N/A	1.34			1.36			1.31			1.31			1.31		
	537 S. Addison Avenue		710.30	#N/A	#N/A	0.34			0.36			0.31			0.31			0.31		
	533 S. Addison Avenue		712.30	#N/A	#N/A	No			No			No			No			No		
	529 S. Addison Avenue		712.80	#N/A	#N/A	No			No			No			No			No		
	1144 Washington		710.10	#N/A	#N/A	0.54			0.56			0.51			0.51			0.51		
	432 S. Addison Avenue		710.50	#N/A	#N/A	0.14			0.16			0.11			0.11			0.11		
	430 S. Addison Avenue		712.50	#N/A	#N/A	No			No			No			No			No		
	420 S. Addison Avenue		713.40	#N/A	#N/A	No			No			No			No			No		
Number of Houses with Depth of Flooding greater than 0 feet						4.00	0.00	0.00	4.00	0.00	0.00	4.00	0.00	0.00	4.00	0.00	0.00	4.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S48-02	Low Point on Addison (North of Madison)	701.77	704.74	706.11	705.42	707.53			707.47			704.61			702.11			703.53		
	1148 E. Madison		709.47	711.67	710.17	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	556 S. Addison		707.27	709.75	709.00	0.26	No	No	0.20	No	No	No	No	No	No	No	No	No	No	No
	552 S. Addison		706.52	706.11	705.42	1.01	1.42	2.11	0.95	1.36	2.05	No	No	No	No	No	No	No	No	No
	550 S. Addison		705.34	706.37	705.92	2.19	1.16	1.61	2.13	1.10	1.55	No	No	No	No	No	No	No	No	No
	548 S. Addison		706.25	707.37	706.04	1.28	0.16	1.49	1.22	0.10	1.43	No	No	No	No	No	No	No	No	No
	544 S. Addison		708.22	709.20	708.00	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	540 S. Addison		706.37	710.36	709.32	1.16	No	No	1.10	No	No	No	No	No	No	No	No	No	No	No
	536 S. Addison		707.23	707.23	709.31	0.30	0.30	No	0.24	0.24	No	No	No	No	No	No	No	No	No	No
	532 S. Addison		709.60	712.97	709.68	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	342 W. Madison		705.90	709.71	708.76	1.63	No	No	1.57	No	No	No	No	No	No	No	No	No	No	No
	338 W. Madison		709.92	710.97	709.89	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	334 W. Madison		708.77	711.50	710.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Addison		705.10	707.49	706.33	2.43	0.04	1.20	2.37	No	1.14	No	No	No	No	No	No	No	No	No
	729 S. Addison		704.74	707.06	705.91	2.79	0.47	1.62	2.73	0.41	1.56	No	No	No	No	No	No	No	No	No
	725 S. Addison		704.75	706.75	705.68	2.78	0.78	1.85	2.72	0.72	1.79	No	No	No	No	No	No	No	No	No
	721 S. Addison		707.06	707.00	705.74	0.47	0.53	1.79	0.41	0.47	1.73	No	No	No	No	No	No	No	No	No
	715 S. Addison		705.40	708.51	707.42	2.13	No	0.11	2.07	No	0.05	No	No	No	No	No	No	No	No	No
	713 S. Addison		707.36	709.50	708.65	0.17	No	No	0.11	No	No	No	No	No	No	No	No	No	No	No
	709 S. Addison		706.18	707.14	706.21	1.35	0.39	1.32	1.29	0.33	1.26	No	No	No	No	No	No	No	No	No
	705 S. Addison		705.53	706.70	705.66	2.00	0.83	1.87	1.94	0.77	1.81	No	No	No	No	No	No	No	No	No
	701 S. Addison		705.63	707.55	706.45	1.90	No	1.08	1.84	No	1.02	No	No	No	No	No	No	No	No	No
	637 S. Addison		706.50	707.43	706.58	1.03	0.10	0.95	0.97	0.04	0.89	No	No	No	No	No	No	No	No	No
	635 S. Addison		707.65	710.05	708.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						17.00	11.00	12.00	17.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						13.00	2.00	10.00	11.00	2.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						6.00	0.00	1.00	5.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	1.00	2.00	17.00	11.00	12.00	17.00	11.00	12.00	17.00	11.00	12.00

Node Information				100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																		
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)			
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.13	705.48	707.53			707.47			705.25			702.35			703.54			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
	342 W. Madison		705.90	709.71	708.76	1.63	No	No	1.57	No	No	No	No	No	No	No	No	No	No	No	No
	338 W. Madison		709.92	710.97	709.89	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	334 W. Madison		708.77	711.50	710.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Addison		705.10	707.49	706.33	2.43	0.04	1.20	2.37	No	1.14	0.15	No	No	No	No	No	No	No	No	No
	729 S. Addison		704.74	707.06	705.91	2.79	0.47	1.62	2.73	0.41	1.56	0.51	No	No	No	No	No	No	No	No	No
	725 S. Addison		704.75	706.75	705.68	2.78	0.78	1.85	2.72	0.72	1.79	0.50	No	No	No	No	No	No	No	No	No
	721 S. Addison		707.06	707.00	705.74	0.47	0.53	1.79	0.41	0.47	1.73	No	No	No	No	No	No	No	No	No	No
	715 S. Addison		705.40	708.51	707.42	2.13	No	0.11	2.07	No	0.05	No	No	No	No	No	No	No	No	No	No
	713 S. Addison		707.36	709.50	708.65	0.17	No	No	0.11	No	No	No	No	No	No	No	No	No	No	No	No
	709 S. Addison		706.18	707.14	706.21	1.35	0.39	1.32	1.29	0.33	1.26	No	No	No	No	No	No	No	No	No	No
	705 S. Addison		705.53	706.70	705.66	2.00	0.83	1.87	1.94	0.77	1.81	No	No	No	No	No	No	No	No	No	No
	701 S. Addison		705.63	707.55	706.45	1.90	No	1.08	1.84	No	1.02	No	No	No	No	No	No	No	No	No	No
	637 S. Addison		706.50	707.43	706.58	1.03	0.10	0.95	0.97	0.04	0.89	No	No	No	No	No	No	No	No	No	No
	635 S. Addison		707.65	710.05	708.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	318 W. Madison		711.04	712.68	710.81	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	740 S. Wisconsin		709.97	713.44	712.20	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	738 S. Wisconsin		709.40	710.39	709.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	736 S. Wisconsin		708.99	709.88	709.08	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	728 S. Wisconsin		706.12	710.95	706.76	1.41	No	0.77	1.35	No	0.71	No	No	No	No	No	No	No	No	No	No
	726 S. Wisconsin		706.22	707.57	706.69	1.31	No	0.84	1.25	No	0.78	No	No	No	No	No	No	No	No	No	No
	722 S. Wisconsin		706.44	707.25	706.34	1.09	0.28	1.19	1.03	0.22	1.13	No	No	No	No	No	No	No	No	No	No
	718 S. Wisconsin		704.84	707.62	706.52	2.69	No	1.01	2.63	No	0.95	0.41	No	No	No	No	No	No	No	No	No
	710 S. Wisconsin		706.40	707.49	706.41	1.13	0.04	1.12	1.07	No	1.06	No	No	No	No	No	No	No	No	No	No
	702 S. Wisconsin		706.90	710.97	707.72	0.63	No	No	0.57	No	No	No	No	No	No	No	No	No	No	No	No
	648 S. Wisconsin		706.05	710.33	706.37	1.48	No	1.16	1.42	No	1.10	No	No	No	No	No	No	No	No	No	No
	644 S. Wisconsin		705.67	706.26	705.67	1.86	1.27	1.86	1.80	1.21	1.80	No	No	No	No	No	No	No	No	No	No
	640 S. Wisconsin		706.02	706.13	705.48	1.51	1.40	2.05	1.45	1.34	1.99	No	No	No	No	No	No	No	No	No	No
	636 S. Wisconsin		706.39	706.50	705.85	1.14	1.03	1.68	1.08	0.97	1.62	No	No	No	No	No	No	No	No	No	No
	632 S. Wisconsin		706.73	706.88	706.18	0.80	0.65	1.35	0.74	0.59	1.29	No	No	No	No	No	No	No	No	No	No
	Number of Houses with Depth of Flooding greater than 0 feet					22.00	13.00	19.00	22.00	11.00	19.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 1 foot					18.00	3.00	15.00	17.00	2.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 2 feet					6.00	0.00	1.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Houses Removed from Damage (Compared to Baseline)								0.00	2.00	0.00	18.00	13.00	19.00	22.00	13.00	19.00	22.00	13.00	19.00	

Node Information			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour						
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																		
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)			
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.13	705.14	707.51			707.46			706.41			702.31			704.30			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
	318 W. Madison		711.04	712.68	710.81	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	740 S. Wisconsin		709.97	713.44	712.20	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	738 S. Wisconsin		709.40	710.39	709.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	736 S. Wisconsin		708.99	709.88	709.08	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	728 S. Wisconsin		706.12	710.95	706.76	1.39	No	0.75	1.34	No	0.70	0.28	No	No	No	No	No	No	No	No	No
	726 S. Wisconsin		706.22	707.57	706.69	1.29	No	0.82	1.24	No	0.77	0.18	No	No	No	No	No	No	No	No	No
	722 S. Wisconsin		706.44	707.25	706.34	1.07	0.26	1.17	1.02	0.21	1.12	No	No	0.06	No	No	No	No	No	No	No
	718 S. Wisconsin		704.84	707.62	706.52	2.67	No	0.99	2.62	No	0.94	1.56	No	No	No	No	No	No	No	No	No
	710 S. Wisconsin		706.40	707.49	706.41	1.11	0.02	1.10	1.06	No	1.05	0.00	No	No	No	No	No	No	No	No	No
	702 S. Wisconsin		706.90	710.97	707.72	0.61	No	No	0.56	No	No	No	No	No	No	No	No	No	No	No	No
	648 S. Wisconsin		706.05	710.33	706.37	1.46	No	1.14	1.41	No	1.09	0.36	No	0.03	No	No	No	No	No	No	No
	644 S. Wisconsin		705.67	706.26	705.67	1.84	1.25	1.84	1.79	1.20	1.79	0.74	0.14	0.74	No	No	No	No	No	No	No
	640 S. Wisconsin		706.02	706.13	705.48	1.49	1.38	2.03	1.44	1.33	1.98	0.38	0.27	0.92	No	No	No	No	No	No	No
	636 S. Wisconsin		706.39	706.50	705.85	1.12	1.01	1.66	1.07	0.96	1.61	0.01	No	0.55	No	No	No	No	No	No	No
	632 S. Wisconsin		706.73	706.88	706.18	0.78	0.63	1.33	0.73	0.58	1.28	No	No	0.23	No	No	No	No	No	No	No
	741 S. Wisconsin		706.88	709.39	708.28	0.63	No	No	0.58	No	No	No	No	No	No	No	No	No	No	No	No
	737 S. Wisconsin		707.48	710.24	707.22	0.03	No	0.29	No	No	0.24	No	No	No	No	No	No	No	No	No	No
	733 S. Wisconsin		706.70	708.13	706.96	0.81	No	0.55	0.76	No	0.50	No	No	No	No	No	No	No	No	No	No
	729 S. Wisconsin		706.50	707.71	706.67	1.01	No	0.84	0.96	No	0.79	No	No	No	No	No	No	No	No	No	No
	725 S. Wisconsin		706.30	707.26	706.10	1.21	0.25	1.41	1.16	0.20	1.36	0.11	No	0.30	No	No	No	No	No	No	No
	721 S. Wisconsin		705.70	706.91	705.70	1.81	0.60	1.81	1.76	0.55	1.76	0.70	No	0.70	No	No	No	No	No	No	No
	717 S. Wisconsin		705.24	708.46	705.14	2.27	No	2.37	2.22	No	2.32	1.16	No	1.26	No	No	No	No	No	No	No
	711 S. Wisconsin		706.99	710.19	706.29	0.52	No	1.22	0.47	No	1.17	No	No	0.12	No	No	No	No	No	No	No
	709 S. Wisconsin		706.72	709.68	706.38	0.79	No	1.13	0.74	No	1.08	No	No	0.02	No	No	No	No	No	No	No
	649 S. Wisconsin		706.30	706.32	705.50	1.21	1.19	2.01	1.16	1.14	1.96	0.11	0.08	0.90	No	No	No	No	No	No	No
	645 S. Wisconsin		705.43	706.26	705.57	2.08	1.25	1.94	2.03	1.20	1.89	0.98	0.14	0.83	No	No	No	No	No	No	No
	641 S. Wisconsin		705.54	706.42	705.75	1.97	1.09	1.76	1.92	1.04	1.71	0.87	No	0.65	No	No	No	No	No	No	No
	637 S. Wisconsin		705.68	706.40	705.77	1.83	1.11	1.74	1.78	1.06	1.69	0.73	0.00	0.63	No	No	No	No	No	No	No
	633 S. Wisconsin		705.85	706.57	705.97	1.66	0.94	1.54	1.61	0.89	1.49	0.55	No	0.43	No	No	No	No	No	No	No
	629 S. Wisconsin		706.09	706.96	706.34	1.42	0.55	1.17	1.37	0.50	1.12	0.31	No	0.06	No	No	No	No	No	No	No
	625 S. Wisconsin		706.75	707.53	706.88	0.76	No	0.63	0.71	No	0.58	No	No	No	No	No	No	No	No	No	No
	621 S. Wisconsin		707.13	707.85	707.23	0.38	No	0.28	0.33	No	0.23	No	No	No	No	No	No	No	No	No	No
	617 S. Wisconsin		707.40	708.24	707.59	0.11	No	No	0.06	No	No	No	No	No	No	No	No	No	No	No	No
	Number of Houses with Depth of Flooding greater than 0 feet					29.00	14.00	26.00	28.00	13.00	26.00	17.00	5.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 1 foot					19.00	7.00	18.00	18.00	6.00	18.00	2.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 2 feet					3.00	0.00	3.00	3.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Houses Removed from Damage (Compared to Baseline)								1.00	1.00	0.00	12.00	9.00	9.00	29.00	14.00	26.00	29.00	14.00	26.00	

Node Information			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																	
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	706.26	704.42	705.13			705.11			704.78			703.19			701.59		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	741 S. Wisconsin		706.88	709.39	708.28	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	737 S. Wisconsin		707.48	710.24	707.22	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Wisconsin		706.70	708.13	706.96	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	729 S. Wisconsin		706.50	707.71	706.67	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	725 S. Wisconsin		706.30	707.26	706.10	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	721 S. Wisconsin		705.70	706.91	705.70	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	717 S. Wisconsin		705.24	708.46	705.14	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	711 S. Wisconsin		706.99	710.19	706.29	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	709 S. Wisconsin		706.72	709.68	706.38	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	649 S. Wisconsin		706.30	706.32	705.50	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	645 S. Wisconsin		705.43	706.26	705.57	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	641 S. Wisconsin		705.54	706.42	705.75	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	637 S. Wisconsin		705.68	706.40	705.77	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	633 S. Wisconsin		705.85	706.57	705.97	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	629 S. Wisconsin		706.09	706.96	706.34	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	625 S. Wisconsin		706.75	707.53	706.88	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	621 S. Wisconsin		707.13	707.85	707.23	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	617 S. Wisconsin		707.40	708.24	707.59	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	236 W. Madison		704.48	706.89	705.68	0.64	No	No	0.63	No	No	0.30	No	No	No	No	No	No	No	No
	738 S. Michigan		703.98	706.87	705.63	1.14	No	No	1.13	No	No	0.80	No	No	No	No	No	No	No	No
	734 S. Michigan		706.29	707.30	706.36	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	730 S. Michigan		706.25	708.60	707.86	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	726 S. Michigan		706.04	708.73	707.74	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	722 S. Michigan		705.83	708.58	707.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	718 S. Michigan		705.28	708.64	707.58	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	714 S. Michigan		707.05	707.07	705.79	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	710 S. Michigan		704.18	708.58	705.81	0.95	No	No	0.93	No	No	0.60	No	No	No	No	No	No	No	No
	706 S. Michigan		704.30	707.57	704.42	0.83	No	0.71	0.81	No	0.69	0.48	No	0.36	No	No	No	No	No	No
	702 S. Michigan		704.40	707.60	706.42	0.73	No	No	0.71	No	No	0.38	No	No	No	No	No	No	No	No
	644 S. Michigan		704.74	707.77	705.29	0.38	No	No	0.37	No	No	0.04	No	No	No	No	No	No	No	No
	640 S. Michigan		705.20	708.90	704.81	No	No	0.32	No	No	0.30	No	No	No	No	No	No	No	No	No
	636 S. Michigan		705.85	709.75	705.37	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	632 S. Michigan		706.13	710.35	706.26	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	630 S. Michigan		707.29	707.41	707.06	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						6.00	0.00	2.00	6.00	0.00	2.00	6.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	1.00	6.00	0.00	2.00	6.00	0.00	2.00

Node Information			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour						
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																		
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)			
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.69	706.50	707.32			707.30			707.26			705.51			705.03			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
	802 S. Wisconsin		708.70	708.75	707.68	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	816 S. Wisconsin		707.73	707.87	707.54	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	820 S. Wisconsin		708.20	709.53	708.86	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	824 S. Wisconsin		710.90	710.95	709.85	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	803 S. Wisconsin		708.42	708.40	707.36	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	815 S. Wisconsin		708.38	708.40	707.32	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	819 S. Wisconsin		706.34	708.44	707.35	0.98	No	No	0.96	No	No	0.92	No	No	No	No	No	No	No	No	No
	823 S. Wisconsin		708.54	708.55	707.42	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	827 S. Wisconsin		707.69	708.77	707.70	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	309 W. Madison		706.00	708.03	707.01	1.32	No	0.31	1.30	No	0.29	1.26	No	0.25	No	No	No	No	No	No	No
	305 W. Madison		705.95	707.69	706.50	1.37	No	0.82	1.35	No	0.80	1.31	No	0.76	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						3.00	0.00	2.00	3.00	0.00	2.00	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	2.00	3.00	0.00	2.00	
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	#N/A	#N/A	704.74			704.75			704.29			701.69			702.29			
						Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	
	245 W. Madison		706.17	707.15	706.88	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	241 W. Madison		705.38	706.62	705.74	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	237 W. Madison		704.70	706.34	705.27	0.04	No	No	0.05	No	No	No	No	No	No	No	No	No	No	No	No
	806 S. Michigan		704.20	706.44	705.12	0.54	No	No	0.55	No	No	0.09	No	No	No	No	No	No	No	No	No
	814 S. Michigan		702.38	704.59	703.39	2.36	0.15	1.35	2.37	0.16	1.36	1.91	No	0.90	No	No	No	No	No	No	No
	818 S. Michigan		703.34	704.16	703.15	1.40	0.58	1.59	1.41	0.59	1.60	0.95	0.13	1.14	No	No	No	No	No	No	No
	822 S. Michigan		702.70	705.07	703.99	2.04	No	0.75	2.05	No	0.76	1.59	No	0.30	No	No	No	No	No	No	No
	826 S. Michigan		703.10	704.06	703.20	1.64	0.68	1.54	1.65	0.69	1.55	1.19	0.23	1.09	No	No	No	No	No	No	No
	830 S. Michigan		704.92	705.61	704.47	No	No	0.27	No	No	0.28	No	No	No	No	No	No	No	No	No	No
	834 S. Michigan		704.00	704.45	704.08	0.74	0.29	0.66	0.75	0.30	0.67	0.29	No	0.21	No	No	No	No	No	No	No
	836 S. Michigan		705.12	706.12	704.61	No	No	0.13	No	No	0.14	No	No	No	No	No	No	No	No	No	No
	838 S. Michigan		706.35	710.13	706.04	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	801 S. Michigan		703.50	#N/A	#N/A	1.24			1.25			0.79			No	No	No	No	No	No	No
	815 S. Michigan		702.40	705.10	704.01	2.34	No	0.73	2.35	No	0.74	1.89	No	0.28	No	No	No	No	No	No	No
	819 S. Michigan		702.90	705.53	704.45	1.84	No	0.29	1.85	No	0.30	1.39	No	No	No	No	No	No	No	No	No
	823 S. Michigan		703.04	705.21	704.17	1.70	No	0.57	1.71	No	0.58	1.25	No	0.12	No	No	No	No	No	No	No
	827 S. Michigan		703.02	704.80	703.72	1.72	No	1.02	1.73	No	1.03	1.27	No	0.57	No	No	No	No	No	No	No
	831 S. Michigan		703.10	705.78	704.72	1.64	No	0.02	1.65	No	0.03	1.19	No	No	No	No	No	No	No	No	No
	833 S. Michigan		703.69	706.42	705.12	1.05	No	No	1.06	No	No	0.60	No	No	No	No	No	No	No	No	No
	835 S. Michigan		704.80	709.23	704.80	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	843 S. Michigan		705.33	708.05	706.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	223 W. Madison		704.70	707.43	706.30	0.04	No	No	0.05	No	No	No	No	No	No	No	No	No	No	No	No
	219 W. Madison		705.15	707.83	706.76	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						15.00	4.00	12.00	15.00	4.00	12.00	13.00	2.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						11.00	0.00	4.00	11.00	0.00	4.00	8.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						3.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	2.00	2.00	4.00	15.00	4.00	12.00	15.00	4.00	12.00	

Node Information			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																	
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	#N/A	#N/A	704.14			704.11			703.05			698.24			701.59		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	801 S. Michigan		703.50	#N/A	#N/A	0.64			0.61			No			No			No		
	815 S. Michigan		702.40	705.10	704.01	1.74	No	0.13	1.71	No	0.10	0.65	No	No	No	No	No	No	No	No
	819 S. Michigan		702.90	705.53	704.45	1.24	No	No	1.21	No	No	0.15	No	No	No	No	No	No	No	No
	823 S. Michigan		703.04	705.21	704.17	1.10	No	No	1.07	No	No	0.01	No	No	No	No	No	No	No	No
	827 S. Michigan		703.02	704.80	703.72	1.12	No	0.42	1.09	No	0.39	0.03	No	No	No	No	No	No	No	No
	831 S. Michigan		703.10	705.78	704.72	1.04	No	No	1.01	No	No	No	No	No	No	No	No	No	No	No
	833 S. Michigan		703.69	706.42	705.12	0.45	No	No	0.42	No	No	No	No	No	No	No	No	No	No	No
	835 S. Michigan		704.80	709.23	704.80	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	843 S. Michigan		705.33	708.05	706.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	223 W. Madison		704.70	707.43	706.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	219 W. Madison		705.15	707.83	706.76	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	215 W. Madison		703.44	708.20	707.05	0.70	No	No	0.67	No	No	No	No	No	No	No	No	No	No	No
	213 W. Madison		706.02	710.55	706.23	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	205 W. Madison		706.05	708.05	705.06	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	808 S. Harvard		704.70	#N/A	#N/A	No			No			No			No			No		
	814 S. Harvard		702.43	705.37	704.35	1.71	No	No	1.68	No	No	0.62	No	No	No	No	No	No	No	No
	818 S. Harvard		702.35	704.62	703.50	1.79	No	0.64	1.76	No	0.61	0.70	No	No	No	No	No	No	No	No
	822 S. Harvard		701.80	704.63	703.45	2.34	No	0.69	2.31	No	0.66	1.25	No	No	No	No	No	No	No	No
	824 S. Harvard		702.33	704.68	703.56	1.81	No	0.58	1.78	No	0.55	0.72	No	No	No	No	No	No	No	No
	826 S. Harvard		703.87	707.74	703.58	0.27	No	0.56	0.24	No	0.53	No	No	No	No	No	No	No	No	No
	828 S. Harvard		703.70	707.69	703.70	0.44	No	0.44	0.41	No	0.41	No	No	No	No	No	No	No	No	No
	830 S. Harvard		703.64	708.01	703.64	0.50	No	0.50	0.47	No	0.47	No	No	No	No	No	No	No	No	No
	842 S. Harvard		703.79	706.19	705.01	0.35	No	No	0.32	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						16.00	0.00	8.00	16.00	0.00	8.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						9.00	0.00	0.00	9.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	8.00	0.00	8.00	16.00	0.00	8.00	16.00	0.00	8.00

	100-year, 2-hour - Baseline			100-year, 2-hour - p1a - Increase			100-year, 2-hour - p1b - Relief			100-year, 2-hour - p1c - Relief			100-year, 2-hour - p1d - Buyout		
	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation
Number of Houses with Depth of Flooding greater than 0 feet	83.00	29.00	60.00	82.00	9.00	35.00	50.00	7.00	28.00	4.00	0.00	0.00	4.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot	51.00	9.00	33.00	48.00	8.00	32.00	13.00	0.00	3.00	1.00	0.00	0.00	1.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet	19.00	0.00	5.00	17.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)				1.00	20.00	25.00	33.00	22.00	32.00	79.00	29.00	60.00	79.00	29.00	60.00

LEGEND

- High Water Elevation greater than 2 feet above Low Opening / Finished Floor / Top of Foundation
- High Water Elevation greater than 1 foot above Low Opening / Finished Floor / Top of Foundation
- High Water Elevation less than 1 foot above Low Opening / Finished Floor / Top of Foundation

SUGAR CREEK WATERSHED STORM SEWER ANALYSIS
Damage Analysis - 10 year, 2-hour storm events - PROBLEM AREA 1

March 27, 2015

Node Information			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation			Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
			Low Opening	F/F	T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
Node377	Low Point on Addison and north of Washington	708.73	709.30	#N/A	#N/A	709.74			709.66			708.97			708.97			708.97		
	342 E. Washington Street		709.30	#N/A	#N/A	0.44			0.36			No			No			No		
	537 S. Addison Avenue		710.30	#N/A	#N/A	No			No			No			No			No		
	533 S. Addison Avenue		712.30	#N/A	#N/A	No			No			No			No			No		
	529 S. Addison Avenue		712.80	#N/A	#N/A	No			No			No			No			No		
	1144 Washington		710.10	#N/A	#N/A	No			No			No			No			No		
	432 S. Addison Avenue		710.50	#N/A	#N/A	No			No			No			No			No		
	430 S. Addison Avenue		712.50	#N/A	#N/A	No			No			No			No			No		
	420 S. Addison Avenue		713.40	#N/A	#N/A	No			No			No			No			No		
Number of Houses with Depth of Flooding greater than 0 feet			1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)						0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
S48-02	Low Point on Adidson (North of Madison)	701.77	704.74	706.11	705.42	706.56			706.59			700.43			699.42			700.10		
	1148 E. Madison		709.47	711.67	710.17	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	556 S. Addison		707.27	709.75	709.00	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	552 S. Addison		706.52	706.11	705.42	0.04	0.45	1.14	0.07	0.48	1.17	No	No	No	No	No	No	No	No	No
	550 S. Addison		705.34	706.37	705.92	1.22	0.19	0.64	1.25	0.22	0.67	No	No	No	No	No	No	No	No	No
	548 S. Addison		706.25	707.37	706.04	0.31	No	0.52	0.34	No	0.55	No	No	No	No	No	No	No	No	No
	544 S. Addison		708.22	709.20	708.00	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	540 S. Addison		706.37	710.36	709.32	0.19	No	No	0.22	No	No	No	No	No	No	No	No	No	No	No
	536 S. Addison		707.23	707.23	709.31	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	532 S. Addison		709.60	712.97	709.68	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	342 W. Madison		705.90	709.71	708.76	0.66	No	No	0.69	No	No	No	No	No	No	No	No	No	No	No
	338 W. Madison		709.92	710.97	709.89	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	334 W. Madison		708.77	711.50	710.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Addison		705.10	707.49	706.33	1.46	No	0.23	1.49	No	0.26	No	No	No	No	No	No	No	No	No
	729 S. Addison		704.74	707.06	705.91	1.82	No	0.65	1.85	No	0.68	No	No	No	No	No	No	No	No	No
	725 S. Addison		704.75	706.75	705.68	1.81	No	0.88	1.84	No	0.91	No	No	No	No	No	No	No	No	No
	721 S. Addison		707.06	707.00	705.74	No	No	0.82	No	No	0.85	No	No	No	No	No	No	No	No	No
	715 S. Addison		705.40	708.51	707.42	1.16	No	No	1.19	No	No	No	No	No	No	No	No	No	No	No
	713 S. Addison		707.36	709.50	708.65	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	709 S. Addison		706.18	707.14	706.21	0.38	No	0.35	0.41	No	0.38	No	No	No	No	No	No	No	No	No
	705 S. Addison		705.53	706.70	705.66	1.03	No	0.90	1.06	No	0.93	No	No	No	No	No	No	No	No	No
	701 S. Addison		705.63	707.55	706.45	0.93	No	0.11	0.96	No	0.14	No	No	No	No	No	No	No	No	No
	637 S. Addison		706.50	707.43	706.58	0.06	No	No	0.09	No	0.01	No	No	No	No	No	No	No	No	No
	635 S. Addison		707.65	710.05	708.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet			13.00	2.00	10.00	13.00	2.00	10.00	13.00	2.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot			6.00	0.00	1.00	6.00	0.00	1.00	6.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)						0.00	0.00	0.00	13.00	2.00	10.00	13.00	2.00	10.00	13.00	2.00	10.00	13.00	2.00	10.00

Node Information			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																	
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
Node373	Low Point between Addison and Wisconsin (North of Madison)	702.10	704.74	706.13	705.48	706.56			706.59			703.93			700.09			700.10		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	342 W. Madison		705.90	709.71	708.76	0.66	No	No	0.69	No	No	No	No	No	No	No	No	No	No	No
	338 W. Madison		709.92	710.97	709.89	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	334 W. Madison		708.77	711.50	710.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Addison		705.10	707.49	706.33	1.46	No	0.23	1.49	No	0.26	No	No	No	No	No	No	No	No	No
	729 S. Addison		704.74	707.06	705.91	1.82	No	0.65	1.85	No	0.68	No	No	No	No	No	No	No	No	No
	725 S. Addison		704.75	706.75	705.68	1.81	No	0.88	1.84	No	0.91	No	No	No	No	No	No	No	No	No
	721 S. Addison		707.06	707.00	705.74	No	No	0.82	No	No	0.85	No	No	No	No	No	No	No	No	No
	715 S. Addison		705.40	708.51	707.42	1.16	No	No	1.19	No	No	No	No	No	No	No	No	No	No	No
	713 S. Addison		707.36	709.50	708.65	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	709 S. Addison		706.18	707.14	706.21	0.38	No	0.35	0.41	No	0.38	No	No	No	No	No	No	No	No	No
	705 S. Addison		705.53	706.70	705.66	1.03	No	0.90	1.06	No	0.93	No	No	No	No	No	No	No	No	No
	701 S. Addison		705.63	707.55	706.45	0.93	No	0.11	0.96	No	0.14	No	No	No	No	No	No	No	No	No
	637 S. Addison		706.50	707.43	706.58	0.06	No	No	0.09	No	0.01	No	No	No	No	No	No	No	No	No
	635 S. Addison		707.65	710.05	708.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	318 W. Madison		711.04	712.68	710.81	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	740 S. Wisconsin		709.97	713.44	712.20	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	738 S. Wisconsin		709.40	710.39	709.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	736 S. Wisconsin		708.99	709.88	709.08	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	728 S. Wisconsin		706.12	710.95	706.76	0.44	No	No	0.47	No	No	No	No	No	No	No	No	No	No	No
	726 S. Wisconsin		706.22	707.57	706.69	0.34	No	No	0.37	No	No	No	No	No	No	No	No	No	No	No
	722 S. Wisconsin		706.44	707.25	706.34	0.12	No	0.22	0.15	No	0.25	No	No	No	No	No	No	No	No	No
	718 S. Wisconsin		704.84	707.62	706.52	1.72	No	0.04	1.75	No	0.07	No	No	No	No	No	No	No	No	No
	710 S. Wisconsin		706.40	707.49	706.41	0.16	No	0.15	0.19	No	0.18	No	No	No	No	No	No	No	No	No
	702 S. Wisconsin		706.90	710.97	707.72	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	648 S. Wisconsin		706.05	710.33	706.37	0.51	No	0.19	0.54	No	0.22	No	No	No	No	No	No	No	No	No
	644 S. Wisconsin		705.67	706.26	705.67	0.89	0.30	0.89	0.92	0.33	0.92	No	No	No	No	No	No	No	No	No
	640 S. Wisconsin		706.02	706.13	705.48	0.54	0.43	1.08	0.57	0.46	1.11	No	No	No	No	No	No	No	No	No
	636 S. Wisconsin		706.39	706.50	705.85	0.17	0.06	0.71	0.20	0.09	0.74	No	No	No	No	No	No	No	No	No
	632 S. Wisconsin		706.73	706.88	706.18	No	No	0.38	No	No	0.41	No	No	No	No	No	No	No	No	No
	Number of Houses with Depth of Flooding greater than 0 feet					18.00	3.00	15.00	18.00	3.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 1 foot					6.00	0.00	1.00	6.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 2 feet					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Houses Removed from Damage (Compared to Baseline)								0.00	0.00	-1.00	18.00	3.00	15.00	18.00	3.00	15.00	18.00	3.00	15.00

Node Information				10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour						
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																			
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)				
S03-01	Low Point on Wisconsin (North of Madison)	704.00	704.84	706.13	705.14	706.56			706.59			704.11			701.17			701.04				
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F		
	318 W. Madison		711.04	712.68	710.81	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	740 S. Wisconsin		709.97	713.44	712.20	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	738 S. Wisconsin		709.40	710.39	709.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	736 S. Wisconsin		708.99	709.88	709.08	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	728 S. Wisconsin		706.12	710.95	706.76	0.44	No	No	0.47	No	No	No	No	No	No	No	No	No	No	No	No	
	726 S. Wisconsin		706.22	707.57	706.69	0.34	No	No	0.37	No	No	No	No	No	No	No	No	No	No	No	No	
	722 S. Wisconsin		706.44	707.25	706.34	0.12	No	0.22	0.15	No	0.25	No	No	No	No	No	No	No	No	No	No	
	718 S. Wisconsin		704.84	707.62	706.52	1.72	No	0.04	1.75	No	0.07	No	No	No	No	No	No	No	No	No	No	
	710 S. Wisconsin		706.40	707.49	706.41	0.16	No	0.15	0.19	No	0.18	No	No	No	No	No	No	No	No	No	No	
	702 S. Wisconsin		706.90	710.97	707.72	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	648 S. Wisconsin		706.05	710.33	706.37	0.51	No	0.19	0.54	No	0.22	No	No	No	No	No	No	No	No	No	No	
	644 S. Wisconsin		705.67	706.26	705.67	0.89	0.30	0.89	0.92	0.33	0.92	No	No	No	No	No	No	No	No	No	No	
	640 S. Wisconsin		706.02	706.13	705.48	0.54	0.43	1.08	0.57	0.46	1.11	No	No	No	No	No	No	No	No	No	No	
	636 S. Wisconsin		706.39	706.50	705.85	0.17	0.06	0.71	0.20	0.09	0.74	No	No	No	No	No	No	No	No	No	No	
	632 S. Wisconsin		706.73	706.88	706.18	No	No	0.38	No	No	0.41	No	No	No	No	No	No	No	No	No	No	
	741 S. Wisconsin		706.88	709.39	708.28	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	737 S. Wisconsin		707.48	710.24	707.22	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	733 S. Wisconsin		706.70	708.13	706.96	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	729 S. Wisconsin		706.50	707.71	706.67	0.06	No	No	0.09	No	No	No	No	No	No	No	No	No	No	No	No	
	725 S. Wisconsin		706.30	707.26	706.10	0.26	No	0.46	0.29	No	0.49	No	No	No	No	No	No	No	No	No	No	
	721 S. Wisconsin		705.70	706.91	705.70	0.86	No	0.86	0.89	No	0.89	No	No	No	No	No	No	No	No	No	No	
	717 S. Wisconsin		705.24	708.46	705.14	1.32	No	1.42	1.35	No	1.45	No	No	No	No	No	No	No	No	No	No	
	711 S. Wisconsin		706.99	710.19	706.29	No	No	0.27	No	No	0.30	No	No	No	No	No	No	No	No	No	No	
	709 S. Wisconsin		706.72	709.68	706.38	No	No	0.18	No	No	0.21	No	No	No	No	No	No	No	No	No	No	
	649 S. Wisconsin		706.30	706.32	705.50	0.26	0.24	1.06	0.29	0.27	1.09	No	No	No	No	No	No	No	No	No	No	
	645 S. Wisconsin		705.43	706.26	705.57	1.13	0.30	0.99	1.16	0.33	1.02	No	No	No	No	No	No	No	No	No	No	
	641 S. Wisconsin		705.54	706.42	705.75	1.02	0.14	0.81	1.05	0.17	0.84	No	No	No	No	No	No	No	No	No	No	
	637 S. Wisconsin		705.68	706.40	705.77	0.88	0.16	0.79	0.91	0.19	0.82	No	No	No	No	No	No	No	No	No	No	
	633 S. Wisconsin		705.85	706.57	705.97	0.71	No	0.59	0.74	0.02	0.62	No	No	No	No	No	No	No	No	No	No	
	629 S. Wisconsin		706.09	706.96	706.34	0.47	No	0.22	0.50	No	0.25	No	No	No	No	No	No	No	No	No	No	
	625 S. Wisconsin		706.75	707.53	706.88	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	621 S. Wisconsin		707.13	707.85	707.23	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	617 S. Wisconsin		707.40	708.24	707.59	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
	Number of Houses with Depth of Flooding greater than 0 feet					19.00	7.00	19.00	19.00	8.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Number of Houses with Depth of Flooding greater than 1 foot					4.00	0.00	3.00	4.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Number of Houses with Depth of Flooding greater than 2 feet					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Houses Removed from Damage (Compared to Baseline)								0.00	-1.00	0.00	19.00	7.00	19.00	19.00	7.00	19.00	19.00	7.00	19.00	0.00	

Node Information				10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour				
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																	
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
S03-04	Low Point between Wisconsin and Michigan (North of Madison)	702.00	703.98	706.26	704.42	704.73			704.72			704.19			695.95			699.80		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	741 S. Wisconsin		706.88	709.39	708.28	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	737 S. Wisconsin		707.48	710.24	707.22	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	733 S. Wisconsin		706.70	708.13	706.96	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	729 S. Wisconsin		706.50	707.71	706.67	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	725 S. Wisconsin		706.30	707.26	706.10	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	721 S. Wisconsin		705.70	706.91	705.70	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	717 S. Wisconsin		705.24	708.46	705.14	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	711 S. Wisconsin		706.99	710.19	706.29	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	709 S. Wisconsin		706.72	709.68	706.38	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	649 S. Wisconsin		706.30	706.32	705.50	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	645 S. Wisconsin		705.43	706.26	705.57	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	641 S. Wisconsin		705.54	706.42	705.75	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	637 S. Wisconsin		705.68	706.40	705.77	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	633 S. Wisconsin		705.85	706.57	705.97	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	629 S. Wisconsin		706.09	706.96	706.34	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	625 S. Wisconsin		706.75	707.53	706.88	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	621 S. Wisconsin		707.13	707.85	707.23	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	617 S. Wisconsin		707.40	708.24	707.59	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	236 W. Madison		704.48	706.89	705.68	0.25	No	No	0.24	No	No	No	No	No	No	No	No	No	No	No
	738 S. Michigan		703.98	706.87	705.63	0.75	No	No	0.74	No	No	0.21	No	No	No	No	No	No	No	No
	734 S. Michigan		706.29	707.30	706.36	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	730 S. Michigan		706.25	708.60	707.86	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	726 S. Michigan		706.04	708.73	707.74	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	722 S. Michigan		705.83	708.58	707.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	718 S. Michigan		705.28	708.64	707.58	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	714 S. Michigan		707.05	707.07	705.79	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	710 S. Michigan		704.18	708.58	705.81	0.55	No	No	0.54	No	No	0.01	No	No	No	No	No	No	No	No
	706 S. Michigan		704.30	707.57	704.42	0.43	No	0.31	0.42	No	0.30	No	No	No	No	No	No	No	No	No
	702 S. Michigan		704.40	707.60	706.42	0.33	No	No	0.32	No	No	No	No	No	No	No	No	No	No	No
	644 S. Michigan		704.74	707.77	705.29	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	640 S. Michigan		705.20	708.90	704.81	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	636 S. Michigan		705.85	709.75	705.37	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	632 S. Michigan		706.13	710.35	706.26	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	630 S. Michigan		707.29	707.41	707.06	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						5.00	0.00	1.00	5.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	3.00	0.00	1.00	5.00	0.00	1.00	5.00	0.00	1.00

Node Information				10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																		
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)			
WS-01	Low Point on Wisconsin (South of Madison)	705.50	705.95	707.69	706.50	707.17			707.17			707.17			705.51			700.99			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
	802 S. Wisconsin		708.70	708.75	707.68	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	816 S. Wisconsin		707.73	707.87	707.54	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	820 S. Wisconsin		708.20	709.53	708.86	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	824 S. Wisconsin		710.90	710.95	709.85	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	803 S. Wisconsin		708.42	708.40	707.36	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	815 S. Wisconsin		708.38	708.40	707.32	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	819 S. Wisconsin		706.34	708.44	707.35	0.83	No	No	0.83	No	No	0.83	No	No	No	No	No	No	No	No	No
	823 S. Wisconsin		708.54	708.55	707.42	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	827 S. Wisconsin		707.69	708.77	707.70	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	309 W. Madison		706.00	708.03	707.01	1.17	No	0.16	1.17	No	0.16	1.17	No	0.16	No	No	No	No	No	No	No
	305 W. Madison		705.95	707.69	706.50	1.22	No	0.67	1.22	No	0.67	1.22	No	0.67	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						3.00	0.00	2.00	3.00	0.00	2.00	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	2.00	3.00	0.00	2.00	
MS-01	Low Point on Michigan (South of Madison)	702.00	702.38	#N/A	#N/A	703.70			703.70			703.39			701.51			701.51			
						Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	Low Opening	F/F	T/F	
	245 W. Madison		706.17	707.15	706.88	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	241 W. Madison		705.38	706.62	705.74	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	237 W. Madison		704.70	706.34	705.27	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	806 S. Michigan		704.20	706.44	705.12	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	814 S. Michigan		702.38	704.59	703.39	1.32	No	0.31	1.32	No	0.31	1.01	No	0.00	No	No	No	No	No	No	No
	818 S. Michigan		703.34	704.16	703.15	0.36	No	0.55	0.36	No	0.55	0.05	No	0.24	No	No	No	No	No	No	No
	822 S. Michigan		702.70	705.07	703.99	1.00	No	No	1.00	No	No	0.69	No	No	No	No	No	No	No	No	No
	826 S. Michigan		703.10	704.06	703.20	0.60	No	0.50	0.60	No	0.50	0.29	No	0.19	No	No	No	No	No	No	No
	830 S. Michigan		704.92	705.61	704.47	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	834 S. Michigan		704.00	704.45	704.08	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	836 S. Michigan		705.12	706.12	704.61	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	838 S. Michigan		706.35	710.13	706.04	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	801 S. Michigan		703.50	#N/A	#N/A	0.20			0.20			No			No			No			
	815 S. Michigan		702.40	705.10	704.01	1.30	No	No	1.30	No	No	0.99	No	No	No	No	No	No	No	No	No
	819 S. Michigan		702.90	705.53	704.45	0.80	No	No	0.80	No	No	0.49	No	No	No	No	No	No	No	No	No
	823 S. Michigan		703.04	705.21	704.17	0.66	No	No	0.66	No	No	0.35	No	No	No	No	No	No	No	No	No
	827 S. Michigan		703.02	704.80	703.72	0.68	No	No	0.68	No	No	0.37	No	No	No	No	No	No	No	No	No
	831 S. Michigan		703.10	705.78	704.72	0.60	No	No	0.60	No	No	0.29	No	No	No	No	No	No	No	No	No
	833 S. Michigan		703.69	706.42	705.12	0.01	No	No	0.01	No	No	No	No	No	No	No	No	No	No	No	No
	835 S. Michigan		704.80	709.23	704.80	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	843 S. Michigan		705.33	708.05	706.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	223 W. Madison		704.70	707.43	706.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	219 W. Madison		705.15	707.83	706.76	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						11.00	0.00	3.00	11.00	0.00	3.00	9.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						3.00	0.00	0.00	3.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	2.00	0.00	0.00	11.00	0.00	3.00	11.00	0.00	3.00	

Node Information			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour					
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation																	
			Low Opening	F/F	T/F	Baseline Peak Elevation			Proposed Peak Elevation (p1a - Increase Inlet Capacity at Addison and Madison)			Proposed Peak Elevation (p1b - Relief Sewer to Jackson Middle School)			Proposed Peak Elevation (p1c - Relief Sewer to Jackson Middle School and Willowbrook HS and Backyard Storm Drains)			Proposed Peak Elevation (p1d - Buyout homes in two locations for detention)		
MS-02	Low Point between Michigan and Harvard (South of Madison)	699.24	701.80	#N/A	#N/A	702.19			702.19			701.62			695.78			697.30		
			Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	801 S. Michigan		703.50	#N/A	#N/A	No			No			No			No			No		
	815 S. Michigan		702.40	705.10	704.01	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	819 S. Michigan		702.90	705.53	704.45	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	823 S. Michigan		703.04	705.21	704.17	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	827 S. Michigan		703.02	704.80	703.72	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	831 S. Michigan		703.10	705.78	704.72	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	833 S. Michigan		703.69	706.42	705.12	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	835 S. Michigan		704.80	709.23	704.80	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	843 S. Michigan		705.33	708.05	706.92	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	223 W. Madison		704.70	707.43	706.30	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	219 W. Madison		705.15	707.83	706.76	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	215 W. Madison		703.44	708.20	707.05	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	213 W. Madison		706.02	710.55	706.23	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	205 W. Madison		706.05	708.05	705.06	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	808 S. Harvard		704.70	#N/A	#N/A	No			No			No			No			No		
	814 S. Harvard		702.43	705.37	704.35	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	818 S. Harvard		702.35	704.62	703.50	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	822 S. Harvard		701.80	704.63	703.45	0.39	No	No	0.39	No	No	No	No	No	No	No	No	No	No	No
	824 S. Harvard		702.33	704.68	703.56	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	826 S. Harvard		703.87	707.74	703.58	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	828 S. Harvard		703.70	707.69	703.70	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	830 S. Harvard		703.64	708.01	703.64	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	842 S. Harvard		703.79	706.19	705.01	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Houses with Depth of Flooding greater than 0 feet						1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00

	10-year, 2-hour - Baseline			10-year, 2-hour - p1a - Increase			10-year, 2-hour - p1b - Relief			10-year, 2-hour - p1c - Relief			10-year, 2-hour - p1d - Buyout		
	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation
Number of Houses with Depth of Flooding greater than 0 feet	53.00	9.00	35.00	53.00	9.00	35.00	14.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot	15.00	0.00	4.00	15.00	0.00	5.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)				0.00	0.00	0.00	39.00	9.00	30.00	53.00	9.00	35.00	53.00	9.00	35.00

LEGEND

- High Water Elevation greater than 2 feet above Low Opening / Finished Floor / Top of Foundation
- High Water Elevation greater than 1 foot above Low Opening / Finished Floor / Top of Foundation
- High Water Elevation less than 1 foot above Low Opening / Finished Floor / Top of Foundation

SUGAR CREEK WATERSHED STORM SEWER ANALYSIS
Damage Analysis - 100year, 2-hour storm events - PROBLEM AREA 3

March 27, 2015

Node Information						100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour		
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation			Baseline			p3a - Raise Rand Road and route runoff east and south			p3b - Increase collection capacity within Rand Road and convey to Lufkin Pond			p3c - Buyout 1027 Rand Road		
			Low Opening	F/F	T/F	Baseline			p3a			p3b			p3c		
R1657	At 1027 Rand Road		678.50	#N/A	#N/A	679.15			678.43			678.50			678.63		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	1011 S. Rand Road		680.50	#N/A	#N/A	No			No			No			No		
	1015 S. Rand Road		679.20	#N/A	#N/A	No			No			No			No		
	1021 S. Rand Road		680.05	679.17	679.04	No	No	0.11	No	No	No	No	No	No	No	No	No
	1027 S. Rand Road		678.50	678.61	678.61	0.65	0.54	0.54	No	No	No	No	No	No	House Buyout		
	1033 S. Rand Road		679.09	679.09	679.09	0.06	0.06	0.06	No	No	No	No	No	No	No	No	No
	1037 S. Rand Road		678.73	680.09	679.04	0.42	No	0.11	No	No	No	No	No	No	No	No	No
	1032 S. Rand Road		680.20	#N/A	#N/A	No			No			No			No		
	1028 S. Rand Road		681.78	683.17	682.07	No	No	No	No	No	No	No	No	No	No	No	No
	1024 S. Rand Road		682.80	#N/A	#N/A	No			No			No			No		
	1020 S. Rand Road		679.30	#N/A	#N/A	No			No			No			No		
	1016 S. Rand Road		679.70	#N/A	#N/A	No			No			No			No		
	1012 S. Rand Road		681.40	#N/A	#N/A	No			No			No			No		
Number of Houses with Depth of Flooding greater than 0 feet						3.00	2.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									3.00	2.00	4.00	3.00	2.00	4.00	3.00	2.00	4.00
			Low Opening	F/F	T/F	Baseline			p3a			p3b			p3c		
R1641	Intersection of Rand Road and Willow Crest Road		678.15	#N/A	#N/A	678.76			677.98			678.08			678.17		
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F
	1141 S. Rand Road		678.70	#N/A	#N/A	0.06			No			No			No		
	1047 S. Rand Road		678.70	#N/A	#N/A	0.06			No			No			No		
	1101 S. Rand Road		678.38	680.36	679.18	0.38	No	No	No	No	No	No	No	No	No	No	No
	102 W. Rand Road		679.02	680.72	679.61	No	No	No	No	No	No	No	No	No	No	No	No
	1036 S. Rand Road		680.70	#N/A	#N/A	No			No			No			No		
	1040 S. Rand Road		680.72	682.35	680.72	No	No	No	No	No	No	No	No	No	No	No	No
	1046 S. Rand Road		679.87	681.46	680.36	No	No	No	No	No	No	No	No	No	No	No	No
	1100 S. Rand Road		678.80	682.57	679.84	No	No	No	No	No	No	No	No	No	No	No	No
	1104 S. Rand Road		678.60	681.84	678.55	0.16	No	0.21	No	No	No	No	No	No	No	No	No
	1108 S. Rand Road		678.15	679.08	678.04	0.61	No	0.72	No	No	No	No	No	0.04	0.02	No	0.13
	103 W. Rand Road		678.70	#N/A	#N/A	0.06			No			No			No		
Number of Houses with Depth of Flooding greater than 0 feet						6.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									6.00	0.00	2.00	6.00	0.00	1.00	5.00	0.00	1.00

Node Information						100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			100-year, 2-hour			
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation			Baseline			p3a - Raise Rand Road and route runoff east and south			p3b - Increase collection capacity within Rand Road and convey to Lufkin Pond			p3c - Buyout 1027 Rand Road			
			Low Opening	F/F	T/F	Baseline			p3a			p3b			p3c			
J-01	Structure at Northwest Corner of Jackson and Rand Road		688.40	#N/A	#N/A	688.41			689.16			688.23			688.21			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
	35 W. Jackson		688.40	#N/A	#N/A	N/A - Overflow builds on north side of crown. Homes are on south.			Sidewalk to be elevated to protect homes			N/A - Overflow builds on north side of crown. Homes are on south.			N/A - Overflow builds on north side of crown. Homes are on south.			
	31 W. Jackson		688.50	#N/A	#N/A													
Number of Houses with Depth of Flooding greater than 0 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	100-year, 2-hour - Baseline			100-year, 2-hour - p3a - Raise			100-year, 2-hour - p3b - Increase			100-year, 2-hour - p3c - Buyout		
	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation
Number of Houses with Depth of Flooding greater than 0 feet	9.00	2.00	6.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00
Number of Houses with Depth of Flooding greater than 1 foot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)				9.00	2.00	6.00	9.00	2.00	5.00	8.00	2.00	5.00

LEGEND

	High Water Elevation greater than 2 feet above Low Opening / Finished Floor / Top of Foundation
	High Water Elevation greater than 1 foot above Low Opening / Finished Floor / Top of Foundation
	High Water Elevation less than 1 foot above Low Opening / Finished Floor / Top of Foundation

Node Information						10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			10-year, 2-hour			
XPSWMM ID	Approximate Location	Rim / Bottom / NWL Elevation	Approximate Damage Elevation			Baseline			p3a - Raise Rand Road and route runoff east and south			p3b - Increase collection capacity within Rand Road and convey to Lufkin Pond			p3c - Buyout 1027 Rand Road			
			Low Opening	F/F	T/F	Baseline			p3a			p3b			p3c			
						Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	Depth to Low Opening	Depth to F/F	Depth to T/F	
J-01	Structure at Northwest Corner of Jackson and Rand Road		688.40	#N/A	#N/A	688.14			688.65			687.86			687.85			
	35 W. Jackson		688.40	#N/A	#N/A	N/A - Overflow builds on north side of crown. Homes are on south.			Sidewalk to be elevated to protect homes			N/A - Overflow builds on north side of crown. Homes are on south.			N/A - Overflow builds on north side of crown. Homes are on south.			
	31 W. Jackson		688.50	#N/A	#N/A													
Number of Houses with Depth of Flooding greater than 0 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	10-year, 2-hour - Baseline			10-year, 2-hour - p3a - Raise Rand			10-year, 2-hour - p3b - Increase			10-year, 2-hour - p3c - Buyout		
	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation	Low Opening	Finished Floor	Top of Foundation
Number of Houses with Depth of Flooding greater than 0 feet	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 1 foot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of Houses with Depth of Flooding greater than 2 feet	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Houses Removed from Damage (Compared to Baseline)				1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00

LEGEND

	High Water Elevation greater than 2 feet above Low Opening / Finished Floor / Top of Foundation
	High Water Elevation greater than 1 foot above Low Opening / Finished Floor / Top of Foundation
	High Water Elevation less than 1 foot above Low Opening / Finished Floor / Top of Foundation

SUGAR CREEK WATERSHED STORM SEWER ANALYSIS
SUGAR CREEK ELEVATION AND FLOW COMPARISONS

March 27, 2015

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p1a																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.91	0%	358.65	358.65	0%	378.84	378.85	0%	433.36	433.35	0%	458.98	459.00	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.99	0%	663.18	663.18	0%	664.17	664.16	0%	664.20	664.20	0%	664.62	664.61	0%	664.54	664.54	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	361.11	0%	378.28	378.36	0%	576.92	574.27	0%	571.26	571.23	0%	768.61	766.11	0%	700.06	699.16	0%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p1b																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.87	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.00	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.99	0%	663.18	663.12	0%	664.17	664.17	0%	664.20	664.17	0%	664.62	664.61	0%	664.54	664.55	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	360.39	-1%	378.28	374.65	-1%	576.92	569.63	-1%	571.26	562.26	-2%	768.61	758.82	-1%	700.06	709.07	1%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p1c																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.10	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.87	0%	358.65	358.65	0%	378.84	379.04	0%	433.36	433.36	0%	458.98	456.20	-1%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.98	0%	663.18	663.12	0%	664.17	664.17	0%	664.20	664.17	0%	664.62	664.50	0%	664.54	664.52	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	361.31	0%	378.28	374.53	-1%	576.92	570.35	-1%	571.26	563.98	-1%	768.61	706.15	-8%	700.06	694.18	-1%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p1d																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.87	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.01	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.97	0%	663.18	663.17	0%	664.17	664.17	0%	664.20	664.19	0%	664.62	664.61	0%	664.54	664.50	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	362.14	0%	378.28	377.36	0%	576.92	574.54	0%	571.26	569.00	0%	768.61	764.49	-1%	700.06	677.21	-3%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p2																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.89	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.01	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	663.00	0%	663.18	663.18	0%	664.17	664.18	0%	664.20	664.21	0%	664.62	664.62	0%	664.54	664.54	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	359.38	-1%	378.28	378.53	0%	576.92	572.37	-1%	571.26	571.83	0%	768.61	765.59	0%	700.06	695.07	-1%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p3a																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.87	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.02	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.94	0%	663.18	663.17	0%	664.17	664.04	0%	664.20	664.18	0%	664.62	664.36	0%	664.54	664.51	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	357.30	-2%	378.28	375.81	-1%	576.92	537.03	-7%	571.26	563.58	-1%	768.61	650.17	-15%	700.06	684.86	-2%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p3b																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.89	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.00	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.96	0%	663.18	663.17	0%	664.17	664.08	0%	664.20	664.19	0%	664.62	664.54	0%	664.54	664.52	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	356.57	-2%	378.28	376.16	-1%	576.92	539.71	-6%	571.26	564.47	-1%	768.61	715.12	-7%	700.06	686.65	-2%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p3c																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.88	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.01	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	662.95	0%	663.18	663.17	0%	664.17	664.06	0%	664.20	664.18	0%	664.62	664.52	0%	664.54	664.51	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	358.66	-1%	378.28	375.88	-1%	576.92	541.75	-6%	571.26	563.61	-1%	768.61	715.87	-7%	700.06	685.70	-2%

			10-year, 2-hour			10-year, 24-hour			50-year, 2-hour			50-year, 24-hour			100-year, 2-hour			100-year, 24-hour		
			Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change
Proposed Alternative p4a																				
SW-2295	South side of Willowbrook High School	High Water Elevation	677.09	677.09	0%	677.18	677.18	0%	677.54	677.54	0%	677.65	677.65	0%	677.88	677.88	0%	678.02	678.02	0%
L_C1165	Sugar Creek from south side of Willowbrook HS to Ardmore Avenue	Peak Flow Rate	269.05	269.05	0%	285.89	285.88	0%	358.65	358.65	0%	378.84	378.84	0%	433.36	433.36	0%	458.98	459.02	0%
SW-2262	At Sugar Creek and Cross Street	High Water Elevation	662.98	663.07	0%	663.18	663.18	0%	664.17	664.32	0%	664.20	664.22	0%	664.62	664.74	0%	664.54	664.55	0%
L_C986	Sugar Creek from Cross Street to Villa Avenue	Peak Flow Rate	362.82	378.27	4%	378.28	378.90	0%	576.92	645.08	12%	571.26	580.84	2%	768.61	853.19	11%	700.06	704.65	1%