COMMONWEALTH ENGINEERS, INC.™
A wealth of resources to master a common goal.

Town of Daleville

Wastewater and Stormwater Utility Improvements
Preliminary Engineering Report
June 2019

A Wealth of Resources to Master a Common Goal.

PROJECT: D18136

TABLE OF CONTENTS

Tables

Figures

APPENDICES

List of Resources

N/A	Raintree Estates Plans
1978	Sanitary Sewer System Record Drawings
1993	Strom Sewer System improvements
1994	Water Distribution System Improvements
1995	SR 67 Water main Extension As-Built
1997	Water Distribution System As-Builts
2002	SR 67 WM Extension
2008	Vic Power's Inc. Smoke Test
2012	Road Rehab Plans
2013	Daleville, Indiana Sewer Collection System Assessment
2014	Storm Sewer Improvements As-builts
2016	DCRWD and LRWD PER

Executive Summary

This State Revolving Fund (SRF) Preliminary Engineering Report (PER) has been converted from a wastewater and stormwater utility master plan for the Town of Daleville and provides an analysis and recommendation for improvements to Daleville's stormwater system. It is the intent for these improvements to reduce infiltration and inflow (I/I) to the wastewater system as well. The intent of this report is to obtain funding for stormwater utility improvements for the Town of Daleville.

ES 1. Project Planning

The wastewater utility planning area includes all customers currently serviced by the Delaware County Regional Wastewater District (DCRWD) who's flow is treated by the Town of Chesterfield (Chesterfield). This includes all customers within the Town of Daleville corporate limits in Delaware County, the Laurelwood and Royal Oaks neighborhoods in Madison County, and the interceptor from Daleville to the Chesterfield. Flows cross from Delaware County into Madison County and discharge into Chesterfield's system. The wastewater planning area includes approximately 1,337 acres of primarily residential and some commercial properties within both Delaware and Madison Counties.

The planning area for the storm water utility is the Daleville corporate limits. The corporate limits encompass approximately 1,314 acres, with the majority of the area consisting of residential properties and a smaller portion of commercial properties.

A projected design population increase of approximately 0.3% annually was utilized for to project demand within the planning area. This was the average State of Indiana growth rate in 2016 (obtained from an article by IU Kelley School of Business). Modest growth is merited when planning, and given the county's negative growth trends, the state average seems suitable.

ES 2. Existing Facilities

A. Wastewater Facilities

These are not being considered for the SRF Daleville's wastewater collection system is currently owned and operated by the DCRWD. DCRWD and Daleville are, however, making arrangements for Daleville to assume ownership. The system consists of gravity sewer, manholes, five (5) lift stations, and force mains. As noted above, wastewater flow is conveyed to Chesterfield for treatment.

The wastewater collection system consists of approximately 70,000-feet of gravity sewer. The gravity sewer diameter ranges from 8-inch to 12-inch in diameter and includes approximately 214 manholes.

Two (2) previous sewer system assessments have been completed over the last ten (10) years on portions of the wastewater collection system. The result of those assessments are the gravity sewers, manholes, lift stations, flow meter, and SCADA system all have noted deficiencies.

Residential users pay $47 per month and commercial users pay $85 per month. The Delaware County Redevelopment Commission also provides payment to DCRWD on behalf of Daleville to cover the cost of debt service which is owed by the Daleville sewer service area to Chesterfield. This payment subsidizes the sewer rates, keeping them at current noted levels.

B. Storm Water Facilities

Daleville owns and operates the storm water collection system within its corporate limits. The notable exceptions are the culvert pipes which cross under the Indiana Department of Transportation (INDOT) highways and the railroad. Those are controlled by INDOT and the railroad, respectively. Stormwater in Town is collected by catch basins, inlets, and storm sewers, ultimately discharging into the White River.

Daleville's storm water collection system consists of 10-inch to 84-inch diameter pipe. Additional pipes which directly impact Daleville's collection system but are not owned by Daleville include culvert pipes under the railroad, SR 32, and SR 67. There are two (2) 60-inch culverts located under the railroad tracks and SR 32 immediately west of town hall which convey surface water through an unnamed tributary of the White River. There are twin box culverts under SR 67 at CR 800 W which also convey surface water north eventually to the White River. There are two (2) additional culverts under SR 32 at various locations and another box culvert under SR 67 between Dale Harter Drive and Innovation Drive. This conveys flow from the south side of SR 67 into the 84-inch storm sewer which eventually discharges to the unnamed tributary west of town hall.

Each customer currently pays a storm water utility fee of $1.50 per month.

ES 3. Future Situation

A. Wastewater Utility

The Town does not anticipate being able to take over the wastewater utility in the near future. Therefore, no further consideration is given to the wastewater utility for the purposes of this SRF PER.

B. Storm Water Utility

The Town has reported that the existing infrastructure for storm water is not efficiently draining storm water. A watershed analysis was performed utilizing the rational method for runoff flows as part of this master plan assembly. It was determined that within Daleville fourteen (14) different drainage basins the majority of Daleville's existing storm water infrastructure cannot adequately convey a 10-year, 1-hour storm (the basis of standard design practice). Further, the master plan identified areas throughout Town with no storm water infrastructure; which is required to eliminate standing water.

ES 4. Proposed Project

A. Storm Water Proposed Project

1. Proposed Project

The proposed project was selected based upon a cost-effective analysis and consideration of non-monetary impacts, listed in **Table ES-1**.

Table ES-1
Proposed Projects

Ponding Area and I/I Improvements
• Construct a new storm pipes with catch basins and bioswales Baseball field
• Construct a new storm pipe with bioswales/hybrid ditches from Tennessee Street to River Road across SR 32
• Construct new 12-inch storm pipe with catch basins along West 6th Street • Construct new 12-inch storm pipe with catch basins along South Elbert Street • Construct new 12-, 15- and 18-inch storm pipe along north ends of Maple and Hickory, along John Street, and on to Wayne Street • Construct new 12-inch storm pipe with catch basins along Hickory Lane

2. Total Project Cost

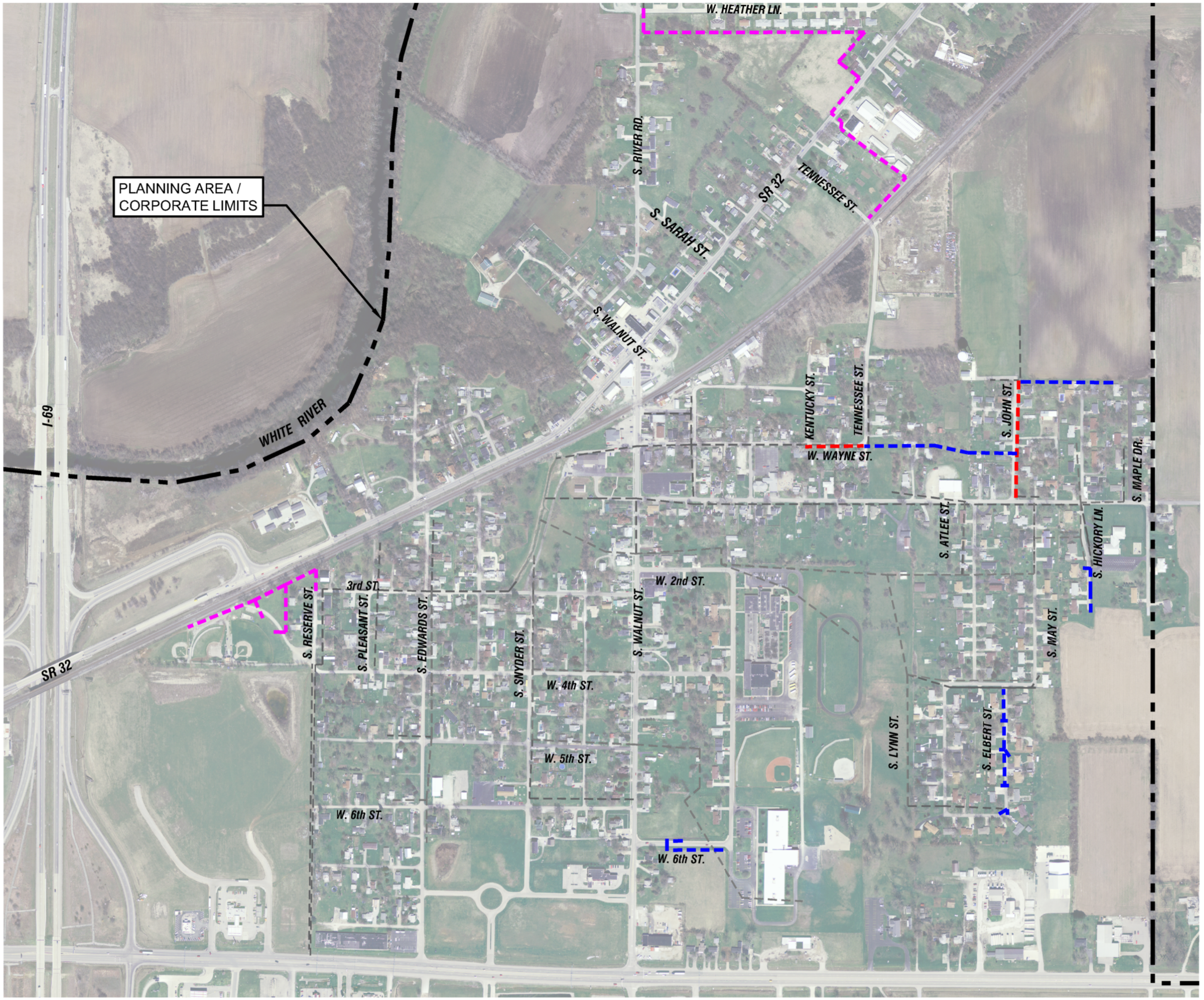
The recommended wastewater project estimated cost is presented in **Table ES-2**. This preliminary estimate includes cost for construction, a 10% construction contingency, and the estimated non-construction costs.

It is of note-worth that the recommended project far exceeds the funds available under the current rate structure. For that reason, project phasing will be discussed as a means to accomplish intent but maintain budget.

Table ES-2
Estimate of Probable Project Construction Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$45,000
Erosion Control	$27,000
Traffic Control	$9,000
Baseball Fields and SR 32 Project	$534,000
West 6th St. Storm Project	$6,000
Elbert Street Storm Project	$174,000
John Street Storm Project	$258,000
Hickory Street Storm Project	$38,400
Subtotal	**$1,091,400**
Contingency (10%)	$109,200
Total Construction Costs	**$1,200,600**
Estimated Non-Construction Costs	
Non-Construction Costs	$310,200
Total Non-Construction Costs	**$310,200**
Total Capital Costs	**$1,510,800**

Figure ES-1 shows the entire recommended project for the storm water utility.



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER RECOMMENDED PROJECT
FIGURE ES-1

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 1:30 PM BY: Jeremy Schmitt

3. Project Phasing

Due to the size of the proposed storm water system improvements in the recommended project and the lack of funds available from the existing rate, the components have been prioritized so Daleville can consider phasing. Each project is prioritized as high, medium, or low priority. High priority projects should be addressed first. Medium priority projects should be addressed after all high priority projects are completed. Low priority projects should be addressed after all medium priority projects are completed. High and medium priority projects address noted flooding areas first. Low priority projects typically address only pipe capacity deficiencies. Projects and their priorities are shown in **Table ES-3** below.

Table ES-3
Project Phasing

Project	Priority	Construction Cost	Non-Construction Cost	Total Capital Costs	Cumulative Capital Costs
Storm Pipe and Catch Basin near SR 32 and the Baseball Fields	High	$635,500	$164,200	$799,700	$799,700
West 6th St. Storm Project	High	$7,200	$1,900	$9,100	$808,800
Total High Priority Costs		**$642,700**	**$166,100**	**$808,800**	
Elbert Street Storm Project	Medium	$207,100	$53,500	$260,600	$1,069,400
John Street Storm Project	Medium	$305,000	$78,700	$383,700	$1,453,100
Hickory Street Storm Project	Medium	$45,800	$11,900	$57,700	$1,510,800
Total Medium Priority Costs		**$557,900**	**$144,100**	**$702,000**	
Total Costs		**$1,200,600**	**$310,200**	**$1,510,800**	**$1,510,800**

4. Project Schedule

The project schedule for performing all of the recommended alternative is shown below in **Table ES-4.** The project schedule shows the timeline starting with the completion and approval of this master plan.

Table ES-4
Storm Water Proposed Project Schedule

Completion of PER	June 2019
Town Authorizes Preparation of ER	August 2019
Completion of ER	November 2019
Town Files for Funding	November 2019
Town Receives Funding Agency Approval	February 2020
Town Authorizes Design	November 2019
Completion of Final Design	June 2019
Application and Receipt of Permits	August 2020
Submission to Funding Agency for Permission to Bid	September 2020
Town Advertises for Construction Bids	December 2020
Town Receives Construction Bids	February 2021
Town Authorizes Construction	March 2021
Town Substantially Completes Construction	February 2022
RUS Conducts Final Inspection	January 2022

Section 1 – Project Planning

The purpose of this Preliminary Engineering Report (PER) is to present an engineering evaluation of the Town of Daleville (Daleville) existing wastewater and stormwater system. In general, this PER presents the following:

- **Project Location** – Identifies the project limits and the existing and future 20-year service areas.
- **Current Situation** – Describes the current wastewater system, including the condition of existing facilities and performance issues.
- **Future Situation** – Establishes current and future population, flows and loadings.
- **Evaluation of Alternatives** – Identifies feasible solutions to address current and future issues facing the wastewater system and evaluates each solution with regard to costs, technical considerations, reliability, ability to implement and environmental impacts.
- **Evaluation of Environmental Impacts** – Evaluates direct and indirect environmental impacts of the recommended alternatives.
- **Selected Plan** – Describes the proposed project to address current and future issues associated with the wastewater system. Includes project costs and implementation scheduling.
- **Legal, Financial, and Managerial Capabilities**
- **Public Participation**

Section 1 defines the project planning area and planning period. This section also provides background information and current characteristics of the planning area. This information is utilized for the engineering analyses and decision-making processes within this report.

1.1 Location

The Town of Daleville is located in Delaware County, Indiana. Daleville is located 40 miles northeast of Indianapolis, east of I-69 and mostly north of SR-67 along the White River **(See Figure 1-1).**

The wastewater and storm water utilities planning areas differ. The wastewater utility planning area includes all customers currently serviced within and immediately adjacent to Daleville (the old Delaware County Regional Wastewater District sewer component for Daleville) including the main interceptor from Daleville to the Town of Chesterfield. The wastewater planning area includes approximately 1,337 acres of primarily residential and some commercial properties within both Delaware and Madison Counties **(See USGS Quadrangle Map Figure 1-2A)**.

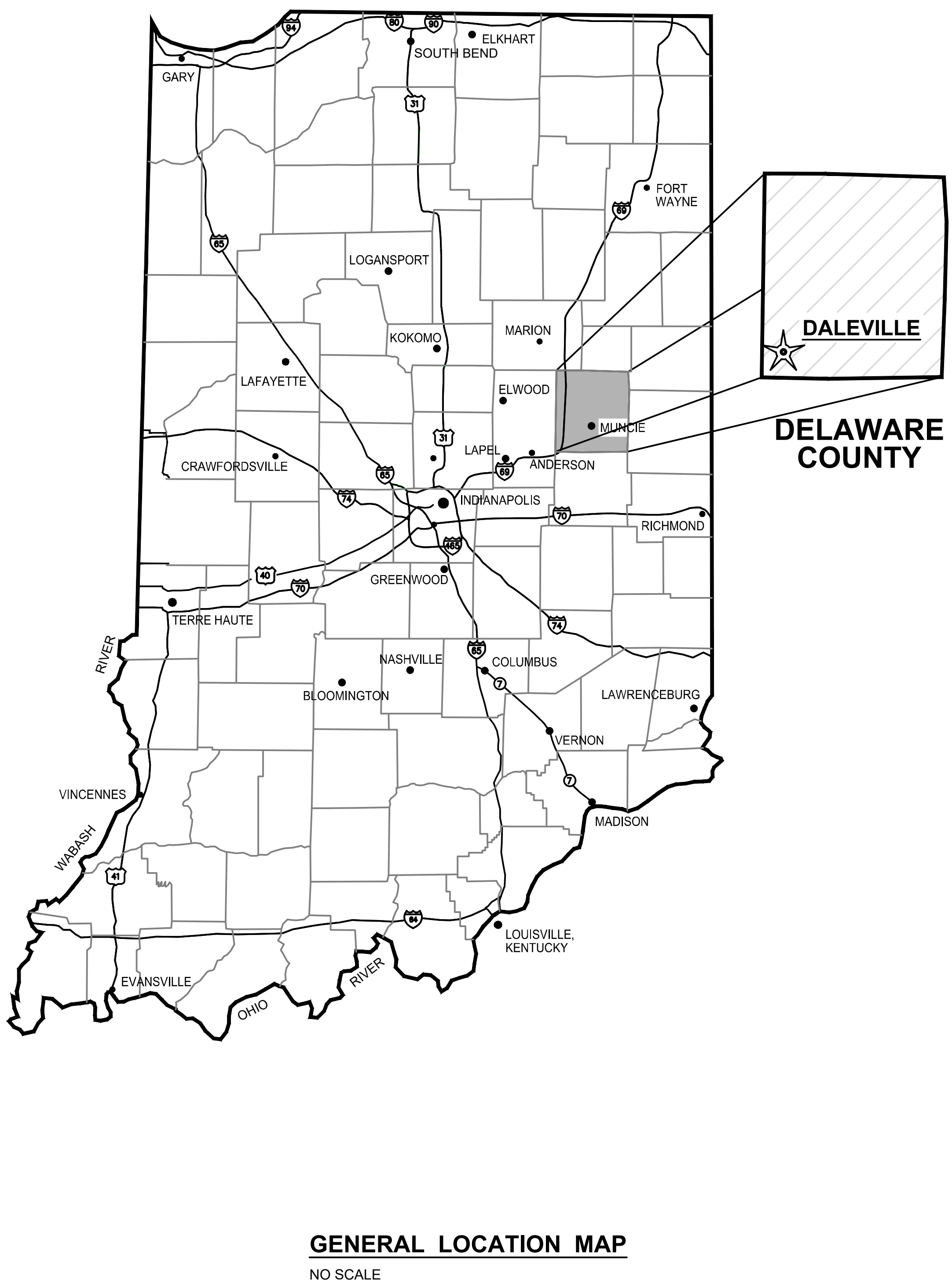
The planning area for the storm water utility is the Daleville corporate limits **(See Figure 1-2B).** The corporate limits encompass approximately 1,314 acres, with the majority of the area consisting of residential properties and a smaller portion of commercial properties. The project location information is detailed in the following **Table 1-1**.

Table 1-1
Project Location

County	U.S.G.S. Quadrangle Map	Township	Range	Section
Delaware	Muncie	19 N	9 E	6
Madison	Muncie	19 N	8 E	1

For the remainder of this report, with regards to the environmental resources analysis, the wastewater planning area will be used as the overall planning area. This will be done because the storm water planning area falls completely within the wastewater planning area.

In addition to the planning areas shown in **Figures 1-2A** and **Figures 1-2B,** Daleville has identified potential future areas of development and annexation. **Figure 1-2C** shows this “Future Planning Areas” along with potential future land uses of the area. Although this area has been identified its potential future inclusion does not impact the infrastructure improvement recommendations within this report.



GENERAL LOCATION MAP

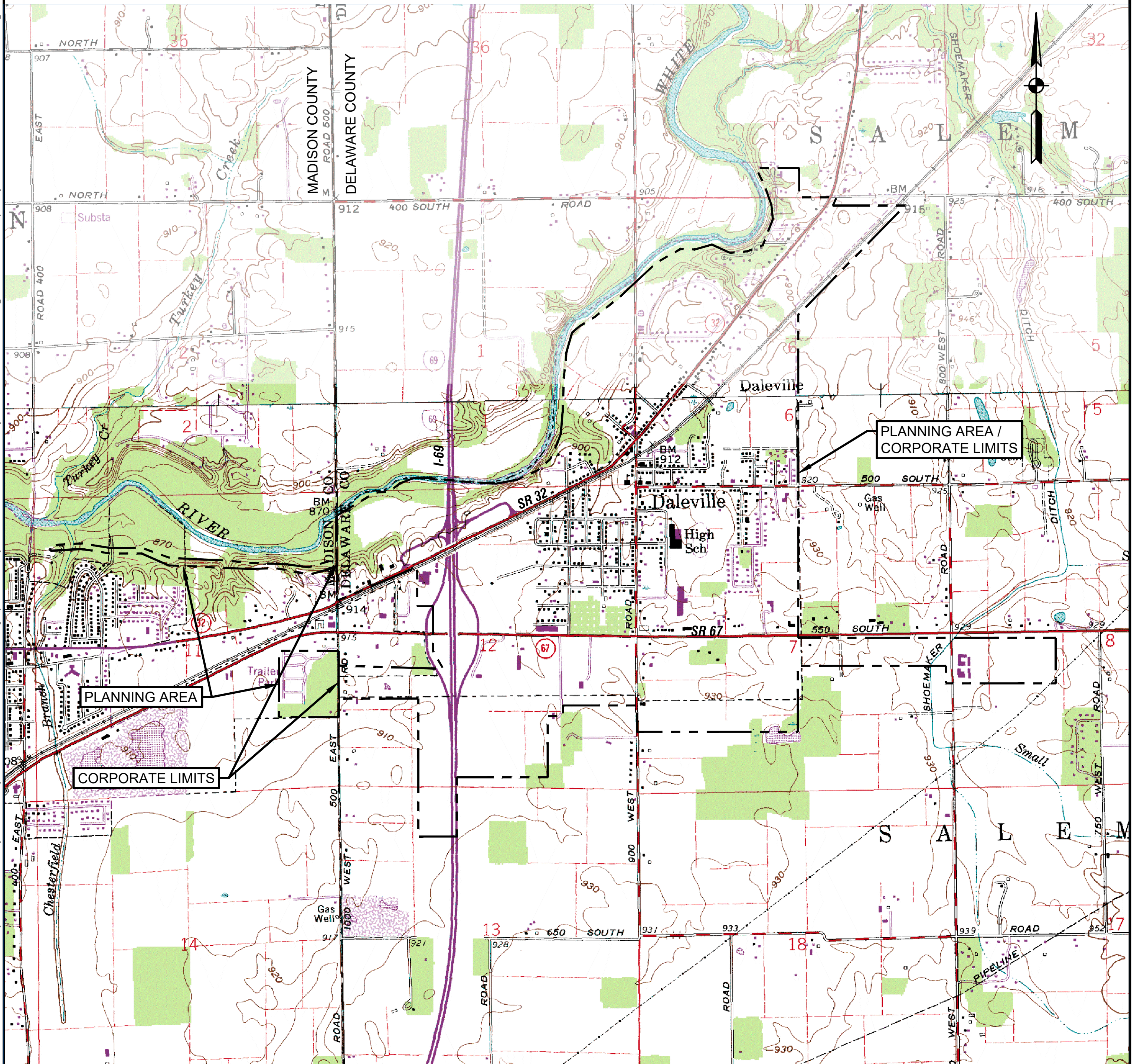
NO SCALE

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA DELAWARE COUNTY	
WASTEWATER AND STORMWATER UTILITY MASTER PLAN	
GENERAL LOCATION MAP FIGURE 1-1	

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg 6/14/2019 9:03 AM

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:03 AM BY: George Rader



SCALE: 1"=2,500'

2,500' 0 2,500'

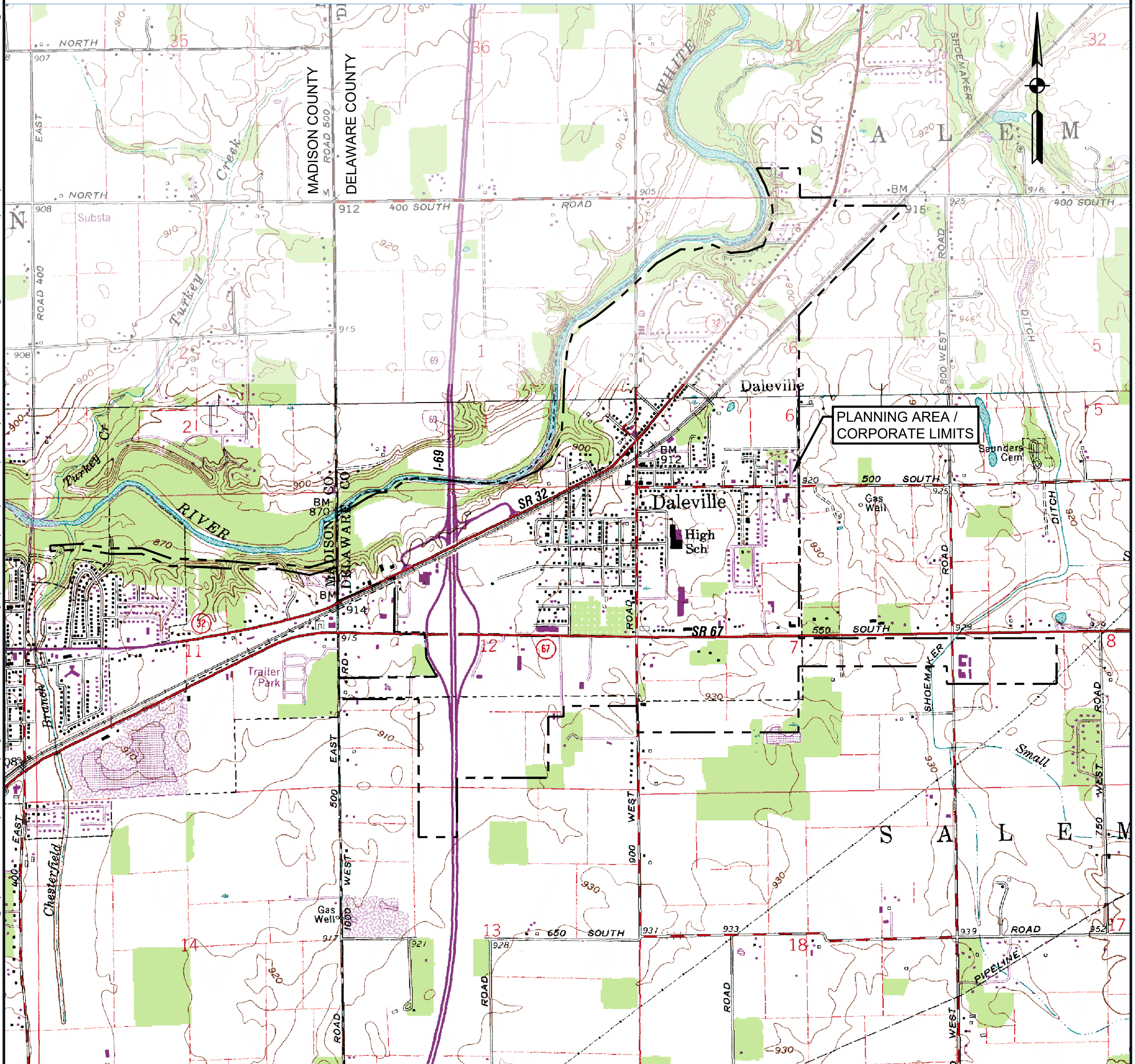
COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER PLANNING AREA
FIGURE 1-2A

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:03 AM BY: George Rader



SCALE: 1"=2,500'

2,500' 0 2,500'

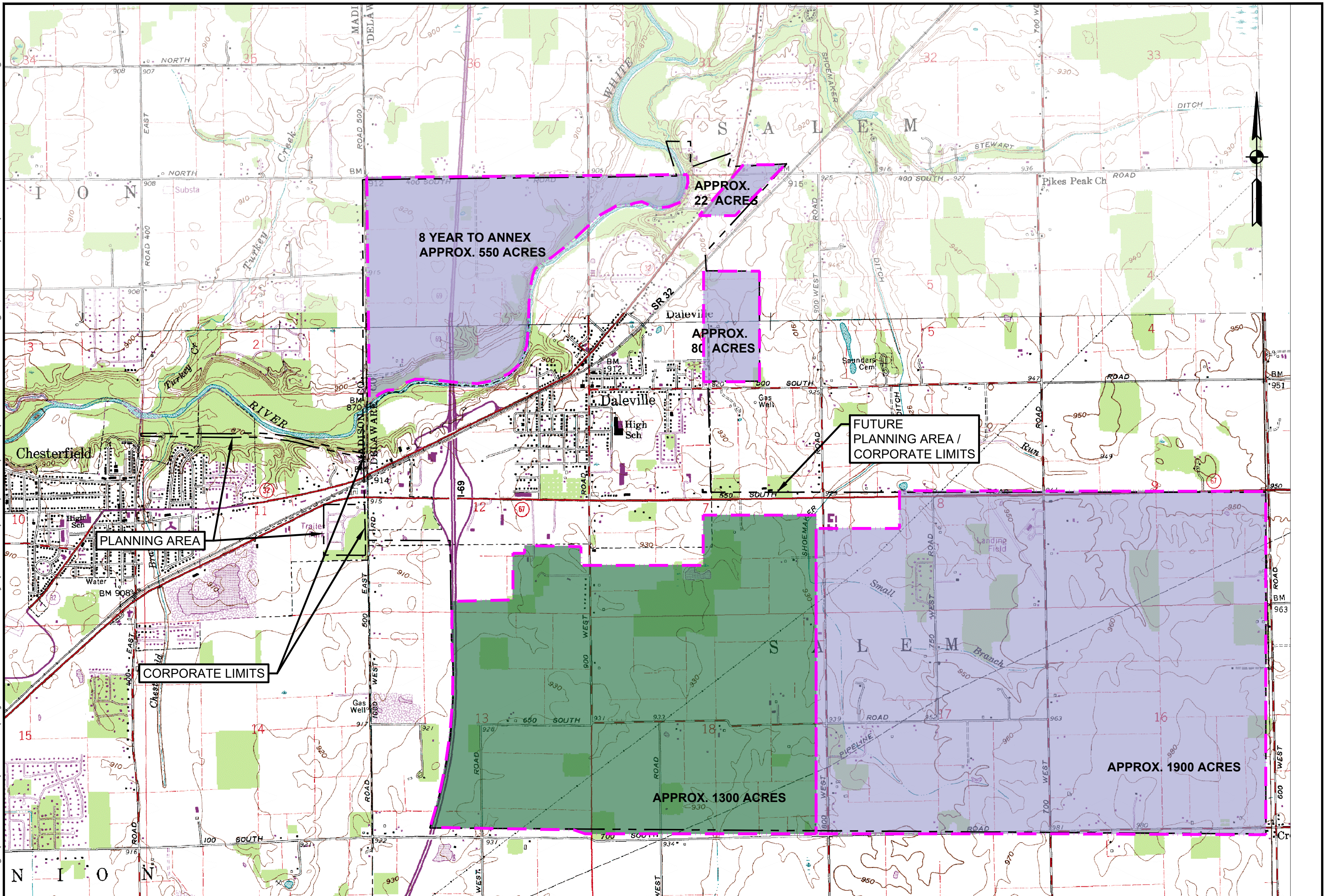
COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORMWATER PLANNING AREA
FIGURE 1-2B

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:03 AM BY: George Rader



FUTURE RESIDENTIAL

FUTURE COMMERCIAL

FUTURE PLANNING AREA BOUNDRY

SCALE: 1"=3000'

3000' 0 3000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

FUTURE PLANNING AREA
FIGURE 1-2C

1.2 Growth Areas and Population Trends

A. Population Trends

The United States Census Bureau counts and tabulates population every 10 years. Locally, data is available for Delaware County and the Town of Daleville. **Table 1-2** shows the data from the year 1900 to the year 2010. This population growth trend is valuable for estimating the future population projection. Information for the Town of Daleville is only available for the last 30 years.

Table 1-2
Historical Population by Census Count

Year	Delaware County Population	Town of Daleville Population
1900	49,624	N/A
1910	51,414	N/A
1920	56,377	N/A
1930	67,270	N/A
1940	74,963	N/A
1950	90,252	N/A
1960	110,938	N/A
1970	129,219	N/A
1980	128,587	N/A
1990	119,659	1,681
2000	118,769	1,658
2010	117,671	1,647
2015	116,019	1,607

Source: STATS Indiana Online

Table 1-2 generally shows that the Delaware County population has been consistently decreasing for the last 40 years. The population projection for Delaware County by the Indiana Business Research Center (obtained from the STATS Indiana website) estimates this decline to continue for the next 40 years, as depicted in **Table 1-3**. The historical population for Daleville only provides data for the last 30 years and appears to be declining. Since no projection was separately developed for Daleville by STATS Indiana, we have projected the Town's growth to match that of Delaware County. The projected population of Daleville, based on the county projection, is presented in **Table 1-3**. The table presents a third column which projects a population for Daleville should the Town experience the expected population increase across the state. The projected population increase across the state is approximately 0.3% and was the Indiana growth rate in 2016 (obtained from an article by IU Kelley School of Business). **Figure 1-3** shows a graph with Delaware County's historical and projected populations, Daleville's historical population, and Daleville's negative and positive projected populations.

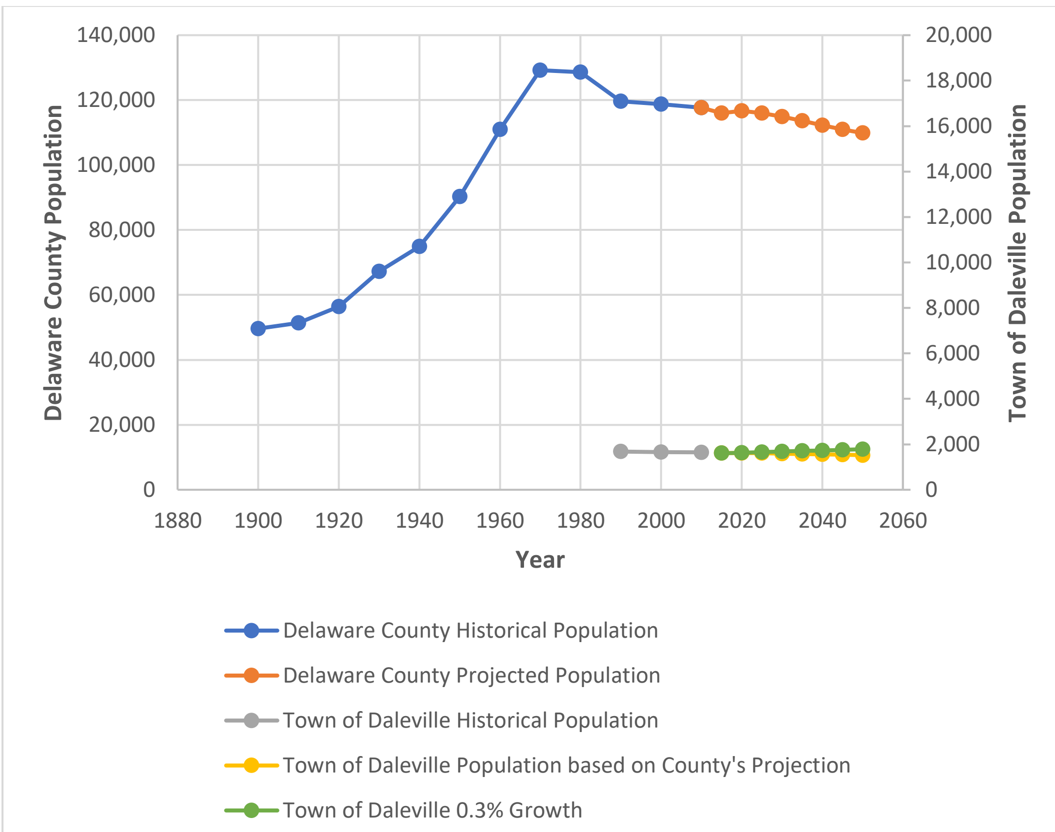
Table 1-3
Population Projection

Year	Delaware County Population Projection	Daleville Population Projection based on County's Projection	Daleville Population Projection based on Estimated Planned Growth
2020	116,719	1,616	1,631
2025	116,018	1,607	1,656
2030	114,951	1,592	1,681
2035	113,633	1,574	1,706
2040	112,287	1,555	1,732

Source: STATS Indiana Online

Figure 1-3

Projected Population



It is not prudent to base planning upon a negative growth projection. Therefore, the 0.3% growth projection representative is state-wide growth will be utilized.

It is worth noting, if the Town begins to experience growth from the future planning areas, full build-out is anticipated to equate to a population increase of 3,369 (approximately a tripling of the current population). This population increase assumes that all 2,552 acres of residential land would develop at Daleville's average density of 0.55 houses per acre and at the Indiana average of 2.4 persons per household.

B. Local Economy

The local economy is an important demographic factor that must be considered when planning for any utility project. Since funding of projects is based on need, it is important to know the economic nature of the community. STATS Indiana maintains a database of demographic information for cities, towns, townships, and counties located in Indiana.

1. Area Employment

The latest data available for employment and average wage data for Delaware County is from the year 2015. Data for employment and average wage was not available for Daleville. The data is shown in **Table 1-4**.

Table 1-4
Delaware County 2015 Employment and Wage Data

	Establishments	Jobs	Average Yearly Wage
Total Employment	**2,192**	**45,113**	**$37,416**
Agriculture, Forestry, Fishing, Hunt	19	0	0
Mining	3	0	0
Utilities	8	155	$80,077
Construction	172	1,427	$44,401
Manufacturing	126	4,321	$48,855
Wholesale Trade	107	937	$51,999
Retail Trade	404	6,419	$24,222
Transport. and Warehousing	57	1,350	$44,932
Information	17	385	$40,544
Finance and Insurance	148	1,715	$42,741
Real Estate, Rental, Leasing	103	655	$36,500
Professional and Tech. Services.	164	1,769	$44,644
Mgmt. of Companies	19	920	$86,136
Admin. and Waste Services	106	2,361	$24,362
Educational Services	49	2,317	$33,230
Health Care and Social Assistance	238	7,950	$43,816
Arts, Entertainment and Recreation	43	485	$13,560
Accommodation and Food Service	204	4,633	$13,295
Other Services	170	1,117	$25,075
Public Administration	38	1,437	$38,100

The unemployment rate in 2015, for Daleville, was estimated to be 11.6%, which is higher than the state average of 4.8%. Currently, Delaware County ranks 17th for highest unemployment rate out of the 92 counties in the State.

2. Area Income

The most recent income data available from STATS Indiana is year 2015. As of that year, Delaware County had a poverty rate of 23%, while Daleville presents a poverty rate of 10.9%, which is lower than the county's average.

According to the American Community Survey (ACS, 2010) the average median household income for the Town of Daleville is $47,500.

Section 2 – Existing Facilities

2.1 Location Map

Daleville's wastewater collection system is currently owned and operated by the Delaware County Regional Wastewater District (DCRWD). The system consists of pump stations, force mains, and gravity sewer lines. The wastewater flow is conveyed to the nearby Town of Chesterfield for treatment. **Figure 2-1** presents the existing sanitary sewer system. In **Appendix B** a large map of this wastewater system shows more detail.

Storm water in Town is collected by catch basins, inlets, and storm sewers and ultimately discharges into the White River. **Figure 2-2** present the existing storm water collection system. The Town of Daleville owns and operates the storm water collection system, with the notable exception of culvert pipes which cross under INDOT highways and the railroad. In **Appendix C** a large map of the storm water system is shown.

2.2 Wastewater Collection System

A. History

The DCRWD was formed in 1976 with the purpose of providing wastewater collection and treatment service to the residents of Delaware County. The DCRWD currently serves approximately 3,600 customers in five areas within the county, including: Royerton, DeSoto, Tanglewood, Westbrook, and Daleville.

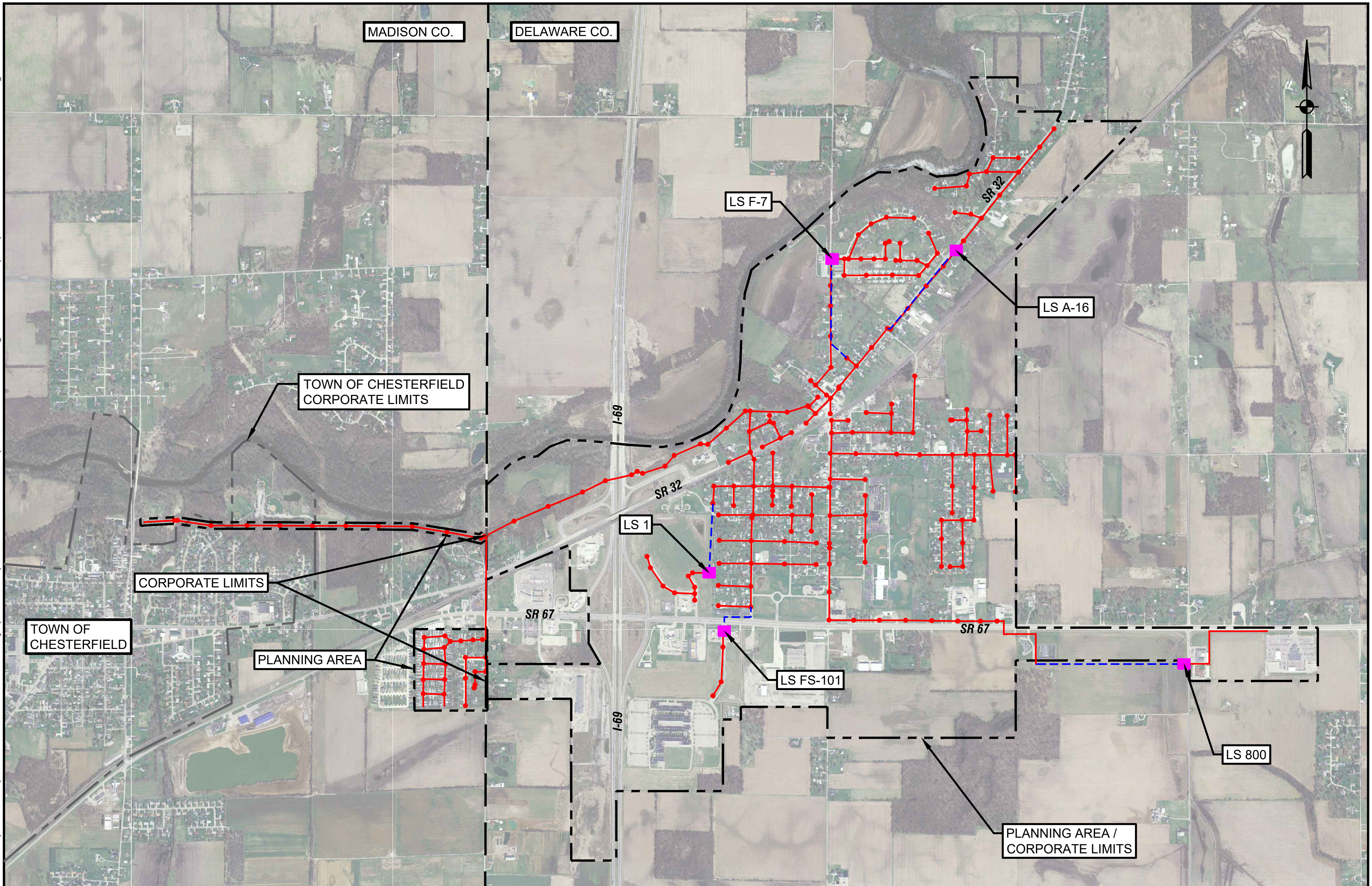
The Town of Daleville's collection facilities are in an isolated service area that do not connect to other systems within the DCRWD. Daleville is, however, connected to the wastewater treatment plant in the Town of Chesterfield (Chesterfield). The treatment agreement between DCRWD and Chesterfield is contained within **Appendix D.**

The first collection system project in the Daleville system was performed in 1978 by Reid, Quebe, Allison, Wilcox & Associates Inc. The project spanned as far south as State Road 67 to parts of Main Street and River Road on the north side of the railroad tracks. This project also expanded from South Reserve Street to as far east as South Asbury lane. This project added approximately 57,000 linear feet of sanitary sewers to the Daleville collection system.

Additional sanitary sewers were added to Daleville's collection system as part of Raintree Estates. This expansion added a total of 10 new manholes and 1,713 feet of 8-inch PVC piping.

A third expansion project, the Dale-Harker Center, was performed in 1996. This project added eight (8) sanitary manholes and one (1) lift station, LS-1. This project also added approximately 1,750 feet of 8-inch PVC gravity sewer piping, along with approximately 1,140 feet of 4-inch PVC force main.

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader



LEGEND

- CORPORATE LIMITS
- WASTEWATER PLANNING AREA
- FORCE MAIN
- MANHOLE
- LIFT STATION
- SANITARY SEWER

SCALE: 1"=2000'

2000' 0 2000'

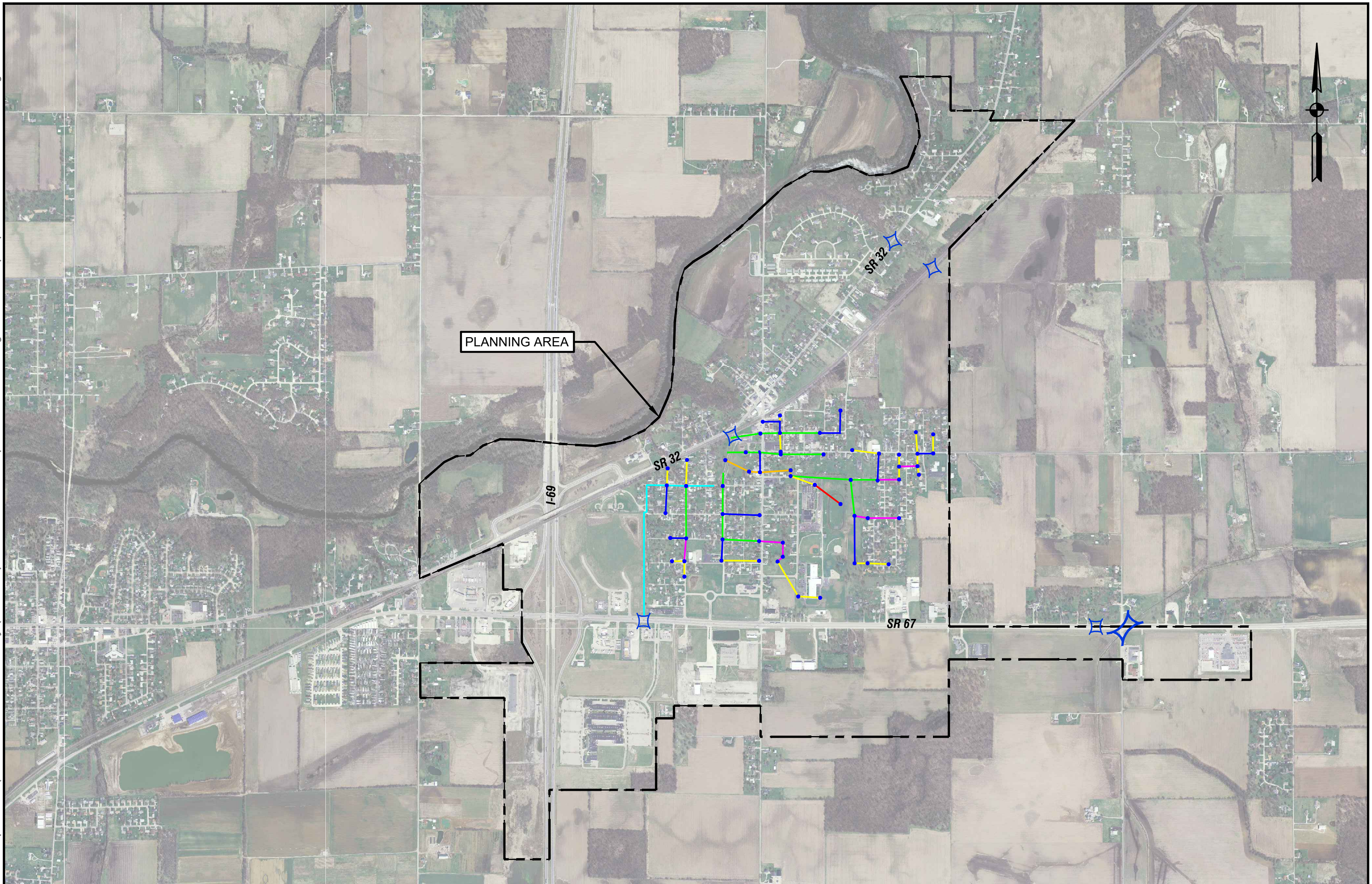
COMMONWEALTH™ ENGINEERS, INC.

A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

EXISTING SANITARY SEWER COLLECTION SYSTEM
FIGURE 2-1



LEGEND

CORPORATE LIMITS / STORMWATER PLANNING AREA	EXISTING CATCH BASIN/MANHOLE
EXISTING 84" STORM PIPE	EXISTING CULVERT
EXISTING 36" STORM PIPE	EXISTING 15" STORM PIPE
EXISTING 24" STORM PIPE	EXISTING 12" STORM PIPE
EXISTING 18" STORM PIPE	EXISTING 10" STORM PIPE

SCALE: 1"=2000'

2000' 0 2000'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER SEWER COLLECTION SYSTEM
FIGURE 2-2

Recently, DCRWD and Daleville have been in negotiations with the purpose of deeding all relevant collection system infrastructure to Daleville. For purposes of this report, the “system” includes all gravity sewers, force mains, and pump stations located within town limits and servicing peripheral customers along with the interceptor that conveys flow from Daleville to Chesterfield.

B. Conditions of Existing Facilities

1. Wastewater Collection System

The wastewater collection system consists of approximately 69,469 feet of gravity sewer. The gravity sewer diameter ranges from 8-inch to 12-inch in diameter and includes approximately 214 manholes. A collection system inventory is presented in **Table 2-1.** Also shown in the table is an estimate of the new construction cost were the assets to be built today and a straight-line depreciated value of the assets for 2018 valuation. The depreciated valuation is the value the asset has depreciated over time and not the estimate value of that system. Each asset depreciation value is based on the year it was installed.

Two assessment projects have been performed over the last decade to evaluate the existing collection system’s condition. In 2008, smoke testing was conducted by Vic Power’s Inc. In 2013, a sanitary sewer assessment was performed by Commonwealth Engineers, Inc.

The 2008 smoke testing project identified over 130 locations as sources of I&I (infiltration and inflow). These locations include castings around manholes, cleanouts, underneath trailers, drains, and houses/buildings. **Table 2-2** summarizes the smoke testing endeavor.

The 2013 sanitary sewer collection system assessment noted additional I&I sources including missing clean out caps, sewer service lateral installation issues, root intrusion, and leaky wall joints in manholes.

Table 2-1
Wastewater Collection System Inventory

Item Description	Unit	Quantity (ft.)	Total Estimate Value (New Construction)	Depreciated Value (2018)
8" Diameter Gravity Sanitary Sewer	L.F.	59,064	$5,318,713	$3,475,248
10" Diameter Gravity Sanitary Sewer	L.F.	4,395	$443,895	$290,041
12" Diameter Gravity Sanitary Sewer	L.F.	5,599	$357,944	$233,882
6" and 8" Siphon Piping in 36" Bored Casing Beneath I-69	L.F.	411	$164,400	$107,418
Total Gravity Sewer:	L.F.	**69,469**		
4" Sanitary Force Main	L.F.	7,200	$360,000	$235,224
Sanitary Lift Stations	EA.	5	$782,000	$336,260
Sanitary Manholes	EA.	214	$796,294	$358,266
Total			**$8,223,246**	**$5,036,339**

Table 2-2
Smoke Testing Summary

Issue	Quantity
Cleanout Cap Defective	26
Cleanout Cap Missing	12
Smoke from Sewer Service Lateral	5
Smoke in Building	8
Smoke from Manhole	17
Smoke from Downspout	2
Smoke from Other	16

2. Lift Stations

The existing wastewater collection system has a total of five (5) lift stations. Each lift station pumps through a 4-inch force main. **Table 2-3** provides the number of pumps, capacity, horsepower and the year of installation. **Table 2-4** shows results from the 2013 assessment mentioned earlier.

Table 2-3
Existing Lift Station Description

Lift Station Location and Name	Number of pumps	Capacity (GPM)	Motor (HP)	Year Installed
River Road (LS F-7)	2	60	5	2004
SR 32 (LS A-16)	2	60	5	2005
CR 800 W (LS 800)	2	60	5	2007
Hartland Business Center (LS FS-101)	2	60	5	2005
Dale Harter Drive (LS 1)	2	60	5	2005

Table 2-4
2013 Assessment Summary for Existing Lift Stations

Lift Station Location and Name	Types of Pumps	Electrical Schematics	Odor Complaints	Evidence of Surcharging
River Road (LS F-7)	Flygt or Weil	Yes	No	No
SR 32 (LS A-16)	Unknown	Yes	No	No
CR 800 W (LS 800)	Not inspected			
Hartland Business Center (LS FS-101)	Flygt or Weil	Yes	No	No
Dale Harter Drive (LS 1)	Flygt or Weil	Yes	No	No

In addition to the results shown in **Table 2-4**, the 2013 assessment noted miscellaneous items needing repair. However, it was also stated that all deficiencies that were identified were within the realm of general maintenance.

Discussions with Daleville indicate DCRWD has been performing repairs to the lift stations. However, the extents of the repairs are unknown, and no information was provided by DCRWD when requested.

One item of concern relates to LS A-16. The high-water alarm has been reported to be actuated during rain events. This is indicative of a lift station requiring additional capacity and/or a service area with excessive I&I.

3. Flow meter

The wastewater from Daleville sent to Chesterfield for treatment is tracked with one (1) Daleville flow meter and one (1) Chesterfield flow meter. The Chesterfield flow meter, however, is located at the WWTP and therefore serves only as a gross check of the accuracy of the Daleville flow meter (by knowing historical percentage flow splits between the two (2) communities).

The Daleville flow meter is an area-velocity flow meter. During the assembly of this PER, it was noted that the Daleville flow meter was inoperable and undergoing repairs. Over this period of time, Chesterfield has assumed a historical percentage of attributable to Daleville for billing purposes. As a result, recent flow metering data indicative of Daleville flow is unavailable. However, at the conclusion of this report assembly it was also noted that said Daleville meter was repaired and is now operational.

Of note-worth, the Daleville flow meter has been moved further downstream since the 2013 assessment. This altered installation location still provides Daleville flow but was thought to be more conducive to longer service life. Unfortunately, the meter continues to malfunction rendering Daleville specific flows elusive.

4. Electrical Systems

From the 2013 assessment, it was noted that all lift stations are remotely monitored. The lift stations are monitored by an independent service; Esco Communications. This service contacts DCRWD staff when there is a problem so they can address the issue. The 2013 assessment further identified that the electrical systems at each lift station do not meet the Class 1, Division 1 requirements. This is not unusual for installations of this vintage as the Class 1, Divisions 1 “explosion proof” requirement only came into effect as best design practice in recent years.

The 2013 assessment also noted the lift stations are devoid of backup power (no emergency generators on site). However, the assessment did not indicate if the lift stations having provisions for being run using a portable generator.

C. Financial Status of Existing Utilities

It is important that user fees and charges be examined frequently, to ensure that they can recover all direct and indirect costs of service. Rate structures should be reviewed with the Town's rate consultant and financial advisor, and rate modifications should be formally approved by the Town Council. Any unfavorable balances in cost recovery should be highlighted in the budget documents and addressed promptly. Currently Daleville does not own the sanitary utility. However, since the Town is in the process of acquiring the utility, an accurate accounting of funds necessary to operate, maintenance, and repair/improve is paramount.

For the purpose of this analysis, no outstanding loans or debt on the Daleville System are assumed to exist. However, a local TIFF implemented in 2014 has encompass much of Daleville. This TIFF was subsidizing the cost to pay for part of Chesterfields new wastewater treatment plant. Presented in **Appendix E** is a memorandum that discusses the TIFF.

1. Existing O&M and Customer Base

Table 2-5 presents the value of short-lived assets for the Daleville System.

Table 2-5
Estimated Existing Short-Lived Assets

Existing Short-Lived Assets				
Description	Replacement Cost	Useful Life	Total	Remaining Useful Years
Lift Station F-7 Pumps	$30,000	15	$2,000	2
Lift Station A-16 Pumps	$30,000	15	$2,000	3
Lift Station LS 1 Pumps	$30,000	15	$2,000	3
Lift Station LS 800 Pumps	$30,000	15	$2,000	5
Lift Station FS-101 Pumps	$30,000	15	$2,000	3
Flow Meter	$12,000	10	$1,200	0
Total Existing Short-Lived Assets			**$11,200**	

Because Daleville does not currently own, maintain, or operate the system, payments are made to DCRWD who in turn compensates Chesterfield for treatment costs and utilizes the remainder for operation, maintenance, repair, improvements and administrative purposes.

Utility customer costs for Daleville are shown in **Table 2-6.** The total number of residential and commercial wastewater utility customers is 696. Of the 696 customers, 654 are residential and 42 are classified as commercial. There are currently no customers classified as industrial.

The equivalent dwelling units (EDUs) are shown in **Table 2-7.** These are determined by dividing 310 GPD into the average daily flow. One EDU is equal to 310 GPD.

Table 2-6
Estimated Existing
Monthly Operation and Maintenance Costs

Residential O&M Cost per Connection	
Description	Costs/Connections
Treatment Plant Cost (Paid to Chesterfield)	$27.13
Maintenance Labor (Paid to DCRWD)	$19.87
Residential Total	$47.00
Connections	654
Total Residential Monthly O&M	$30,738
Commercial O&M Cost Per Connection	
Description	Costs/Connections
Treatment Plant and Maintenance	$85.00
Commercial O&M Total	$85.00
Connections	42
Total Commercial Monthly O&M	$3,570
Total Monthly O&M	**$34,308**

Table 2-7
Equivalent Dwelling Unit Calculations

Average Flow from Daleville (GPD)	Average Flow (GPD) PER EDU	EDUs
237,722*	310	767

*The average flow from Daleville was provided by the wastewater treatment plant operator in Chesterfield. The data collected is from 2016 and 2017, when the meter was not broken. The flow is the average monthly flow. The monthly flow is calculated based on the total flow from the entire month and dividing by the total days in that month.

2.3 Storm Water

A. History

Expansions to Daleville's storm water system occurred in 1993, 1996, and 2014. As a part of these projects, new storm sewer pipes were added to the infrastructure.

The project in 1993 consisted of adding storm sewers from 7th Street to Washington Street. This project also went as far west as Reserve Street to Maple Drive.

The project in 1996 added 21 storm manholes along with 76 feet of 15-inch RCP pipe, 324 feet of 18-inch RCP pipe, 663 feet of 21-inch RCP pipe, 140 feet of 24-inch RCP pipe, 561 feet of 30-inch RCP pipe, 492 feet of 36-inch RCP pipe and 820 feet of 42-inch RCP pipe.

Commonwealth Engineers, Inc. designed the 2014 Improvements Project. This project was along Daleville Road and added approximately 2,135 feet of additional storm sewer.

The storm water utility was created under Ordinance 03-01 in 2003. Then on July 11, 2005 the utility user fee of $1.50 was created by Ordinance 05-04. This Ordinance is only for the user fee of $1.50 and does not state about future raising of rates.

B. Conditions of Facilities

Daleville's storm water collection system consists of 10-inch to 84-inch diameter pipe within the planning area. Additional pipes which directly impact Daleville's collection system but are not owned by Daleville include culvert pipes under the railroad, SR 32, and SR 67. There are two (2) 60-inch culverts located under the railroad tracks and SR 32. There are twin box culverts under SR 67 at CR 800 W and a pipe crossing under SR 67 between Dale Harter Drive and Innovation Drive. The Town has reported that the existing infrastructure for storm water is not efficiently draining storm water which is creating issues for the stormwater system and wastewater system. The ponding becomes a source of I/I. A number of areas consistently present flooding and ponding during wet weather events. Photos reflective of these flooding areas are contained in **Appendix F.**

Table 2-8 shows the fixed assets for the storm system. This also shows the estimated new construction cost were the assets to be built today and a straight-line depreciated value. The depreciated valuation is the value the asset has depreciated over time and not the estimated value of that system. Each asset depreciation value is based on the year it was installed.

Table 2-8
Storm Water Fixed Assets Inventory

Item Description	Unit	Quantity (ft.)	Total Estimate Value (New Construction)	Depreciated Value (2018)
10" Diameter Storm Pipe	L.F.	472	$28,320	$9,440
12" Diameter Storm Pipe	L.F.	5294	$370,580	$123,527
15" Diameter Storm Pipe	L.F.	3964	$356,760	$118,920
18" Diameter Storm Pipe	L.F.	1566	$156,600	$52,200
21" Diameter Storm Pipe	L.F.	809	$88,990	$29,663
24" Diameter Storm Pipe	L.F.	4970	$546,700	$182,233
30" Diameter Storm Pipe	L.F.	652	$78,240	$26,080
36" Diameter Storm Pipe	L.F.	751	$97,630	$32,543
42" Diameter Storm Pipe	L.F.	820	$114,800	$38,267
84" Diameter Storm Pipe	L.F.	Unknown		
Total Gravity Sewer:	L.F.	**17,017**		
Catch Basins	EA.	62	$105,400	$52,700
Total			**$1,944,020**	**$665,573**

C. Financial Status

The Town of Daleville's monthly storm water utility fee is $1.50 per customer which has been the rate since the utility was created. Commonwealth reviewed storm water utility budget information provided by the Town from 2013 to 2016. At the end of 2016 the Town had $8,363.43 in the storm water account. The storm sewer collection system has no outstanding loans associated with the system. **Table 2-9** shows the O&M costs for Daleville's storm water system. The system also has no short-lived assets associated with its operations. Based on the contents of **Table 2-9**, the storm water utility has operated at a deficit three (3) of the previous four (4) years.; 2013, 2014, & 2015. The annual revenue from previous four years from storm water utility is $11,772.

Table 2-9
Storm Water O&M Costs

Estimated Existing Annual O&M	
Description	Costs/Connections
2016 Billing Costs	$5,810.69
2015 Billing Costs	$12,138.62
2014 Billing Costs	$33,279.22
2013 Billing Costs	$50,075.88
Average Annual O&M	$25,400

1. Customer Base

Based on available data for the year 2014, the total number of storm water utility customers is 696.

Section 3 – Future Situation

The purpose of this section is to identify system needs and deficiencies based on a thorough evaluation of available information as well as specific issues noted by Daleville. Proposed alternatives to target the needs described herein are detailed in a subsequent section of this report.

3.1 Wastewater Utility

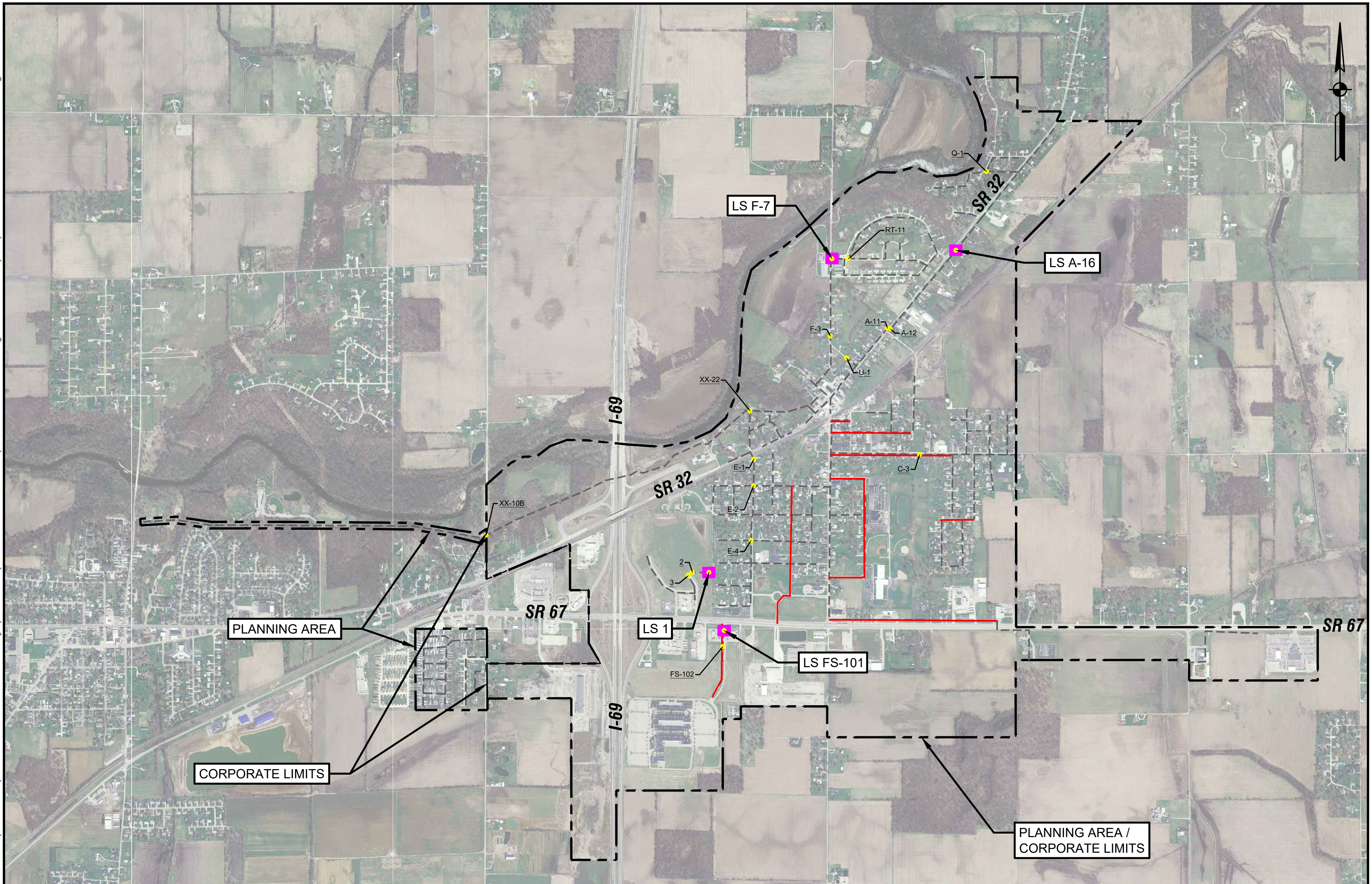
A. Health, Sanitation and Security

As described in **Section 2 – Existing Facilities**, Daleville's collection system is comprised of dedicated

sanitary sewers and lift stations that convey flow to the Chesterfield's Wastewater Treatment Plant (WWTP). When wet weather events occur, influent flow to Daleville's sanitary sewers and lift stations increase substantially due to infiltration and inflow (I&I). I&I describes water that enters the system through both direct and indirect means. Infiltration is the ingress of groundwater into sewers through a defect or porous area in the pipe or manhole wall. Inflow is the direct entrance of storm water into the sanitary system through manhole lids or improper connection of drain lines to the sanitary sewer system. When the increase in flow exceeds the capacity of the sewers or lift stations, sewage back-ups into homes or overflows to the surface can occur. These unauthorized events are referred to as sanitary sewer overflows (SSOs).

Currently, the system does not present evidence of SSOs. However, during a 2-inch rainfall event, the high-water alarms at lift station LS A-16 went off, meaning that the pumps were not keeping up with the influent flow to the wet well. An event with a longer duration or larger intensity could have surcharged the wet well and produced an overflow of sewage. It is imperative to minimize and eliminate known sources of I&I to protect against exposure of sewage to the community and the environment. Sanitary back-ups and overflows present a significant risk to human health and the environment; therefore, the system I&I must be addressed.

Smoke testing was performed in a portion of the collection system in 2008 to identify sources of I&I. The system was further investigated in 2013 as part of the wastewater assessment study; whereby lift stations and representative system manholes were inspected. **Figure 3-1** shows the pipes that were smoke tested in 2008 and the manholes and lift stations inspected in 2013. At the time, over 130 locations of potential I&I sources were identified. Given the time that has passed since this investigatory work and since no record of corrective action has been provided other than pump work at the lift stations, the current state of the wastewater collection system will have only deteriorated further. Improvements to the system's gravity sewers and manholes inclusive of rehabilitation and/or replacement is required to reduce I&I.



LEGEND

Dash-dot line	PLANNING AREA / CORPORATE LIMITS
Dashed line	EXISTING WASTEWATER PIPES
Red line	AREAS THAT WERE SMOKE TESTED
Magenta square	MANHOLES AND LIFT STATIONS ASSESSED DURING 2013 SEWER ASSESSMENT

SCALE: 1"=2000'

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

PAST SMOKE TESTING AND SEWER ASSESSMENT AREAS
FIGURE 3-1

The existing wastewater collection system ordinance likely needs to be reviewed and revised. This ordinance needs to account for regulatory considerations of owning and operating a wastewater utility. Primarily this will include what and how users can discharge to the collection system. However, it also should consider the need for grease traps for restaurants discharging to the collection system. If DCRWD is unable to provide a list of businesses which have grease traps, Daleville will need to determine which businesses maintain grease traps. Next, verification those businesses do have grease traps will be needed. Any which do not have grease traps will need to provide them. Finally, it will be necessary to verify the grease traps are being maintained. This is usually done by an annual inspection to show they have been cleaned.

B. Aging Infrastructure

The two (2) evaluations of the wastewater collection system conducted in 2008 and 2013 present a representative overview of the overall condition of the existing wastewater collection system. Findings are summarized in **Section 2 – Existing Facilities**. The evaluations identified deficiencies that can be attributed to both inconsistent maintenance and aging of the infrastructure.

The lion's share of Daleville's wastewater collection system was constructed 35 to 40 years ago, with some newer areas installed 20 years ago. As the sewer system ages, leaks and cracks in the sewer are more prominent and predominant, representing major sources for infiltration of groundwater into the sewers and manholes, and/or, affording routes for exfiltration of sewage into the surrounding soils and ultimately the aquifers. Infiltration was observed in LS F-7, as a constant flow of clear water was entering the wet well at the time of the 2013 assessment. The high-water alarm at LS A-16 is indicative of significant I&I within the sewer-shed feeding this lift station.

Each lift station in the Daleville system contains two (2) pumps; one (1) pump operates as primary and one (1) as standby. Each lift station has flow conveyed through individual 4-inch force main. The pumps in each lift station were rated at 60 GPM when they were installed, however as the force mains age the pipes can corrode and debris can collect. This means the pumps experience more pressure loss due to friction. As more pressure loss occurs, the flow rate the pumps produce decreases. This means 60 GPM pumps when first installed may decrease over time to 50 GPM or even lower. Even if the pumps are maintaining the original design flow of 60 GPM, the velocity of the wastewater in the force mains is roughly 1.50 feet per second (fps). This is significantly slower than the required velocity of at least 2 fps or above which is needed to prevent the settling of solids. Since the pumps are operating at flows below 2 fps, it is likely the force mains have begun to fill with debris. The assessment also identified some deficient items related to the original pump station construction. A prime example of this is the valve vault for LS FS-101 has no drain.

As manholes age, their components start to break down. Examples of this are broken castings and frames, broken and/or loose casting gaskets, leaking frame seals, root intrusion, and wall joint leaks. These conditions increase ingress of I&I into the system.

The 2008 assessment identified over 130 locations of I&I using smoke testing. However, the smoke testing was only done to part of the system. It is highly probable that many other sewers in the system have the same issues which would be revealed upon additional inspection. Also, 10 years have passed since the testing with no record of repairs on the sewer system having been completed by DCRWD. Therefore, the leaks identified in 2008 will have likely increased creating more I&I; along with the additional leaks created due to passage of time and normal wear and tear.

In addition to I&I concerns, infrastructure is also susceptible to degradation due to corrosion. Corrosion can occur due to the exposure to hydrogen sulfide (gaseous or liquid) and also results due to the generally damp environment within structures. Corrosion processes can lead to leaks, infiltration and even pipe collapse. Corrosion has been seen in the system as described below:

- Corrosion of force main piping in both the wet well and the valve vault in all lift stations.
- Corrosion of support brackets within LS A-16, FS-101 and LS-1.
- Corrosion of check valve in lift station LS F-7.
- Corroded hatches at lift stations LS-1 and LS FS-101.
- Corroded frames, castings, drop pipe support brackets at manholes throughout the system.
- Exposed aggregate in manhole walls, indicative of corrosion.

The existing DCRWD flow meter is located in Chesterfield – at the Walbridge Acres Park. Based on conversations with Chesterfield and BL Anderson, an equipment service company, it was noted that the existing ultrasonic transducer is currently out of service and has been for some time. The transducer is in the 12-inch sewer that conveys wastewater flow to the WWTP in Chesterfield. With the DCRWD flow meter out of service, flow readings occur at the flow meter located at the Chesterfield WWTP. This is problematic because it forces the Chesterfield WWTP operator to estimate the percentage of flow contributed by Daleville to the WWTP.

The Daleville flow meter location has already been moved once within the interceptor because it kept getting damaged at the original location. Now it is being damaged at the new location. In-so-much, a different metering scheme needs to be considered. Daleville needs at least one functioning flow meter on the interceptor to accurately measure how much their system contributes to overall flow at Chesterfield's WWTP. This is important because for many reasons, including (1) maintaining the ability to quantify actual Daleville flows for payment purposes, and (2) maintaining a metered record of Daleville system response during times of wet weather events (i.e. rain or snow) for gross quantification of the I&I impact to the Daleville sewers.

Per the 2013 assessment, each Daleville lift station has a SCADA system. However, SCADA systems must be updated about every 10 years due to advancements in technology. The electrical systems were also noted to as not meeting Class 1 Division 1 code requirements. Since all the lift stations were installed over 10 years, and do not meet current electrical code and since the existing monitoring systems are antiquated, it would be prudent to address both as part of any improvements project.

C. Reasonable Growth

As presented in **Section 1-Project Planning**, the increase in population is expected to be minimal during the planning period. However, the average wastewater flows are still anticipated to grow over the next 20 years. As the system continues to age, its capacity to connect new services may be limited due to increasing I&I. In this section, an evaluation of the current and future capacity requirements of the lift stations and main sewers is summarized.

There are five (5) wastewater lift stations in Daleville's collection system. All lift stations are duplex submersible-type lift stations. Additional lift station data is provided in **Table 2-2.** Lift stations LS FS-101 and LS 1 are in business/commercial designated areas of the Town. LS-800 is immediately adjacent to business/commercial designated areas of the Town, but technically sits on property outside of Town limits.

Conversely, LS A-16 and LS F-7 are in mostly residential areas. From **Section 1 – Project Planning**, an annual growth rate of 0.3% was utilized for the planning period. Therefore, it is assumed that population within the sewer basins of each lift station will increase accordingly.

Since actual wastewater flows in each lift station sewer basin are not available, design flow rates as described in the Indiana Administrative Code (IAC) were used. These were determined from the number of homes and businesses served by each lift station. **Table 3-1** presents an analysis of each lift station.

Table 3-1
Lift Station Evaluation

Lift Station	Estimated Current Peak Flow (GPM)	Estimated Future Peak Flow (GPM)*	Capacity with One Pump Running (GPM)	% Capacity with Future Flows	Under 90 % Capacity in Both Timeframes
LS FS-101	54.4	55.0	60	91.7%	No
LS 1	9.7	10.0	60	16.7%	Yes
LS F-7	94.3	95.0	60	158.3%	No
LS A-16	58.0	59.0	60	98.3%	No
LS 800	15.25	16.0	60	26.7%	Yes

**Based on a 0.3% population increase*
*** Data not available*

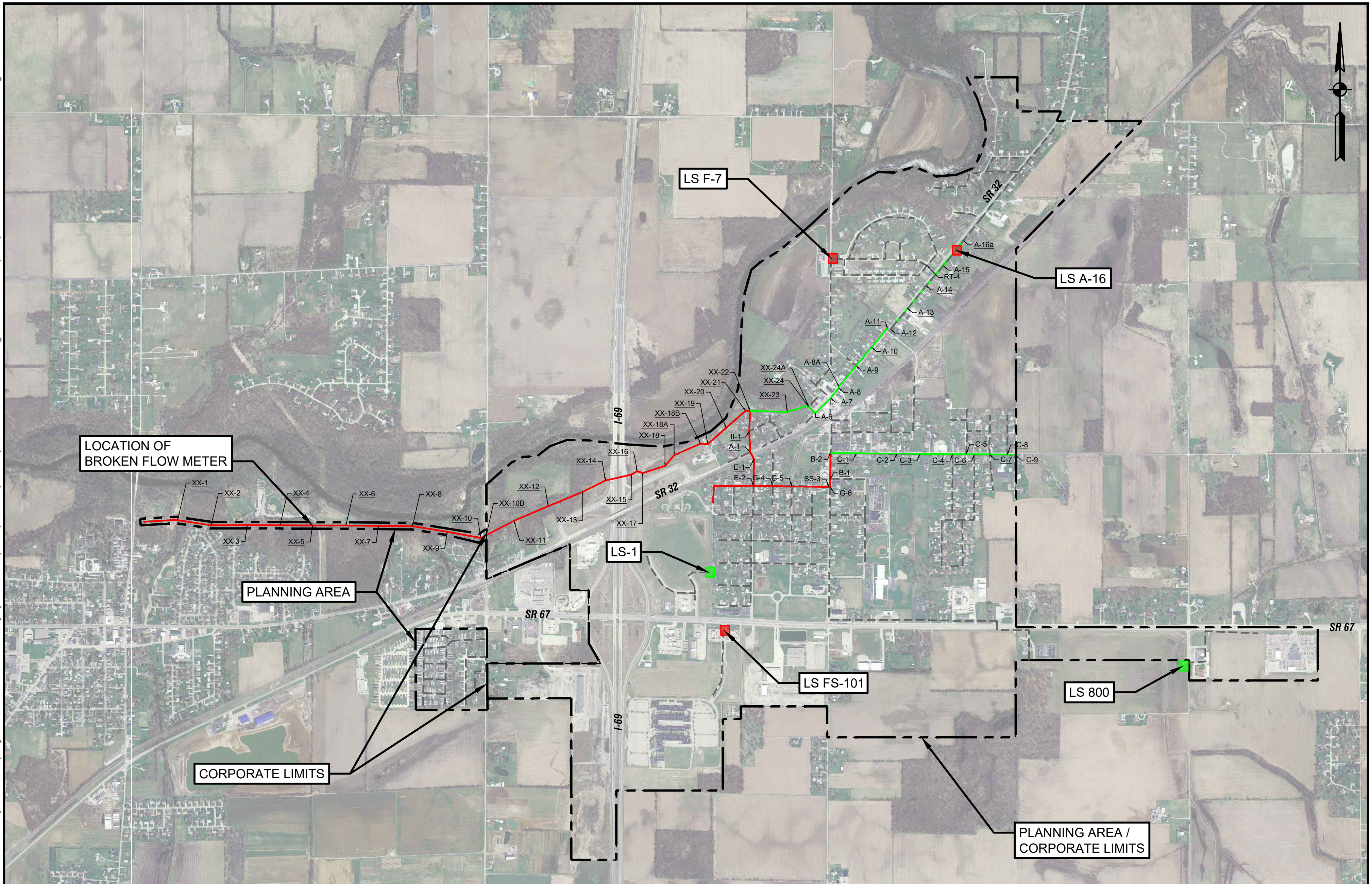
As shown in the table above, LS FS-101, LS F-7, and LS A-16 are all over 90% of their capacity rating. In fact, LS F-7 is well over 100% of its rated capacity. This, in concert with the noted velocity concerns, shows there is a need now for pump capacity increases. This also shows there is a need for mitigating I&I by removing potential sources.

Similarly, an evaluation of the main trunk sewers was performed to ensure the collection system has enough capacity to convey current and future wastewater flows. The evaluated sewers and lift stations are shown in **Figure 3-2**. These sewers collect most of the flow and direct it to the 12-inch interceptor, which conveys flow to the WWTP in Chesterfield. **Table 3-2** shows the diameter of the sewer segments which were analyzed for capacity and color coded on **Figure 3-2**.

To identify current and future capacity requirements, the existing trunk sewers were evaluated based on the Manning's Equation for Open Channel Flow. Typically, during wet weather events, pipes will surcharge and behave more like a pressure application. However, identifying where surcharge is anticipated by applying the IAC flow parameters provides us with a good indicator of where our sewers may be challenged.

The pipe assessment shown in **Figure 3-2** and **Table 3-2** is used to illustrate how close a sewer segments is to transitioning from an open channel flow environment to one of pressure during a typical peak day event (i.e. a surcharged sewer). Anything greater than or equal to 100% is anticipated to be operating in a pressure environment. It is standard design practice to size sewers to maintain an open channel flow environment. For this analysis, we identify any sewers receiving more than 90% of their design capacity as being "challenged" and receiving more than 100% as deficient during peak daily flow events. **Table 3-2** presents the current and estimated future peak daily flows and the available open channel flow capacity through the sewer.

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader



LEGEND

- CORPORATE LIMITS / WASTEWATER PLANNING AREA
- EXISTING SEWER PIPES
- INSUFFICIENT FUTURE CAPACITY ESTIMATED
- SUFFICIENT FUTURE CAPACITY ESTIMATED
- INSUFFICIENT FUTURE CAPACITY
- SUFFICIENT FUTURE CAPACITY

SCALE: 1"=2000'

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER FACILITY CONCERNS
FIGURE 3-2

Table 3-2
Trunk Sewer Evaluation

From MH	To MH	Sewer Diameter (Inches)	Limiting Segment Available Capacity	Current Peak Daily Flow (GPD)	Capacity Used (%)	Estimated Future Peak Daily Flow (GPD)	Capacity Used (%)
C-9	**B-2**	8	440,656	207,830	47%	220,080	50%
XX-22	**XX-1**	12	1,061,865	882,396	83%	932,466	90%
B-2	**XX-22**	10	505,819	440,563	87%	581,489	115%
A-16	**XX-22**	8 and 10	489,914	64,975	13%	264,985	54%

Based on this evaluation the pipe segments from Manholes XX-22 to XX-1 (the entire interceptor to Chesterfield) are at 90% capacity. As stated earlier, this segment is noted to be challenged. Also, and the pipe segments from B-2 to XX-22 are over the 100% capacity limit making this segment deficient. These two segments that are at or past the 90% capacity limit are due to the I&I problems located within the collection system. There is a need for mitigating I&I by removing potential sources. As mentioned earlier in this section, direct exposure to sewage by means of SSOs presents a significant risk to human and environmental health. It is recommended that the Town acts to address the issue of I&I utilizing the open channel flow capacity assessment in conjunction with available inspection information as means of prioritizing and schedule necessary corrective actions and improvements.

The below **Table 3-3** lists primary components of the wastewater collection system, priority of improvements, and relevant summary information. Improvements priorities are noted to be high, medium, or low priority. High priority projects are those which should be completed first and in the first five (5) years. Medium priority projects are those that should be completed after high priority projects are done. Low priority projects are those that can be considered after all high and medium priority projects are done and/or addressed as part of the utility's routine operation and maintenance. Low priority projects are those that should be considered but at this time are not critical to maintaining infrastructure.

Table 3-3
Existing System Prioritizing

Asset	Priority	Discussion
LS FS-101	High	Lift Station is under capacity and does not meet Class 1 Div. 1 code requirements. SCADA system requires upgrade and integration into Daleville.
LS 1	High	Velocity through the force main does not meet requirement. The lift station does not meet Class 1 Div. 1 code requirements. SCADA system requires upgrade and integration into Daleville.
LS F-7	High	Lift Station is under capacity and does not meet Class 1 Div. 1 code requirements. SCADA system requires upgrade and integration into Daleville.
LS A-16	High	Lift Station is under Capacity and does not meet Class 1 Div. 1 code requirements. SCADA system requires upgrade and integration into Daleville.
LS 800	High	Velocity through the force main does not meet requirement. The lift station does not meet Class 1 Div. 1 code requirements. SCADA system requires upgrade and integration into Daleville.
Flow Metering	High	The existing meter is noted to be in a constant state of disrepair. Quantification of I&I along the interceptor and ability to accurately reflect flows for billing purposes are non-existent and require remedy.
Trunk Sewers	High/Medium	The trunk sewers shown to be challenged when employing growth and IAC design requirements should be addressed. Coupled with I&I concerns would mandate a high priority repair.
All Other Sewers	Medium/Low	Remaining sewers will be evaluated, and high priority I&I issues will be corrected as part of any initial project. Medium to Low Priority items will be evaluated based upon funds available and their scheduled rehabilitation dates will reflect same.

3.2 Storm Water

A. Health, Sanitation and Security

As mentioned in **Section 2- Existing Facilities** flood areas exist throughout Daleville. These areas exist due to lack of storm water collection infrastructure or due to undersized existing storm water collection infrastructure. These areas present the potential to flood basements, create property damage, cause unsafe road conditions, or even cause erosion of the railroad tracks. These also can add to I/I in the wastewater system. Flooding areas also can present a threat to human and environmental health by providing a breeding ground for many insects, including mosquitoes that can transmit diseases. It is recommended that the Town acts to address this issue.

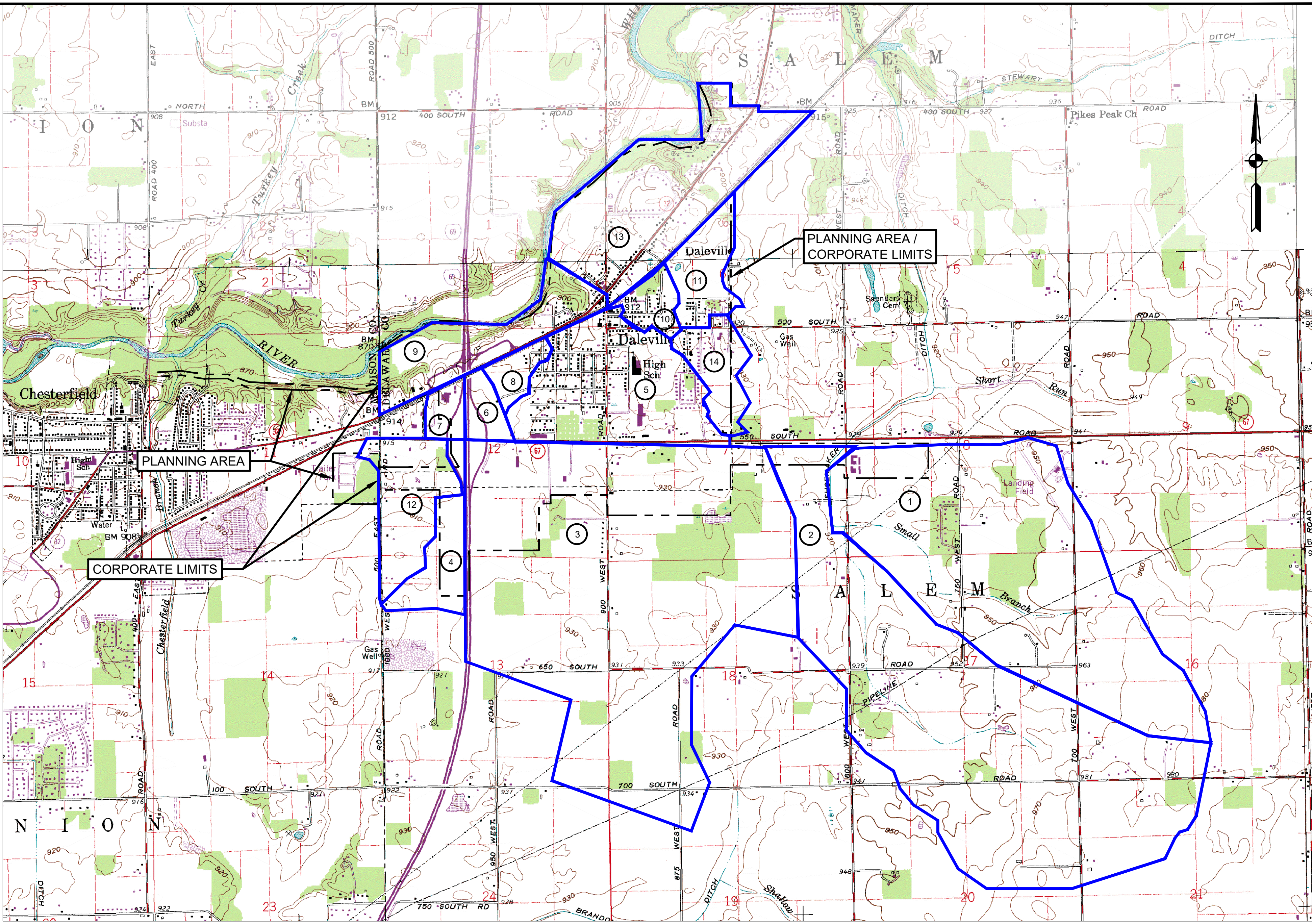
A watershed analysis was performed utilizing the rational method for runoff flows. It was determined that within Daleville fourteen (14) different drainage basins are present. **Table 3-4** shows total area, basin runoff coefficients, rainfall intensity in inches per hour, and peak runoff in cubic feet per second (CFS) for each basin. **Table 3-4** also breaks the basin areas and runoff coefficients between portions of the basins within the storm water planning area (in Town) and portions outside the storm water planning area which eventually flow into Town. **Figure 3-3** illustrates these fourteen (14) drainage basins.

Table 3-4
Peak Runoff Flow Rates

Basin	Total Area	Area inside Town	Area outside of Town	C Factor Inside of Town	C Factor Outside of Town	Intensity*	Peak Runoff
Units	**Acres**	**Acres**	**Acres**			**in/hr.**	**CFS**
1	716.15	37.46	678.70	0.50	0.30	2.01	446.90
2	932.35	18.68	913.67	0.30	0.30	2.01	562.21
3	1,105.77	272.14	833.63	0.58	0.29	2.01	794.80
4	63.94	37.57	26.36	0.25	0.32	2.01	35.84
5	318.09	318.09	N/A	0.28	N/A	2.01	175.83
6	29.34	29.34	N/A	0.20	N/A	2.01	11.79
7	113.83	23.63	90.19	0.39	0.45	2.01	100.11
8	28.10	28.10	N/A	0.19	N/A	2.01	10.73
9	157.09	157.09	N/A	0.33	N/A	2.01	104.20
10	36.02	36.02	N/A	0.28	N/A	2.01	20.27
11	72.73	70.97	1.77	0.30	0.30	2.01	43.86
12	70.96	68.86	2.10	0.36	0.30	2.01	51.09
13	307.17	289.27	17.89	0.28	0.25	2.01	168.89
14	25.73	18.28	7.46	0.45	0.42	2.01	22.83

**Intensity is based off the 10-year 1-hour storm found on the NOAA website.*

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader



DRAINAGE BASIN BOUNDRIES

SCALE: 1"=3000'

3000' 0 3000'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

DRAINAGE BASINS
FIGURE 3-3

The watershed analysis was performed to check the existing storm water collection system for capacity. Storm water sewers are typically designed to convey the peak runoff flow from a 10-year, 1-hour storm event. This is the amount of flow which would occur from a rain event which has a probability to occur once every 10 years lasting for one (1) hour. The resulting capacity analysis is provided in **Table 3-5 & 3-6. Table 3-5** identifies all existing storm pipe that is adequate in capacity. **Table 3-6** identifies all capacity deficient storm pipe.

Table 3-5
Sufficient Capacity Pipes in Storm Water Collection System

From MH	To MH	Pipe ID #	Pipe Diameter (Inches)	Runoff (MGD)	Pipe Capacity (MGD)	Total Incoming Flow (MGD)	Difference (MGD)
1	2	3	15	1.83	1.89	1.83	0.06
3	2	4	12	0.51	0.69	0.51	0.18
7	8	9	15	0.90	1.12	0.90	0.22
10	9	11	12	0.58	1.13	0.58	0.55
12	11	13	12	1.16	1.29	1.16	0.13
11	13	14	15	0.82	2.33	1.98	0.35
20	18	23	12	1.87	1.54	0.81	.073
36	34	36	12	0.71	0.84	0.71	0.13
30	31	37	12	0.78	0.80	0.78	0.02
43	44	38	24	0.68	7.85	0.68	7.17
42	39	39	15	0.21	3.62	0.21	3.41
44	45	40	24	0.38	8.02	1.06	6.96
45	46	41	24	0.13	8.78	1.19	7.59
46	OF*	42	24	0.20	9.42	1.39	8.03
49	50	43	15	0.94	1.94	0.94	1.00
51	48	45	24	1.91	5.07	4.45	0.62
47	48	46	12	0.76	0.80	0.76	0.04
54	48	47	15	0.19	3.52	0.73	2.79
52	54	48	15	0.36	1.45	0.36	1.09
53	54	49	12	0.18	0.80	0.18	0.62
48	55	52	24	0.04	9.55	5.98	3.57
55	OF*	53	24	0.47	11.56	6.45	5.11

*OF refers to outfall

Table 3-6
Deficient Capacity Pipes in Storm Water Collection System

From MH	To MH	Pipe ID #	Pipe Diameter (Inches)	Runoff (MGD)	Pipe Capacity (MGD)	Total Incoming Flow (MGD)	Differenc e (MGD)
4	6	6	12	9.1	0.84	9.1	-8.26
5	6	7	12	0.88	0.84	0.88	-0.04
6	8	8	18	0.51	2.47	10.49	-8.02
8	9	10	24	1.19	4.39	12.58	-8.19
14	13	15	24	0.37	5.07	20.06	-14.99
13	15	16	24	1.47	4.67	23.51	-18.84
16	15	17	15	3.22	1.25	3.22	-1.97
15	17	18	24	1.31	9.00	28.04	-19.04
17	OF*	19	24	0.75	18.97	28.79	-9.82
38	39	20	36	1.01	36.30	44.69	-8.39
39	40	21	36	0.23	22.17	45.13	-22.96
40	41	22	36	0.91	22.17	46.04	-23.87
18	21	24	15	1.87	2.38	2.68	-0.30
22	21	25	18	3.53	4.04	7.01	-2.97
23	22	26	12	3.48	1.70	3.48	-1.78
21	24	27	24	1.25	7.60	10.94	-3.34
25	24	28	24	2.32	5.07	22.47	-17.40
26	25	29	18	5.07	2.04	17.5	-15.46
31	25	30	15	1.87	1.45	2.65	-1.20
32	27	31	12	0.55	1.10	12.43	-11.33
27	26	31a	12	0.55	1.10	15.5	-14.40
28	27	32	18	1.5	2.04	11.4	-9.36
29	28	33	12	5.36	1.81	5.36	-3.55
33	28	34	15	1.23	1.25	4.54	-3.29
35	33	35	12	0.79	0.69	0.79	-0.10
34	33	36a	12	1.81	0.84	2.52	-1.84
50	51	44	15	1.6	1.94	2.54	-0.60
24	37	51	24	10.69	0.94	33.75	-23.06
57	56	54	10	3.52	0.94	3.52	-2.58
56	37	55	12	3.09	1.54	6.61	-5.07
37	38	56	36	3.32	36.30	43.68	-7.38
58	14	57	18	1.01	1.97	19.69	-17.72
59	58	58	18	1.86	1.97	18.68	-16.71
60	59	59	18	2.21	1.97	16.82	-14.85
61	60	60	12	3.42	1.13	14.61	-13.48
62	61	61	12	11.19	0.96	11.19	-10.23

*OF refers to outfall

In **Tables 3-5 and 3-6** above, the runoff column refers to the amount of runoff flowing into that specific catch basin. The total incoming flow refers to all flow coming from upstream pipes plus the flow from runoff. The difference column shows a negative number if the incoming flow exceeds the pipe capacity. Based on the collection system analysis completed, the majority of Daleville's existing storm water infrastructure cannot adequately convey a 10-year, 1-hour storm event.

Not shown in the tables, but within Daleville is an 84-inch pipe that runs from a box culvert under SR 67 to a box culvert that runs under the railroad. The capacity of the pipe is 51 MGD, well the capacity of the box culvert under SR 67 is 46MGD. Since the pipe can carry the flow from the culvert, the pipe is assumed to be sufficient.

As mentioned earlier, the Town has noted several areas of concern due to flooding or standing water. These issues are a result of nonexistent or inadequate storm water collection and conveyance facilities. These issues are considered to be a high priority and should be resolved to prevent future damage to infrastructure or personal property and the potential for adverse impact to human health due to conveyance of disease vectors. **Figure 3-4** illustrates the existing deficient storm water conveyance piping within the system along with Daleville's noted flooding areas of concern.

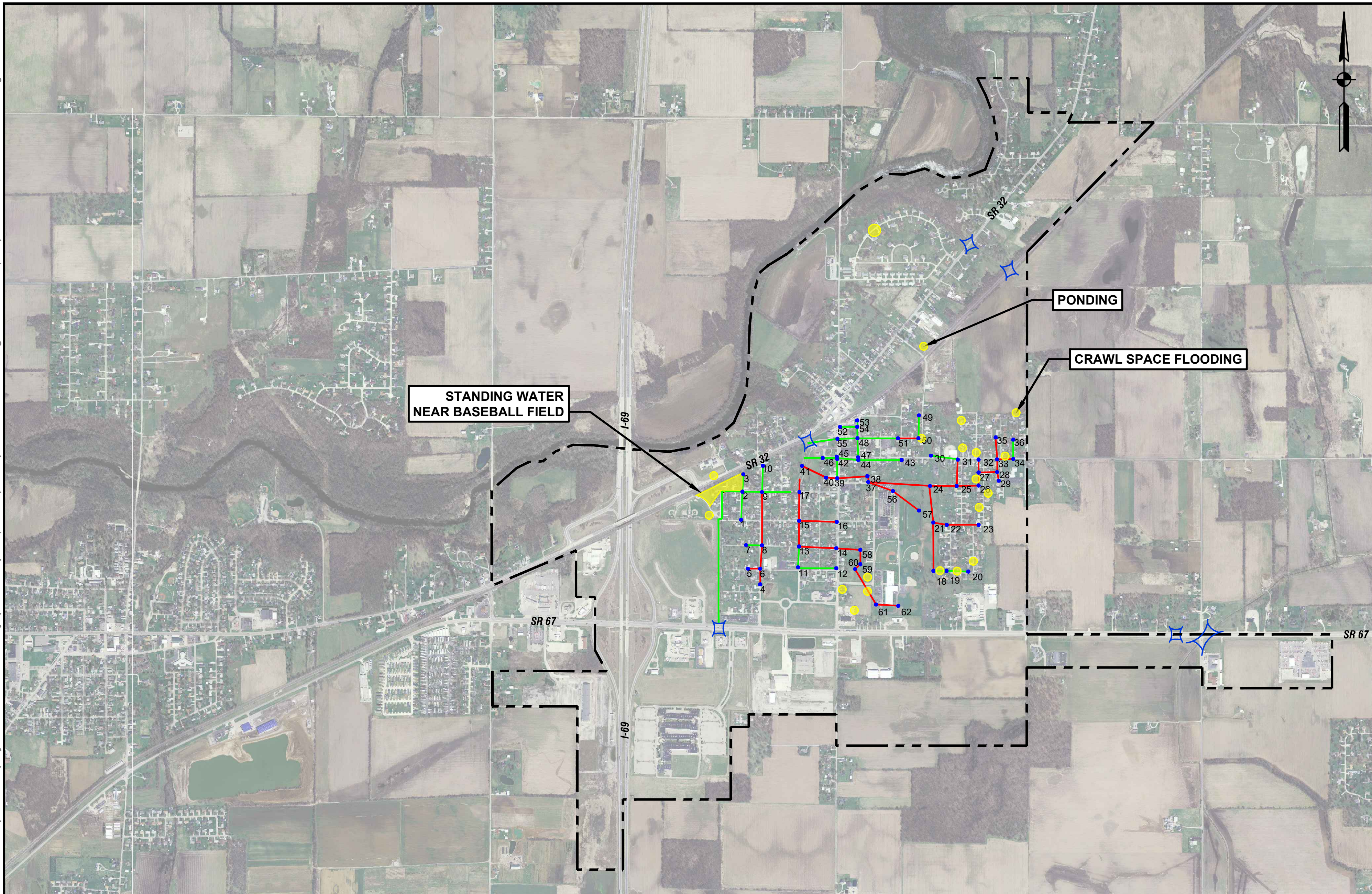
B. Aging Infrastructure

Plans and as-builts were discussed in **Section 2 – Existing Facilities**. The first set of plans on record were from 24 years ago, although much of the system within Town is believed to be older. In the case of the storm water collection system, age of the infrastructure is not contributing as much to the problems as lack of capacity and coverage. Many parts of the storm system have insufficient capacity per the analysis in this report and may experience further reductions as the system ages. Additionally, many locations within Daleville have no storm water facilities at all to alleviate the flooding areas of concern. The largest, and therefore most notable, area of concern is the flooded area near the railroad tracks and the baseball field on the southeast side of the intersection of I-69 and S.R. 32 as shown in **Figure 3-4**.

C. Reasonable Growth

As mentioned in **Section 1- Project Planning** Daleville is expected to experience modest growth within the next 20 years. As growth occurs, so will the production of overland flow, increasing the storm water volume that must be captured and conveyed. Even with storm water regulations in place to control runoff from new developments, much of the existing system will be further strained because it already is undersized. If the storm water collection system capacity does not improve, flooding will continue to occur and increase in frequency. Storm water infrastructure improvements would address existing issues and provide accommodations necessary for future growth.

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader



LEGEND

- CORPORATE LIMITS / STORMWATER PLANNING AREA
- EXISTING INDOT OR RAILROAD CULVERT
- FLOODING / PONDING AREA
- SUFFICIENT CAPACITY
- DEFICIENT CAPACITY

NOTE: ALL AREAS NOTED AS CONCERNS IN THIS FIGURE RELATE TO FLOODING OR STANDING WATER UNLESS SPECIFICALLY NOTED.

SCALE: 1"=2000'

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORMWATER FACILITY CONCERNS
FIGURE 3-4

Table 3-7 presents an inventory of storm water components along with priority for remedy. The prioritizations are listed as high, medium, and low and conform to the descriptions provided above in Section 3.1.C.

Table 3-7
Existing System Prioritizing

Asset	Priority
Baseball Field Flooding	High
Remaining Flooding Areas	High/Medium*
Capacity Deficient Pipes	Medium/Low**

*The high/medium prioritization for remaining flooding areas are premised upon input from Daleville to determine priorities specific to cost of remedy.

**The medium/low prioritization for capacity deficient pipes is premised upon connected areas of flooding which will be routed through said pipes and corresponding requirements to upsize (i.e. if an area is connected and routed through a capacity deficient pipe, it will drain, it will just take a longer time to drain. The impact of standing water to the flooded area being addressed must be considered in identification of priority for remedy).

Section 4 – Proposed Alternatives

4.1 Wastewater

A. Description

As described in **Section 3 – Future Situation** there are deficiencies with the system. Deficiencies include:

- Collection system I&I
- Hydraulic overloading of three (3) lift stations,
- Outdated Lift Stations Electrical and SCADA systems,
- Lack of a reliable flow metering (flows to Chesterfield for Treatment).

Below, three (3) alternatives are identified to address these deficiencies, along with a fourth no action alternative. Cost estimates have also been assembled for each alternative**.**

B. No Action Alternative

1. Description

If no action is taken to address the issues, the existing wastewater collection system will continue to deteriorate and experience worsening I&I. In turn, flows will increase to the Chesterfield WWTP resulting in an increased cost for treatment. Further, risk of SSOs increases which would then result in regulatory/enforcement action not to mention presenting a risk to human health and the environment from the untreated sewage flowing overland or discharging within basements of homes.

If no corrective action is taken LS A-16 will continue to surcharge during wet weather events and present a heightened risk of sewer backup potentially resulting in basement flooding and additional SSOs.

If no action is taken, the existing lift station electrical systems will remain as they are. These systems do not meet current requirements (Class 1, Division 1). This electrical code is intended to prevent explosion hazards. Further, given the age of the electrical, it will become harder to find replacement parts and maintain function.

The existing SCADA system is outdated and not specific to the Daleville Utility. Having no means of monitoring the lift stations could result in failed pumps causing wastewater sewer surcharges and potentially SSOs that could otherwise be preventable through human intervention.

The observed corrosion of valves, hatches, LS guide rail supports brackets, pipe etc. will continue unabated increasing the risk of a future failure resulting in non-operational stations and sewer system backups/ SSOs.

Finally, if no action is taken to monitor the flow leaving the Daleville system into Chesterfield plant then Daleville will continue to be out of compliance with its contract with its treatment provider and could jeopardize this resource – not to mention an increased likelihood of receiving incorrect billing of usage.

C. Alternative #1

1. Description

Alternative #1 consists of a complete assessment and rehabilitation of the entire wastewater collection system including sewer and lift stations. Namely,

- Complete rehabilitation of existing sewers, manholes, and laterals within public right-of-way
- Three (3) new flow metering facilities
- Rehabilitation of all existing lift stations including:
  - Structural Repairs
  - Replacement of ancillary equipment (pipe, valves, etc.)
  - New pumps
  - New Controls
  - Upgraded Electrical Service
- New SCADA

Alternative #1 includes cleaning and televising all sewers in support of rehabilitation and/or replacement means and methods. Alternative #1 also accounts for rehabilitation of each lateral within the right-of-way. Since the number of pipe locations which may need to be replaced will not be known until after the televising and assessment is completed, a one-point repair per mile of sewer assumption was utilized for cost estimation purposes (which is in-line with other communities Commonwealth has worked with in the past with similar systems).

Alternative #1 includes replacing the pumps at all five (5) duplex lift station. This replacement would change each pump from a capacity of 60 GPM to 120 GPM. Each lift station will also be rehabilitated to meet industry standard and to limit I&I. This would include structural and mechanical rehabilitation due to corrosion, electrical system upgrades, and SCADA replacement for each lift station. The electrical system upgrades will bring the stations into Class 1, Division 1 code compliance.

Alternative #1 will also include adding three (3) flow meters to the system. The first flow meter will be located on the edge of Daleville corporate limits on the 12-inch interceptor. The second will be located at the end of the 12-inch interceptor located in Chesterfield. The last would be located on the sewer line that connects into the 12-inch interceptor outside Daleville corporate limits from the Laurelwood and Royal Oaks neighborhoods. These three (3) locations will provide Daleville the ability to determine integrity of the interceptor from Daleville to Chesterfield affording corrective action as necessary. **Figure 4-1** illustrates the above described alternative.

a. Design Criteria

The current capacity of the pumps is 60 GPM. All pumps discharge through a 4-inch force main. Flow through a 4-inch force main produces a velocity of 1.50 fps. Increasing the pump capacity to 120 GPM will result in a velocity of 3 fps. This increased velocity is required to suspends the solids in the pipe and reduce deposition. Further, the increased capacity will also mitigate high weather flow requirements.

The three (3) flow meters are anticipated to be Parshall flumes with 6-inch throats. The range of flows a 6-inch throat can handle is 24 GPM to 1,750 GPM.

2. Environmental Impact

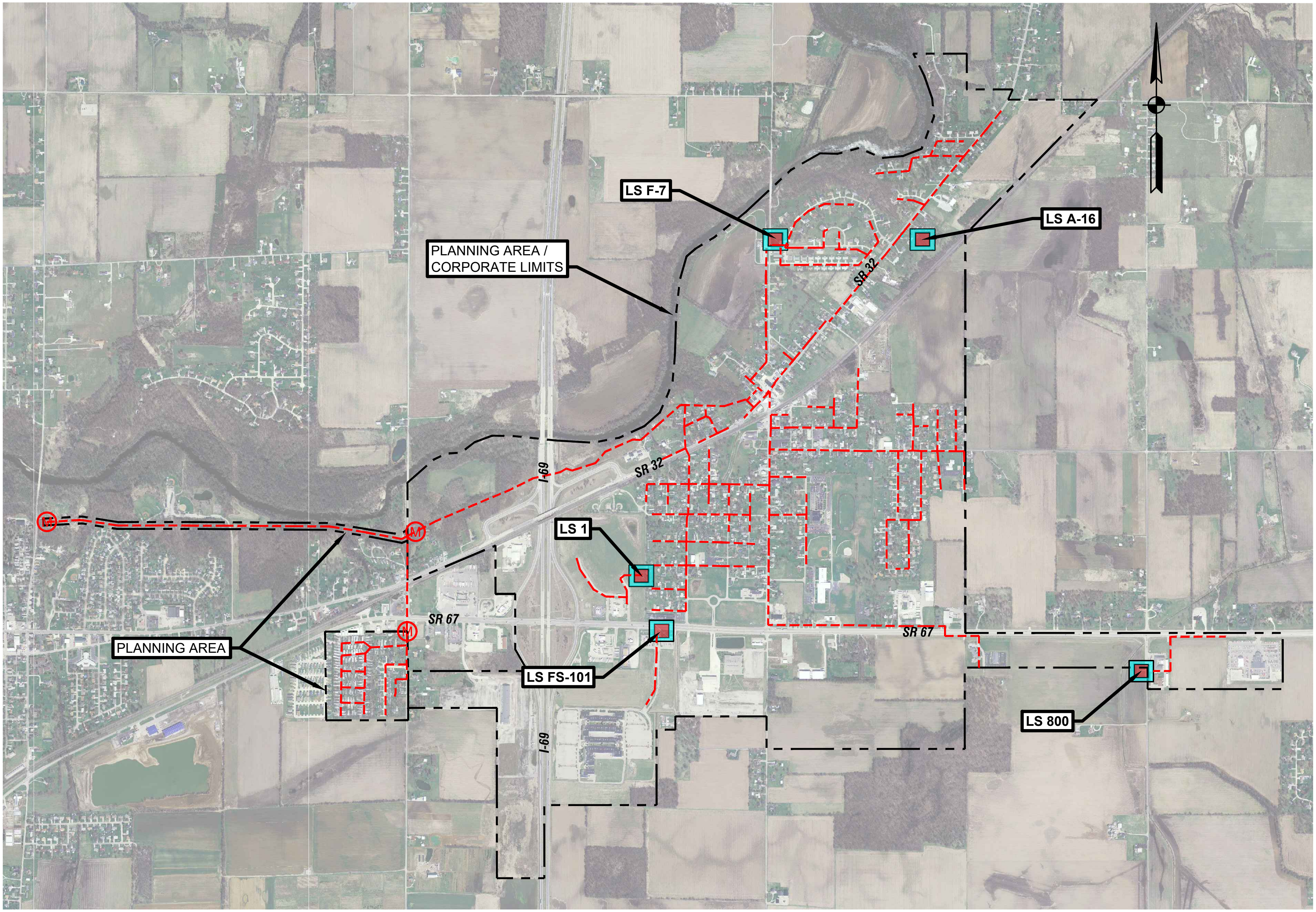
With an increase in capacity at all five (5) lift stations, an IDEM sanitary sewer permit will be required. In addition, LS F-7 is in a floodplain, therefore any proposed changes to the structure of this lift station will consider the floodplain elevation. Debris collected from the wastewater collection system during cleaning will be appropriately collected and disposed.

3. Land Requirements

No additional land access or acquisition is anticipated.

4. Potential Construction Problems

Minimal construction challenges are anticipated for this alternative. Temporary construction impacts include the potential for noise, dust, and requirements for erosion control, which will be addressed by defining the limitations on construction work within the contract documents during the design phase. All collection system improvements proposed are to existing sewer lines and manholes. The existing wastewater infrastructure lies within road rights-of-way or easements; making it accessible. In some cases, access will require going off roads such as along the interceptor to Chesterfield. Since much of the infrastructure is within rights-of-way, access to homes and maintenance of traffic will be required. By-pass pumping may be required for point repairs or sewer rehabilitation during construction. The work associated with these upgrades is expected to be completed during normal working hours. Erosion control measures include drainage inlet protection and offsite sedimentation control. Dust control will be specified in the contract documents and be required to be implemented in accordance with current practices.



LEGEND

- CORPORATE LIMITS / PLANNING AREA
- SANITARY SEWERS, LATERALS, AND MANHOLES TO BE CLEANED, TELEVISED, AND REHABILITATED
- PROPOSED FLOW METER
- PUMP UPGRADE AND REHABILITATION
- ELECTRICAL REHABILITATION AND SCADA

SCALE: 1"=2000

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER ALTERNATIVE 1
FIGURE 4-1

5. Cost Estimate

Table 4-1 summarizes the estimated capital costs for this alternative.

Table 4-1
Alternative #1 Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$462,300
Erosion Control	$138,700
Traffic Control	$296,000
Bypass Pumping	$120,000
Pump Upgrade and Rehabilitation	$450,000
Electrical Rehabilitation And SCADA	$120,000
Clean and Televise	$416,900
Rehab Manholes and CIPP	$5,323,800
Point Repair and Lateral work	$2,858,400
Parshall Flume, I&C and Structure	$75,600
Subtotal	**$10,261,700**
Contingency (10%)	$1,026,200
Total Construction Costs	**$11,287,900**
Estimated Non-Construction Costs	
Non-Construction Costs	$2,822,700
Total Non-Construction Costs	**$2,822,700**
Total Capital Costs	**$14,110,600**

6. Operation & Maintenance (O&M) & Short-Lived Assets (SLA)

Table 4-2 shows the new annual O&M costs for Alternative #1. This analysis assumes the treatment plant costs are constant (though they likely will decrease once the I&I is addressed). The remaining line items are estimated costs to operate the wastewater collection system on an annual basis.

Table 4-2
Alternative #1 New Annual O&M Costs

Description	Total
Treatment Plant Costs (Paid to Chesterfield)	$234,336[1]
1 Laborer Salary	$40,000
Electrical Costs	$11,000
Supplies, Gas, Etc.	$10,000
Materials, Repairs, Etc.	$50,000
Total Annual O&M	**$345,336**

[1]The cost has been determined by multiplying the number of residential customers ($652) by the residential monthly treatment charge (27.13) by 12 months in a year and by multiplying the number commercial customers (42) by the commercial monthly treatment charge ($42.50) by 12 months in a year.

((652 x $27.13) +($42.50 x 42)) x 12 =$234,336

Table 4-3 shows the short-lived assets for Alternative #1. Short-lived assets consist of equipment with a useful life shorter than the planning period.

Table 4-3
Alternative #1 New Annual Short-Lived Assets

Description	Replacement Cost	Useful Life	Total
Lift Station F-7 Pumps and Controls	$50,000	15	$3,333
Lift Station A-16 Pumps and Controls	$50,000	15	$3,333
Lift Station LS-1 Pumps and Controls	$50,000	15	$3,333
Lift Station 800 Pumps and Controls	$50,000	15	$3,333
Lift Station FS-101 Pumps and Controls	$50,000	15	$3,333
Ultrasonic Flow Meters (3)	$7,500	20	$375
SCADA	$50,000	10	$5,000
Total Short-Lived Assets			**$22,040**

D. Alternative #2

1. Description

Alternative #2 consists of:

- A complete assessment and rehabilitation of the entire wastewater collection system including manholes (no lateral rehabilitation within public right-of-way)
- Replacing three (3) of the five (5) duplex lift station pumps
  - Structural Repairs
  - Replacement of ancillary equipment (pipe, valves, etc.)
  - New pumps
  - New Controls
  - Upgraded Electrical Service
- Rehabilitate the remaining two (2) duplex lift stations
  - Electrical System Upgrades

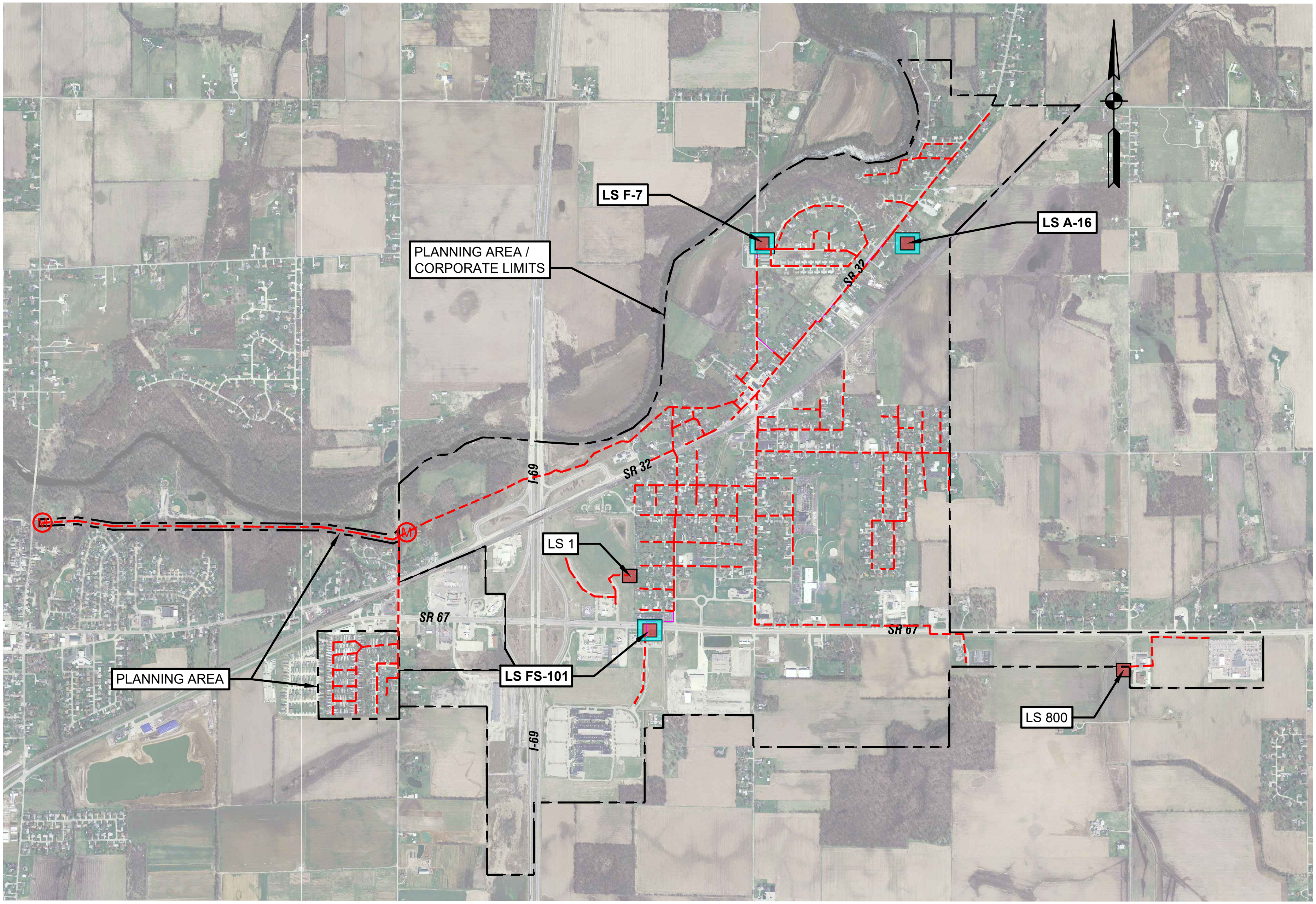
- New SCADA
- Two (2) new Parshall Flume style flow metering facilities

Alternative #2 includes cleaning, televising, assessing, and either rehabilitating or replacing sewer pipe. Manhole will also be assessed and rehabilitated or replaced. Unlike Alternative #1, Alternative #2 does not include any work associated with laterals. As with Alternative #1, the number of pipe locations which may need to be replaced will not be known until after the televising and assessment is completed. For this report, it is assumed one-point repair will be needed for every mile of sewer.

Alternative #2 includes replacing the pumps at three (3) of the five (5) duplex lift stations. The three (3) lift stations are LS F-7, LS A-16, and LS FS-101. This replacement would change each pump from a capacity of 60 GPM to 120 GPM. These three (3) lift stations will also be rehabilitated to address any structural and ancillary equipment and material deficiencies.

All five (5) lift stations will receive electrical system upgrades and SCADA replacement. The electrical system upgrades will bring the stations up to meeting the Class 1, Division 1 code requirements.

Finally, Alternative #2 will include adding two (2) flow meters to the system. The first flow meter will be located on the edge of Daleville corporate limits on the 12-inch interceptor. The second will be located at the end of the 12-inch interceptor located in Chesterfield. **Figure 4-2** shows the entire wastewater system that will be cleaned and televised, along with the locations of the flow meters and the lift stations to be upgraded.



G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader

LEGEND

- CORPORATE LIMITS / PLANNING AREA
- SANITARY SEWERS AND MANHOLES TO BE CLEANED, TELEVISED, AND REHABILITATED
- PROPOSED FLOW METER
- PUMP UPGRADE AND REHABILITATION
- ELECTRICAL REHABILITATION AND SCADA

SCALE: 1"=2000

2000' 0 2000'

COMMONWEALTH ENGINEERS, INC.™
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER ALTERNATIVE 2
FIGURE 4-2

a. Design Criteria

The current capacity of the pumps is 60 GPM. LS F-7, LS A-16, and LS FS-101 are under capacity during wet weather events. By replacing the existing pumps with 120 GPM pumps, not only will we provide necessary pumping capacity during wet weather, but we will also receive the added benefit of adequate scouring velocity through their respective 4-inch force mains (decreasing chance of solids deposition and odor).

The two (2) flow meters are anticipated to be Parshall flumes with 6-inch throats. The range of flows a 6-inch throat can handle is 24 GPM to 1,750 GPM. The two (2) versus three (3) meter scenarios will adequately characterize the I&I and/or illegal connections associated with the interceptor from flow Daleville to Chesterfield only if the flows from the Laurelwood and Royal Oaks neighborhoods are relatively unimpacted by wet weather.

2. Environmental Impact

With an increase in capacity at three (3) of the lift stations, an IDEM sanitary sewer permit will be required. In addition, LS F-7 is in a floodplain, therefore any proposed changes to the structure of this lift station will consider the floodplain elevation. Debris collected from the wastewater collection system during cleaning will be appropriately collected and disposed.

3. Land Requirements

No additional land access or acquisition is anticipated.

4. Potential Construction Problems

Minimal construction challenges are anticipated regarding any of the projects within this Alternative. Temporary construction impacts include the potential for noise, dust, and requirements for erosion control, which will be addressed by defining the limitations on construction work within the contract documents during the design phase. All collection system improvements proposed are to existing sewer lines and manholes. The existing wastewater infrastructure currently all lies within road rights-of-way or easements. Therefore, most of the infrastructure should be accessible. In some cases, access will require going off roads such as along the interceptor to Chesterfield. Since much of the infrastructure is within rights-of-way, access to homes and maintenance of traffic will be required. By-pass pumping may be required for point repairs or sewer rehabilitation during construction. The work associated with these upgrades is expected to be completed during normal working hours, which would restrict work related nuisances to those times. Erosion control measures include drainage inlet protection and offsite sedimentation control. Dust control will be specified in the contract documents and be required to be implemented in accordance with current practices.

5. Cost Estimate

Table 4-4 shows the total project costs for this alternative.

Table 4-4
Alternative #2 Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$327,100
Erosion Control	$98,200
Traffic Control	$209,000
Bypass Pumping	$120,000
Pump Upgrade and Rehabilitation	$270,000
Electrical Rehabilitation And SCADA	$120,000
Clean and Televise	$416,900
Rehab Manholes and CIPP	$5,323,800
Point Repair	$360,000
Parshall Flume and Controls	$50,400
Subtotal	**$7,295,400**
Contingency (10%)	$729,600
Total Construction Costs	**$8,025,000**
Estimated Non-Construction Costs	
Non-Construction Costs	$2,006,100
Total Non-Construction Costs	**$2,006,100**
Total Capital Costs	**$10,031,100**

6. O&M & SLA Costs

Table 4-5 shows the new annual O&M costs for Alternative #2. This analysis assumes the treatment plant costs are constant (though they likely will decrease once the I&I is addressed). The remaining line items are estimated costs to operate the wastewater collection system on an annual basis.

Table 4-5
Alternative #2 New Annual O&M Costs

Description	Total
Treatment Plant Costs (Paid to Chesterfield)	$234,336[1]
1 Laborer Salary	$40,000
Electrical Costs	$10,000
Supplies, Gas, Etc.	$10,000
Materials, Repairs, Etc.	$50,000
Total Annual O&M	**$344,336**

[1]The cost has been determined by multiplying the number of residential customers ($652) by the residential monthly treatment charge (27.13) by 12 months in a year and by multiplying the number commercial customers (42) by the commercial monthly treatment charge ($42.50) by 12 months in a year.

((652 x $27.13) +($42.50 x 42)) x 12 =$234,336

Table 4-6 shows the short-lived assets for this Alternative #2. Short-lived assets consist of equipment with a useful life shorter than the planning period.

Table 4-6
Alternative #2 New Annual Short-Lived Assets

Description	Replacement Cost	Useful Life	Total
Lift Station F-7 Pumps and Control Panels	$50,000	15	$3,333
Lift Station A-16 Pumps and Control Panels	$50,000	15	$3,333
Lift Station LS-1 Pumps and Control Panels	$30,000	3	$10,000
Lift Station LS 800 Pumps and Control Panels	$30,000	5	$6,000
Lift Station FS-101 and Control Panels	$50,000	15	$3,333
2 Ultrasonic Flow Meter	$5,000	20	$250
SCADA	$50,000	10	$5,000
Total Short-Lived Assets			**$31,249**

E. Alternative #3

1. Description

Alternative #3 includes:

- A complete assessment of the wastewater collection system
- Rehabilitation of the interceptor from Daleville to Chesterfield
- The proposed lift station work matches the scope identified for Alternative #2, namely:

    - Replacing three (3) of the five duplex lift station pumps
        - Structural Repairs
        - Replacement of ancillary equipment (pipe, valves, etc.)
        - New pumps
        - New Controls
        - Upgraded Electrical Service
    - Rehabilitate the remaining two (2) duplex lift stations
        - Electrical System Upgrades
- New SCADA
- One (1) new Parshall Flume style flow metering facilities

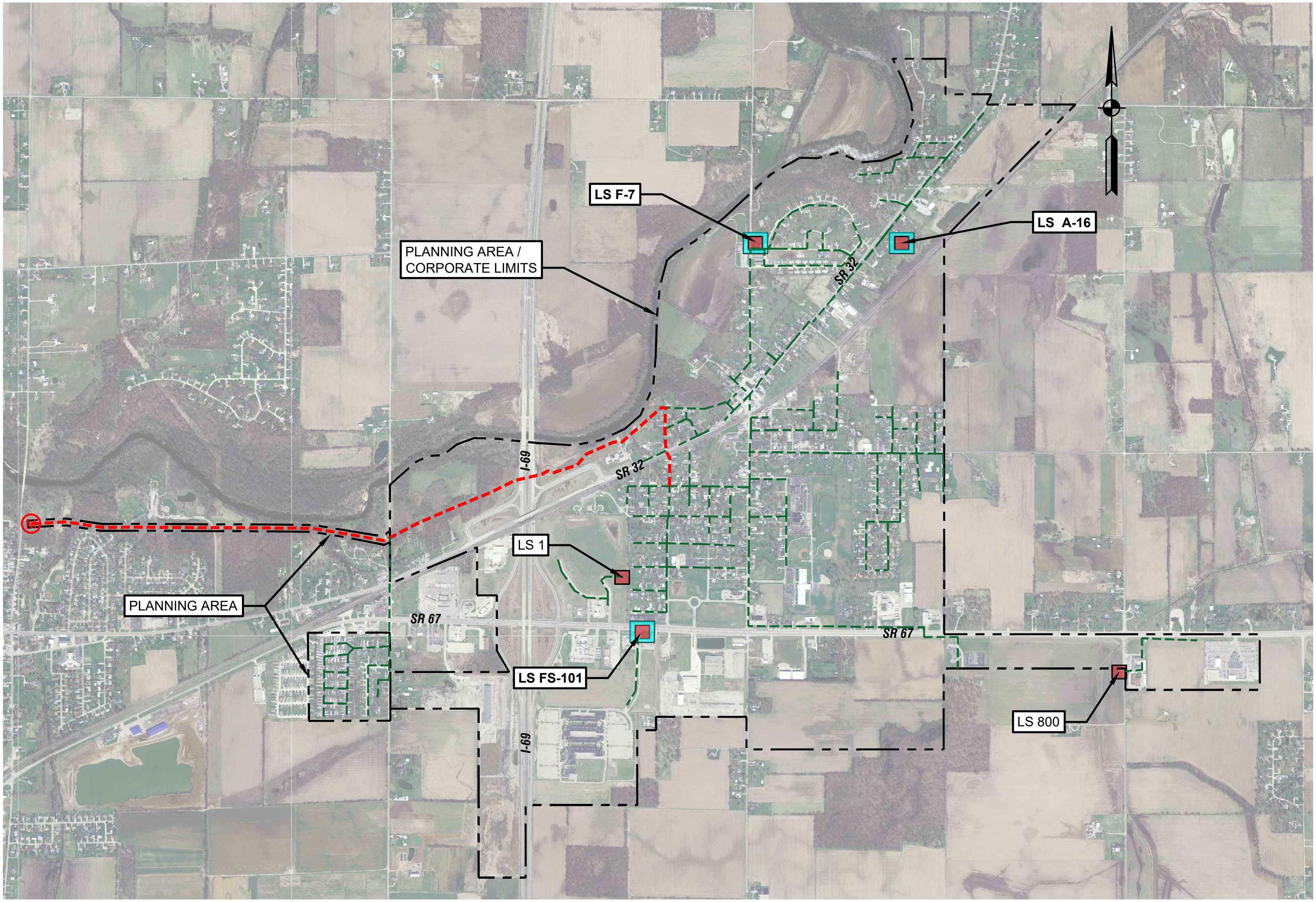
Alternative #3 includes cleaning, televising, and assessing all collection system sewers and manholes. This information will be utilized to prioritize O&M and future improvements work.

The 12-inch interceptor is planned for rehabilitation because it is the highest priority in the collection system and known to be of questionable integrity.

Alternative #3 includes replacing the pumps at three (3) of the five (5) existing system duplex lift stations; LS F-7, LS A-16, and LS FS-101. This replacement would change each pump from a capacity of 60 GPM to 120 GPM. These three (3) lift stations will also be rehabilitated to address any structural and ancillary equipment and material deficiencies.

All five (5) lift stations will receive electrical system upgrades and SCADA replacement. The electrical system upgrades will bring the stations in compliance with Class 1, Division 1 code requirements.

Finally, Alternative #3 will include adding one (1) flow meter to the system. This flow meter will be located at the end of the 12-inch interceptor located



G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 9:06 AM BY: George Roder

LEGEND

— · —	CORPORATE LIMITS / PLANNING AREA
red dashed	SANITARY SEWERS AND MANHOLES TO BE CLEANED AND TELEVISED
green dashed	EXISTING SANITARY SEWERS AND MANHOLES TO BE CLEANED, TELEVISED, AND REHABILITATED
M	PROPOSED FLOW METER
cyan box	PUMP UPGRADE AND REHABILITATION
red box	ELECTRICAL REHABILITATION AND SCADA

SCALE: 1"=2000

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER ALTERNATIVE 3
FIGURE 4-3

in Chesterfield. **Figure 4-3** shows the entire wastewater system that will be cleaned and televised, the portion to be rehabilitated, and the locations of the flow meter and the lift stations to be upgraded.

a. Design Criteria

As mentioned earlier, the current capacity of the pumps is 60 GPM. 60 GPM a through a 4-inch force main produces a velocity of 1.50 fps. Increasing the pump capacity to 120 GPM will create a velocity of 3 fps. Having a higher velocity suspends the solids in the pipe creating less deposits and backups.

The current flow meter is not appropriate for the application. A new flow meter utilizing a Parshall flume with a 6-inch throat will be provided. The range of flows for a flume of this size is 24 GPM to 1,750 GPM. The meter will characterize the total flow Chesterfield receives from Daleville, Laurelwood neighborhood, and Royal Oaks neighborhood.

2. Environmental Impact

With an increase in capacity at three (3) of the lift stations, an IDEM sanitary sewer permit will be required. In addition, LS F-7 is in a floodplain, therefore any proposed changes to the structure of this lift station will consider the floodplain elevation.

Debris collected from the wastewater collection system during cleaning will be appropriately collected and disposed.

3. Land Requirements

No additional land access or acquisition is anticipated.

4. Potential Construction Problems

Minimal construction challenges are anticipated regarding any of the projects within this Alternative. Temporary construction impacts include the potential for noise, dust, and requirements for erosion control, which will be addressed by defining the limitations on construction work within the contract documents during the design phase. All collection system improvements proposed are to existing sewer lines and manholes. The existing wastewater infrastructure currently all lies within road rights-of-way or easements. Therefore, most of the infrastructure should be accessible. Access will require going off roads to address the interceptor to Chesterfield. Since much of the infrastructure is within rights-of-way, access to homes and maintenance of traffic will be required. By-pass pumping may be required for point repairs or sewer rehabilitation during construction. The work associated with these upgrades is expected to be completed during normal working hours, which would restrict work related nuisances to those times. Erosion control measures include drainage inlet protection and offsite sedimentation control. Dust control will be specified in the contract documents and be required to be implemented in accordance with current practices.

5. Cost Estimate

Table 4-7 shows the total capital costs for this alternative, with the construction cost and non-construction cost broken out. The construction cost includes:

- Cleaning, televising, and assessing the entire system.
- Rehabilitation the Interceptor to Chesterfield
- Replacement of an existing flow metering station with a new Parshall flume flow metering station
- Complete rehabilitation of three (3) lift stations; total of six (6) pumps.
- Electrical rehabilitation / compliance work on the remaining two (2) lift stations; keeping the same pumps.
- A new SCADA system.

Table 4-7
Alternative #3 Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$75,500
Erosion Control	$22,700
Traffic Control	$49,000
Bypass Pumping	$120,000
Pump Upgrade and Rehabilitation	$270,000
Electrical Rehabilitation And SCADA	$120,000
Clean and Televise	$416,900
Rehab Manholes and CIPP	$677,500
Point Repair	$60,000
Parshall Flume and Controls	$25,200
Subtotal	**$1,836,800**
Contingency (10%)	$183,700
Total Construction Costs	**$2,020,500**
Estimated Non-Construction Costs	
Non-Construction Costs	$505,800
Total Non-Construction Costs	**$505,800**
Total Capital Costs	**$2,526,300**

6. O&M & SLA Costs

Table 4-8 assumes the cost for treatment remains unchanged. The remaining line items are estimated costs to operate the wastewater collection system on an annual basis.

Table 4-8
Alternative #3 New Annual O&M Costs

Description	Total
Treatment Plant Costs (Paid to Chesterfield)	$234,336[1]
1 Laborer Salary	$40,000
Electrical Costs	$9,000
Supplies, Gas, Etc.	$10,000
Materials, Repairs, Etc.	$50,000
Total Annual O&M	**$343,336**

[1]The cost has been determined by multiplying the number of residential customers ($652) by the residential monthly treatment charge (27.13) by 12- months in a year and by multiplying the number commercial customers (42) by the commercial monthly treatment charge ($42.50) by 12 months in a year.

((652 x $27.13) +($42.50 x 42)) x 12 =$234,336

Table 4-9 shows the short-lived assets for this Alternative. Short-lived assets consist of equipment with a useful life shorter than the planning period.

Table 4-9
Alternative #3 New Annual Short-Lived Assets

Description	Replacement Cost	Useful Life	Total
Lift Station F-7 Pumps and Controls	$50,000	15	$3,333
Lift Station A-16 Pumps and Controls	$50,000	15	$3,333
Lift Station LS-1 Pumps and Controls	$30,000	3	$10,000
Lift Station LS 800 Pumps and Controls	$30,000	5	$6,000
Lift Station FS-101 Pumps and Controls	$50,000	15	$3,333
1 Ultrasonic Flow Meter	$2,500	20	$125
SCADA	$50,000	10	$5,000
Total Short-Lived Assets			**$31,124**

4.2 Wastewater Present Worth Analysis

For each proposed alternative presented, both cost and non-monetary factors are considered for the selection of the proposed project. Factors related to cost are evaluated using a present worth analysis to show the life cycle cost of the project. The cost factors used in the present worth analysis include capital costs, operation/maintenance/replacement (O&M&R) costs, and salvage value. The present worth analysis is discussed in the following subsection, followed by a discussion on non-monetary factors. The remaining two subsections on wastewater project selection cover project phasing and a selection matrix.

A. Present Worth Analysis Method

A present worth analysis takes all of the costs associated with a project over the timeframe considered (20 years) and summarizes them in one overall cost in current dollars. The total present worth of an alternative is determined by summing the initial capital investment cost and the present worth of annual operation, maintenance and equipment replacement costs; and then subtracting the present worth salvage value (if applicable). A factor is calculated for each component cost to allow the costs to be stated in current (present worth) dollars. The factor for capital cost is 1.0 because it assumes capital costs would be expended now. A factor of 18.99 is applied to the annual O&M&R cost over 20 years. Finally, considering a real discount rate of 0.5%, the present worth of the salvage value at the end of 20 years is calculated by multiplying the equipment and material replacement value by a factor of 0.91.

The annual O&M&R costs include additional labor cost, power costs, and equipment costs for components of the project over the 20-year planning period. The salvage value of the constructed project is estimated using the anticipated life expectancy and straight-line depreciation calculated at the end of the planning period and converted to present day dollars. A service life of 50 years is estimated for permanent buildings, sanitary collection system piping, and concrete. **Table 4-10, Table 4-11,** and **Table 4-12** show the calculated salvage value for each alternative.

Table 4-10
Wastewater Alternative #1 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Line and Rehab Lift Station	$107,200	50	$64,320
CIPP	$2,977,300	50	$1,786,380
Line and Rehab Manholes	$825,500	50	$495,300
Lateral Work	$1,784,600	50	$1,070,760
Point Repair	$257,200	50	$154,320
Total			**$3,571,080**

Table 4-11
Wastewater Alternative #2 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Line and Rehab Lift Station	$64,300	50	$38,580
CIPP	$2,977,300	50	$1,786,380
Line and Rehab Manholes	$825,500	50	$495,300
Point Repair	$257,200	50	$154,320
Total			**$2,474,580**

Table 4-12
Wastewater Alternative #3 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Line and Rehab Lift Station	$64,300	50	$38,580
CIPP	$395,300	50	$237,180
Line and Rehab Manholes	$88,800	50	$53,280
Total			**$329,040**

Shown in **Table 4-13** is the present worth analysis of the wastewater alternatives.

Table 4-13
Wastewater Present Worth Analysis

Item	Row	Factor/ Equation	Alternative #1	Alternative #2	Alternative #3
Capital Costs	A	1	$14,110,600	$10,031,100	$2,526,300
Annual O&M&R	B	1	$345,336	$344,336	$343,336
Salvage Value	C	1	$3,571,080	$2,474,580	$329,040
Present Worth of Annual O&M&R	D	18.99*B	$6,557,935	$6,538,945	$6,519,955
Present Worth of Salvage	E	0.91*C	$3,249,683	$2,251,868	$299,426
Total Present Worth	F	A+D-E	$17,097,455	$14,095,465	$8,717,215
Percent Higher			196%	162%	**Least Cost**

B. Non-Monetary Factors

Non-monetary factors include social, environmental, and safety concerns. Social factors include community impact such as appearance and public health. Environmental factors include sustainability, constructability, and the affect to ecologically sensitive areas. Safety factors include the safety of the public and of the operators who would often come into contact with the proposed work.

Table 4-14 shows a matrix to compare the non-monetary factors for each alternative. This matrix assigns numeric values to each factor and for each alternative considered, which helps to rank each alternative. Numbers 1-4 were used to rank alternatives for each factor, 1 being the best option and 4 being the worst option. The factors in the matrix are maintenance safety, community safety, sustainability, constructability, and community impact. For maintenance safety and community safety, the safer the alternative the higher it was ranked. For sustainability, the more sustainable the alternative is, the higher it was ranked. To be ranked first in constructability, the alternative had to be easy to construct with readily available materials. Lastly for the community impact, an alternative received a better rank when it impacted the entire community positively. From this table, Wastewater Alternative #1 received the best ranking for non-monetary factors.

Table 4-14
Wastewater Non-Monetary Factors

Factor	No Action	Alternative #1	Alternative #2	Alternative #3
Maintenance Safety	4	1	2	3
Community Safety	4	1	2	3
Sustainability	4	1	2	3
Constructability	1	3	3	2
Community Impact	4	1	2	3
Total	**17**	**7**	**11**	**14**

C. Project Phasing

Project Phasing does not affect selection; however, phasing is discussed in **Section 6- Selected Plan** to allow Daleville to consider breaking the selected alternative into smaller projects.

D. Selection Matrix

For the selection of an alternative, **Table 4-15** shows a matrix with the following factors: capital costs, O&M costs, non-monetary, I/I problems, and lift station deficiencies. For the selection matrix, a ranking system is again used. Numbers 1-4 ranked each alternative for each factor, 1 being the best option and 4 being the worst option. For the capital costs factor the less expensive the alternative the better the rank. From the present worth analysis described earlier in this section, the results are shown in ranking order (except for No Action which is assumed equal to highest present worth). For the non-monetary factor, the results from **Table 4-15** are also shown in ranking order. The last two (2) rows are ranked on whether the alternative completely or partially solves the I&I problems and the lift station deficiencies.

Table 4-15
Wastewater Selection Matrix

Factor	No Action	Alternative #1	Alternative #2	Alternative #3
Capital Costs	1	4	3	2
Present Worth Analysis	3	3	2	1
Non-Monetary	4	1	2	3
Resolves I&I Problems	4	1	2	3
Resolves Lift Station Deficiencies	4	1	2	3
Total	**16**	**10**	**11**	**12**

Based on the results from **Table 4-15,** it is recommended that Wastewater Alternative #1 be the selected project. Alternative 1 is, however, the most costly of the remedial alternatives. Therefore, the Owner should review financial capability to afford and select accordingly.

4.3 Storm Water

A. Description

As described in **Section 3 – Future Situation** the storm water collection system has deficiencies. Many locations have been identified as flood prone areas throughout the Town. Due to the size and complexity of the baseball field flooding, it is specifically addressed in each alternative of this section. The remainder of the collection system is then evaluated as a group.

Three alternatives to address each of these items plus a no action alternative outlined below. Cost estimates are provided for each alternative.

B. No Action Alternative

1. Description

If no corrective action is taken, then the areas noted will continue to flood. Flooding around the baseball field would adversely impact spectators and players alike potentially preventing the use of the fields for days after rain events. The baseball field flooding also has the potential to negatively impact the railroad. The inadequate storm water collection system could also adversely impact the residents of Daleville by flooding into yards, basements, etc. Flooded areas also have the potential to damage public facilities such as school property and roads.

In addition to property damage, standing water also presents the health risk of water-related vector-borne diseases. Taking no action will result in flooding which will continue to damage public and private property, threaten human health, and potentially harm the environment. This also does not allow for I/I reduction into the wastewater system. Taking a no action approach in regard to Daleville's storm water collection system deficiencies does not resolve the problems which will only increase in frequency and severity over time as existing infrastructure ages.

C. Alternative #1

1. Description

Alternative #1 is the most comprehensive alternative considered for addressing storm water collection system deficiencies in this plan. Alternative #1 addresses the baseball field flooding, adds new pipe to resolve noted flooding in other areas of Town, and replaces undersized pipes where they are not capable of conveying a 10-year, 1-hour storm.

The baseball field improvements will include adding 1,300 feet of storm pipe and catch basins. This also includes bioswales. These will be located near the baseball fields and will connect to the 84-inch diameter pipe which starts on the north side of SR 67, runs under Reserve Street, and then runs east under 3rd Street until it daylights to an unnamed tributary to White

River. This alternative also adds pipe to areas to reduce or eliminate flooding. Proposed pipes will be added along West 6th Street, Elbert Street, John Street, and South Hickory Street. Where possible, hybrid ditches are being added to each of these pipe runs as well. The proposed storm pipes will run the entire length of each road and will be the same size as the pipe in which they discharge. Catch basins/inlets will be provided along these new pipes. Storm pipes will also be added from north terminus of Maple St to north terminus of John St along the edge of the farm field. The storm sewer along John St will tie into the existing storm sewer along Wayne St by adding a storm pipe from John St to Wayne St. This will also include replacement of one block of storm sewer on Wayne Street to increase capacity. Also, this alternative anticipates some dry detention.

The railroad and Tennessee St improvements will include 2,700 feet of storm pipe and catch basins. These will start from the intersection of railroad and Tennessee St and continue north to cross SR 32, and then runs west along south of Heather ln and tie into existing storm sewer along S River Rd. This alignment will include bioswales and/or hybrid ditches as space allows. This improvement is referred to as SR 32 Project.

Further, this project will include replacing deficient pipes noted in **Section 3.** Pipes noted as deficient will be replaced with a larger size diameter to meet the flow requirements of a 10-year, 1-hour storm. **Figure 4-4** shows the proposed improvements for Alternative #1.

a. Design Criteria

Storm sewers will be added near the baseball fields to address flooding in the area. The runoff rate determined using the rational method for the 4.85 acre was 1.58 MGD. A 15-inch pipe at minimum slope can convey 1.63 MGD. The 15-inch pipe will then discharge to the 84-inch which parallels Reserve Street and turns east down 3rd Street.

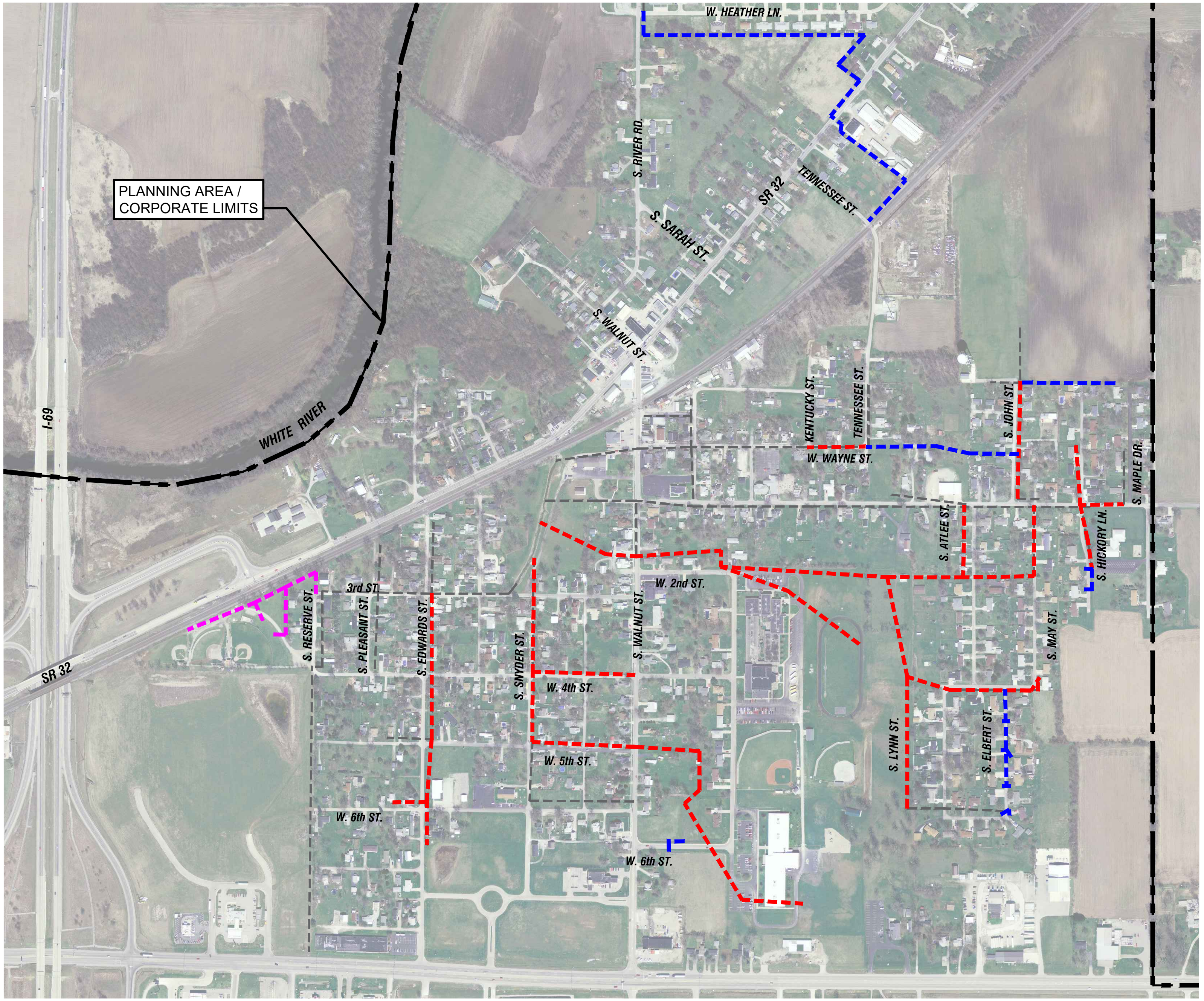
All of the proposed storm sewers added to serve new areas are listed in **Table 4-16**, which shows the street that will receive a new storm sewer and the corresponding pipe diameter.

All of the storm sewers will be added along with hybrid ditches which will reduce I/I and improve storm water collection and drainage in these areas.

Table 4-16
Proposed Additional Storm Sewer Sizes

Street	Existing Discharge Pipe Size	Proposed Pipe Size
West 6th St.	12”	12”
Elbert St.	12”	12”
John St.	12”	12”
South Hickory Ln.	12”	12”

Alternative #1 also proposes replacing hydraulically deficient pipes with sizes large enough to carry a 10-year, 1-hour storm. **Table 4-17** shows the deficient pipes with their existing pipe size and proposed pipe size.



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER ALTERNATIVE #1
FIGURE 4-4

Table 4-17
Alternative #1 Proposed Deficient Pipe Size Changes

From MH	To MH	Pipe ID #	Existing Pipe Diameter (Inches)	Proposed Pipe Diameter (Inches)
4	6	6	12	15
5	6	7	12	15
6	8	8	18	24
8	9	10	24	30
14	13	15	24	30
13	15	16	24	30
16	15	17	15	18
15	17	18	24	30
17	OF*	19	24	30
38	39	20	36	42
39	40	21	36	42
40	41	22	36	42
18	21	24	15	18
22	21	25	18	24
23	22	26	12	15
21	24	27	24	30
25	24	28	24	30
26	25	29	18	24
31	25	30	15	18
32	27	31	12	15
27	26	31a	12	15
28	27	32	18	24
29	28	33	12	15
33	28	34	15	18
35	33	35	12	15
34	33	36a	12	15
50	51	44	15	18
24	37	51	24	30
57	56	54	10	12
56	37	55	12	15
37	38	56	36	42
58	14	57	18	24
59	58	58	18	24
60	59	59	18	24
61	60	60	12	15
62	61	61	12	15

2. Environmental Impact

Alternative #1 will not disturb wetlands nor will it take place in any floodways. Traffic control will be required, and asphalt restoration will also be needed. The need for Rule 5 erosion control and street right-of-way permits will be considered during design and addressed. Work proposed for Alternative #1 will take place in urbanized Daleville and is not expected to negatively impact the environment.

3. Land Requirements

Land access and acquisition is anticipated for this project. At least two (2) easements will be needed for the baseball field project. The intent is to avoid working in railroad right-of-way.

This project will also require easements for the storm sewer east of John Street, the storm sewer between John Street and Wayne Street, and easements along the alignment from Tennessee Street at the railroad up to River Road.

The remaining storm sewer additions are proposed to remain in Daleville right-of-way.

Upsizing existing storm sewers should not require additional land or easements. However, there are a few storm sewers which run outside road rights-of-way. The Town will need to verify existence of easements for these sewers before improvements can be made.

4. Potential Construction Problems

Most of the improvements discussed for Alternative #1 should produce minimal construction challenges. One (1) area which may require additional coordination is when the improvements are made near the baseball fields due to the proximity of the railroad tracks. Every effort will be made to avoid a need to enter onto railroad property. Upsizing the existing storm sewer through the school property may also require sequencing to avoid school events. The proposed storm improvement for Tennessee Street to River Road will require crossing State Road 32.

Temporary construction impacts include the potential for noise, dust, erosion control, and traffic control. Most of the storm sewer lines are within the road rights-of-way; therefore, pavement repair is anticipated. The work associated with these upgrades is expected to be completed during normal working hours, which would restrict work related nuisances to those times. Erosion control measures including seeding, drainage inlet protection, silt fencing, and dust control will also be specified in the contract documents and be required to be implemented in accordance with current practices. Project requirements will also include traffic, drainage, erosion, and dust control plans.

5. Cost Estimate

Table 4-18 shows the total capital costs for this alternative, with the construction cost and non-construction cost broken out.

Table 4-18
Alternative #1 Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$121,200
Erosion Control	$36,400
Traffic Control	$78,000
Baseball Fields and SR 32 Project	$534,000
West 6th St. Storm Project	$6,000
Elbert Street Storm Project	$174,000
John Street Storm Project	$258,000
Hickory Street Storm Project	$38,400
Upsize Deficient Pipes	$1,892,600
Subtotal	**$3,138,600**
Contingency (10%)	$313,900
Total Construction Costs	**$3,452,500**
Estimated Non-Construction Costs	
Non-Construction Costs	$863,200
Total Non-Construction Costs	**$863,200**
Total Capital Costs	**$4,315,700**

6. O&M & SLA Costs

Table 4-19 shows the proposed annual O&M costs for Alternative #1. The existing O&M costs have been derived from expenditures provided by Daleville over the last four (4) years (2013-2016). Expenditures in the first two (2) years (2013-2014) were much higher than in the following two (2) years (2015-2016). The average for all four (4) years is $25,400 per year.

Daleville recently provided the expenditures for 2017. The 2017 expenditures were also low--similar to those in 2015-2016. When 2017 is taken into account, the average actually decreases to $21,300 per year. Since it appears annual costs are more representative for 2015-2017, those are the costs used for existing average O&M. However, since Alternative #1 recommends adding pipe to the system, it is assumed the annual O&M cost will increase. This increase would help operate and maintain additional pipe in the system. See **Table 4-19** below for proposed annual O&M costs. There are no short-lived assets associated with Daleville's storm collection system.

Table 4-19
Storm Water Alternative #1 Proposed Annual O&M Costs

	Total
Existing Average O&M	$7,600
Additional O&M	$2,500
Total Annual O&M	**$10,100**

D. Alternative #2

1. Description

Alternative #2 addresses the baseball field flooding, adds new pipe to resolve noted flooding in other areas of Town, and increases capacity of approximately half of the Town's undersized storm pipes.

The baseball field improvements will include adding 1,200 feet of storm pipe and catch basins. These will be located near the baseball fields and will connect to the 84-inch diameter pipe which starts on the north side of SR 67, runs under Reserve Street, and then runs east under 3rd Street until it daylights to an unnamed tributary to White River. This also includes bioswales. This alternative also adds pipe to areas to reduce or eliminate flooding. Proposed pipes will be added along West 6th Street, Elbert Street, May Street, John Street, and Hickory Street. The proposed storm pipes will run the entire length of each road, will be the same size as the pipe they discharge to, and will have catch basins/inlets every 250 feet. Where possible, hybrid ditches are being added to each of these pipe runs as well. Storm pipes will also be added from north terminus of Maple St to north terminus of John St along the edge of the farm field. The storm sewer along John St will tie into the existing storm sewer along Wayne St by adding a storm pipe from John St to Wayne St. This will also include replacement of one block of storm sewer on Wayne Street to increase capacity. Also, this alternative anticipates some dry detention.

The railroad and Tennessee St improvements will include 2,700 feet of storm pipe and catch basins. These will start from the intersection of railroad and Tennessee St and continue north to cross SR 32, and then runs west along south of Heather ln and tie into existing storm sewer along S River Rd. This alignment will include bioswales and/or hybrid ditches as space allows. This improvement is referred to as SR 32 Project.

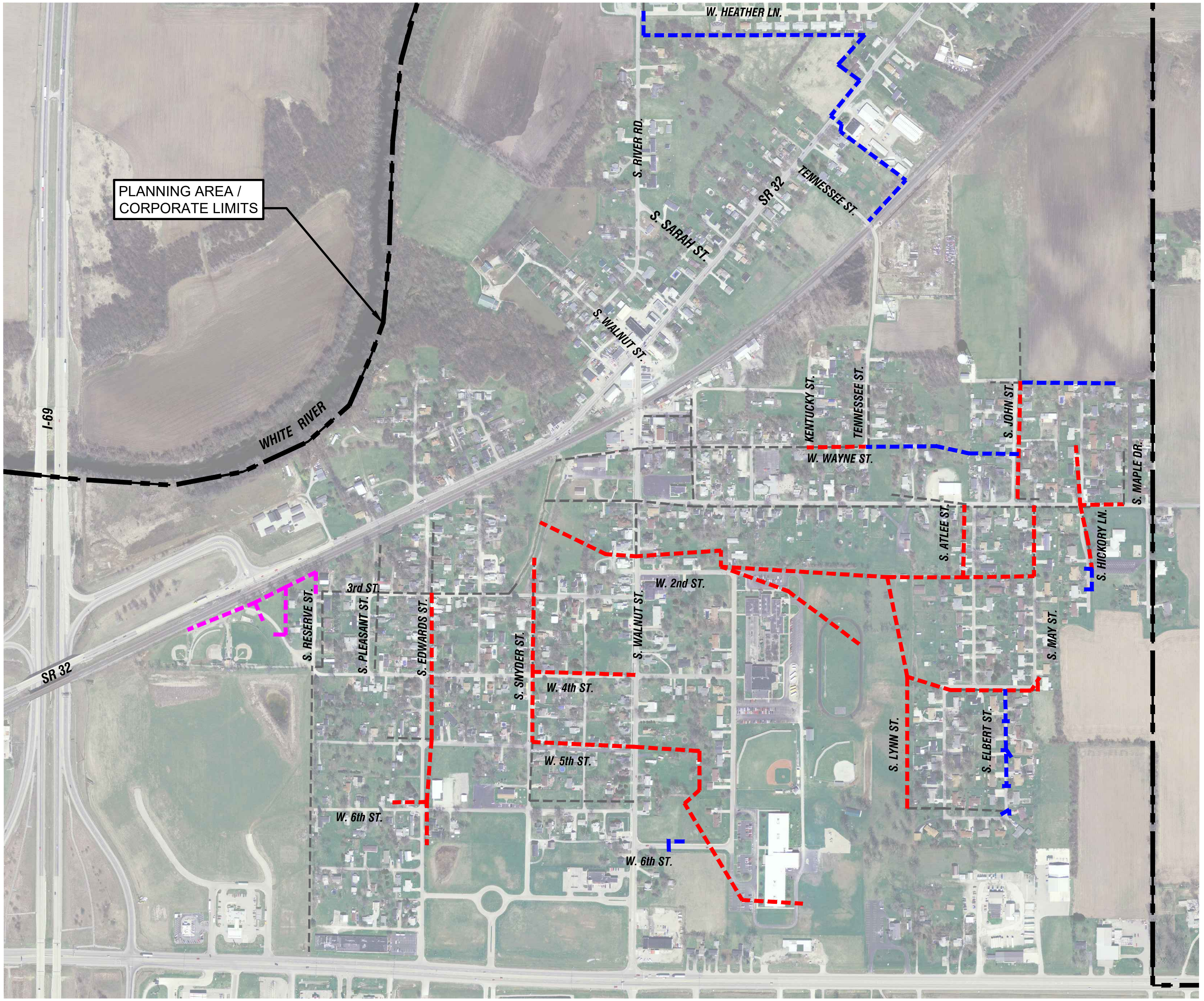
Lastly, this project will include replacing approximately half of the Town's deficient pipes noted in **Section 3.** Those specific pipes noted as deficient will be replaced with a larger size diameter to meet the flow requirements of a 10-year, 1-hour storm. **Figure 4-5** shows the proposed improvements for Alternative #2.

a. Design Criteria

A 15-inch storm sewer will be added near the baseball fields to address flooding in the area. The runoff rate determined using the rational method for the 4.85 acre was 1.58 MGD. A 15-inch pipe at minimum slope can convey 1.63 MGD. The 15-inch pipe will then discharge to the 84-inch which parallels Reserve Street and turns east down 3rd Street.

All of the proposed storm sewers added to serve new areas are listed in **Table 4-16**. It shows the street that will receive a new pipe and the corresponding pipe size.

All of the storm sewers will be added along with hybrid ditches which will reduce I/I and improve storm water collection and drainage in these areas.



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER ALTERNATIVE #2
FIGURE 4-5

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader

Alternative #2 also proposes replacing hydraulically deficient pipes which are 18 inches in diameter or larger with sizes large enough to carry a 10-year, 1-hour storm. These represent slightly over half of the Town's deficient storm pipes. The intent of Alternative #2 is to recognize all of the storm sewer deficiencies may not be able to be addressed. In order to effectively address hydraulic deficiencies, downstream deficiencies need to be addressed first. **Table 4-20** shows the deficient pipes with their existing pipe size and proposed pipe size.

Table 4-20
Alternative #2 Proposed Deficient Pipe Size Changes

From MH	To MH	Pipe ID #	Existing Pipe Diameter (Inches)	Proposed Pipe Diameter (Inches)
6	8	8	18	24
8	9	10	24	30
14	13	15	24	30
13	15	16	24	30
15	17	18	24	30
17	OF*	19	24	30
38	39	20	36	42
39	40	21	36	42
40	41	22	36	42
22	21	25	18	24
21	24	27	24	30
25	24	28	24	30
26	25	29	18	24
28	27	32	18	24
24	37	51	24	30
37	38	56	36	42
58	14	57	18	24
59	58	58	18	24
60	59	59	18	24

2. Environmental Impact

Alternative #2 will not disturb wetlands nor will it take place in any floodways. Traffic control will be required, and asphalt restoration will also be needed. The need for Rule 5 erosion control and street right-of-way permits will be considered during design and addressed as needed. Any work proposed for Alternative #2 will take place in urbanized Daleville and is not expected to negatively impact the environment.

3. Land Requirements

Land access and acquisition is anticipated for this project. At least two (2) easements will be needed for the baseball field project. The intent is to avoid working in railroad right-of-way. This project will also require easements for the storm sewer east of John Street, the storm sewer between John Street and Wayne Street, and easements along the alignment from Tennessee Street at the railroad up to River Road.

The remaining storm sewer additions are proposed to remain in Daleville right-of-way.

All of the storm sewer additions are proposed to remain in Daleville right-of-way. Upsizing existing storm sewers should not require additional land or easements. However, there are a few storm sewers which run outside road rights-of-way. The Town will need to verify their existing easements for these sewers before changes can be made.

4. Potential Construction Problems

Most of the improvements discussed for Alternative #2 should produce minimal construction challenges. One area which may require additional coordination is when the improvements are made near the baseball fields due to the proximity of the railroad tracks. Every effort will be made to avoid a need to enter onto railroad property. The proposed storm improvement for Tennessee Street to River Road will require crossing State Road 32.

Minimal construction challenges are anticipated regarding any of the alternatives outlined in this section. Temporary construction impacts include the potential for noise, dust, erosion control, and traffic control. Most of the storm sewer lines are within the road rights-of-way; therefore, pavement repair is anticipated. The work associated with these upgrades is expected to be completed during normal working hours, which would restrict work related nuisances to those times. Erosion control measures including seeding, drainage inlet protection, silt fencing, and dust control will also be specified in the contract documents and be required to be implemented in accordance with current practices. Project requirements will also include traffic, drainage, erosion, and dust control plans.

5. Cost Estimate

Table 4-21 shows the total capital costs for this alternative, with the construction cost and non-construction cost broken out.

Table 4-21
Alternative #2 Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$78,900
Erosion Control	$23,700
Traffic Control	$51,000
Baseball Fields and SR 32 Project	$534,000
West 6th St. Storm Project	$6,000
Elbert Street Storm Project	$174,000
John Street Storm Project	$258,000
Hickory Street Storm Project	$38,400
Deficient Pipes	$1,047,000
Subtotal	**$2,211,000**
Contingency (10%)	$221,100
Total Construction Costs	**$2,432,100**
Estimated Non-Construction Costs	
Non-Construction Costs	$608,100
Total Non-Construction Costs	**$608,100**
Total Capital Costs	**$3,040,200**

6. O&M & SLA Costs

Table 4-22 shows the proposed annual O&M costs for Alternative #2. These are anticipated to be the same as Alternative #1.

Table 4-22
Storm Water Alternative #2

Proposed Annual O&M Costs	Total
Existing Average O&M	$7,600
Additional O&M	$2,500
Total Annual O&M	**$10,100**

There are no short-lived assets associated with Daleville's storm collection system.

E. Alternative #3

1. Description

Alternative #3 addresses the baseball field flooding and adds new pipe to resolve noted flooding in other areas of Town. Alternative #3 does not include replacing any pipe to increase hydraulic capacity.

The baseball field improvements will include adding 1,300 feet of storm pipe and catch basins. These will be located near the baseball fields and will connect to the 84-inch diameter pipe which starts on the north side of SR 67, runs under Reserve Street, and then runs east under 3rd Street until it daylights to an unnamed tributary to White River. This also includes bioswales. This alternative also adds pipe to areas to reduce or eliminate flooding. Proposed pipes will be added along West 6th Street, Elbert Street, John Street, and South Hickory Street. Storm pipes will also be added from north terminus of Maple St to north terminus of John St along the edge of the farm field. The storm sewer along John St will tie into the existing storm sewer along Wayne St by adding a storm pipe from John St to Wayne St. This will also include replacement of one block of storm sewer on Wayne Street to increase capacity. Also, this alternative anticipates some dry detention. The proposed storm pipes will have catch basins/inlets along the pipes. **Figure 4-6** shows the proposed improvements for Alternative #3.

The railroad and Tennessee St improvements will include 2,700 feet of storm pipe and catch basins. These will start from the intersection of railroad and Tennessee St and continue north to cross SR 32, and then runs west along south of Heather ln and tie into existing storm sewer along S River Rd. This alignment will include bioswales and/or hybrid ditches as space allows. This improvement is referred to as SR 32 Project.

a. Design Criteria

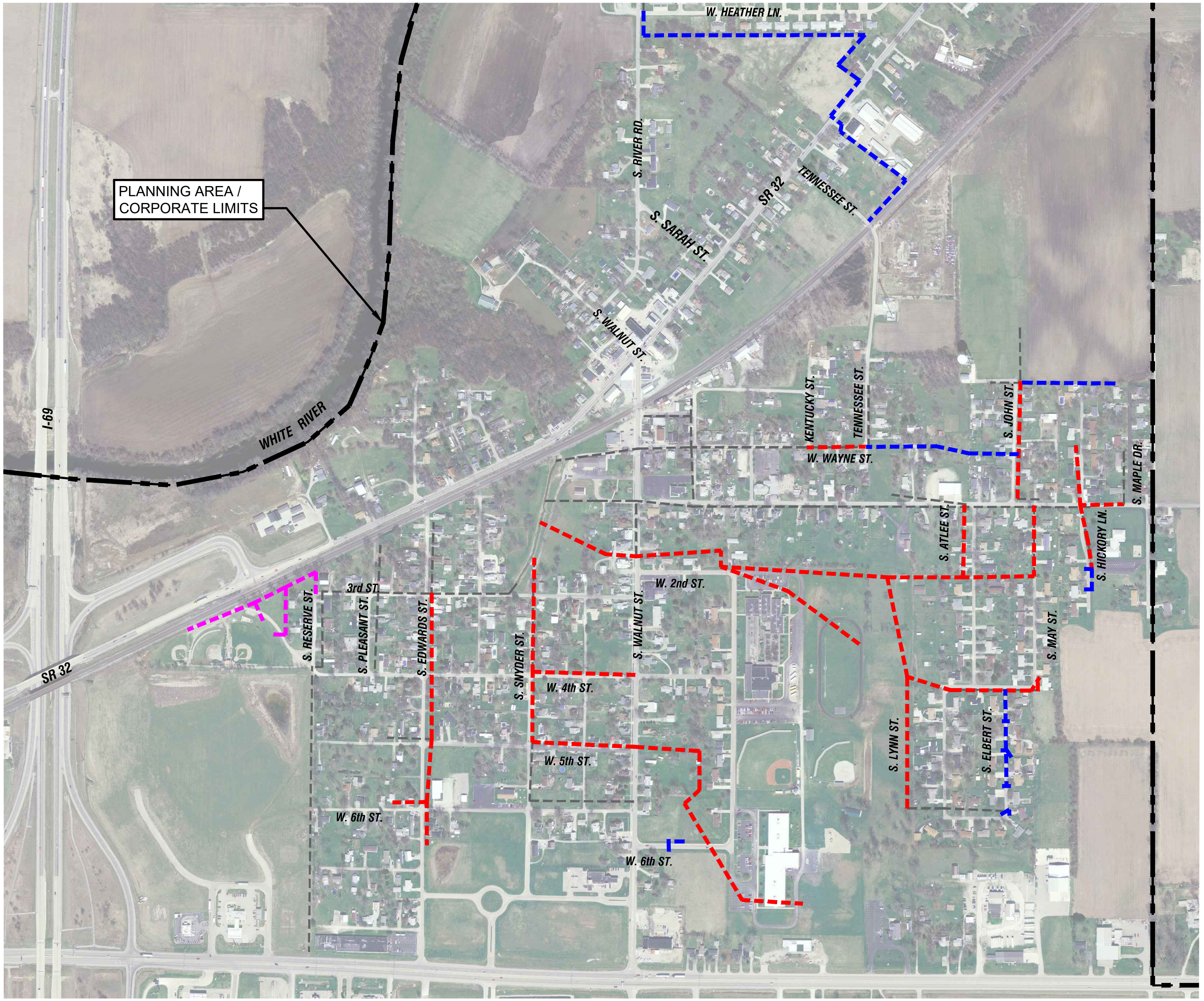
Storm sewers will be added near the baseball fields to address flooding in the area. The runoff rate determined using the rational method for the 4.85 acre was 1.58 MGD. A 15-inch pipe at minimum slope can convey 1.63 MGD. The 15-inch pipe will then discharge to the 84-inch which parallels Reserve Street and turns east down 3rd Street.

All of the proposed storm sewers added to serve new areas are listed in **Table 4-16**. It shows the street that will receive a new pipe and the corresponding pipe size.

All of the storm sewers will be added along with hybrid underdrain ditch which will improve storm water collection and drainage in these areas.

2. Environmental Impact

Alternative #3 will not disturb wetlands nor will it take place in any floodways. Traffic control will be required, and asphalt restoration will also be needed. The need for Rule 5 erosion control and street right-of-way permits will be considered during design and addressed as needed. Any work proposed for Alternative #3 will take place in urbanized Daleville and is not expected to negatively impact the environment.



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER ALTERNATIVE #3
FIGURE 4-6

3. Land Requirements

Land access and acquisition is anticipated for this project. At least two (2) easements will be needed for the baseball field project. The intent is to avoid working in railroad right-of-way. This project will also require easements for the storm sewer east of John Street, the storm sewer between John Street and Wayne Street, and easements along the alignment from Tennessee Street at the railroad up to River Road.

The remaining storm sewer additions are proposed to remain in Daleville right-of-way.

All of the storm sewer additions are proposed to remain in Daleville right-of-way.

4. Potential Construction Problems

Most of the improvements discussed for Alternative #3 should produce minimal construction challenges. One area which may require additional coordination is when the improvements are made near the baseball fields due to the proximity of the railroad tracks. Every effort will be made to avoid a need to enter onto railroad property. The proposed storm improvement for Tennessee Street to River Road will require crossing State Road 32.

Minimal construction challenges are anticipated regarding any of the alternatives outlined in this section. Temporary construction impacts include the potential for noise, dust, erosion control, and traffic control. Most of the storm sewer lines are within the road rights-of-way; therefore, pavement repair is anticipated. The work associated with these upgrades is expected to be completed during normal working hours, which would restrict work related nuisances to those times. Erosion control measures including seeding, drainage inlet protection, silt fencing, and dust control will also be specified in the contract documents and be required to be implemented in accordance with current practices. Project requirements will also include traffic, drainage, erosion, and dust control plans.

5. Cost Estimate

Table 4-23 shows the total capital costs for this alternative, with the construction cost and non-construction cost broken out.

Table 4-23
Storm Water Alternative #3
Estimated Capital Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$45,000
Erosion Control	$27,000
Traffic Control	$9,000
Baseball Fields and SR 32 Project	$534,000
West 6th St. Storm Project	$6,000
Elbert Street Storm Project	$174,000
John Street Storm Project	$258,000
Hickory Street Storm Project	$38,400
Subtotal	**$1,091,400**
Contingency (10%)	$109,200
Total Construction Costs	**$1,200,600**
Estimated Non-Construction Costs	
Non-Construction Costs	$310,200
Total Non-Construction Costs	**$310,200**
Total Capital Costs	**$1,510,800**

6. O&M & SLA Costs

Table 4-24 shows the proposed annual O&M costs for Alternative #3. These are anticipated to be the same as Alternative #1.

Table 4-24
Storm Water Alternative #3

Proposed Annual O&M Costs	Total
Existing Average O&M	$7,600
Additional O&M	$2,500
Total Annual O&M	**$10,100**

There are no short-lived assets associated with Daleville's storm collection system.

4.4 Storm Water Present Worth Analysis

For each proposed alternative presented in Section 4, both cost and non-monetary factors are considered for the selection of the proposed project. Factors related to cost are evaluated using a present worth analysis to show the life cycle cost of the project. The cost factors used in the present worth analysis include capital costs, O&M&R costs, and salvage value. The present worth analysis is discussed in the following subsection. That is followed by a discussion on non-monetary factors. The remaining two subsections on wastewater project selection cover project phasing and a selection matrix.

A. Present Worth Analysis Method

A present worth analysis takes all of the costs associated with a project over the timeframe considered (20 years) and summarizes them in one overall cost in current dollars. The total present worth of an alternative is determined by summing the initial capital investment cost and the present worth of annual operation, maintenance and equipment replacement costs; and then subtracting the present worth salvage value (if applicable). A factor is calculated for each component cost to allow the costs to be stated in current (present worth) dollars. The factor for capital cost is 1.0 because it assumes capital costs would be expended now. A factor of 18.99 is applied to the annual O&M&R cost over 20 years. Finally, considering a real discount rate of 0.5%, the present worth of the salvage value at the end of 20 years is calculated by multiplying the equipment and material replacement value by a factor of 0.91.

The annual O&M&R costs include additional labor cost, power costs, and equipment costs for components of the project over the 20-year planning period. The additional O&M&R costs are shown in **Section 4 – Evaluation of Alternatives.** The salvage value of the constructed project is estimated using the anticipated life expectancy and straight-line depreciation calculated at the end of the planning period and converted to present day dollars. A service life of 75 years is estimated for storm piping and 50 years for concrete. **Table 4-25, Table 4-26,** and **Table 4-27,** show the salvage value for each alternative.

Table 4-25
Storm Water Alternative #1 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Storm Pipe	$342,900	75	$251,460
Catch Basin	$38,600	50	$23,160
West 6th	$1,800	75	$1,320
Catch Basin	$2,600	50	$1,560
Elbert Street	$85,800	75	$62,920
Catch Basin	$38,600	50	$23,160
John Street	$171,500	75	$125,767
Catch Basin	$12,900	50	$7,740
Hickory Street	$17,200	75	$12,613
Catch Basin	$10,300	50	$6,180
New 12"	$42,900	75	$31,460
New 15"	$359,800	75	$263,853
New 18"	$178,300	75	$130,753
New 24"	$270,000	75	$198,000
New 42"	$144,000	75	$105,600
Total			**$1,245,547**

Table 4-26
Storm Water Alternative #2 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Storm Pipe	$342,900	75	$251,460
Catch Basin	$38,600	50	$23,160
West 6th	$1,800	75	$1,320
Catch Basin	$2,600	50	$1,560
Elbert Street	$85,800	75	$62,920
Catch Basin	$38,600	50	$23,160
John Street	$171,500	75	$125,767
Catch Basin	$12,900	50	$7,740
Hickory Street	$17,200	75	$12,613
Catch Basin	$10,300	50	$6,180
New 24"	$0	75	$0
New 30"	$0	75	$0
New 42"	$0	75	$0
Total			**$1,064,413**

Table 4-27
Storm Water Alternative #3 Salvage Value

Description	Cost	Life Expectancy	Salvage After 20 Years
Storm Pipe	$342,900	75	$251,460
Catch Basin	$38,600	50	$23,160
West 6th	$1,800	75	$1,320
Catch Basin	$2,600	50	$1,560
Elbert Street	$85,800	75	$62,920
Catch Basin	$38,600	50	$23,160
John Street	$171,500	75	$125,767
Catch Basin	$12,900	50	$7,740
Hickory Street	$17,200	75	$12,613
Catch Basin	$10,300	50	$6,180
Total			**$515,880**

Shown in **Table 4-28** is the present worth analysis of the storm water alternatives.

Table 4-28
Storm Water Present Worth Analysis

Item	Row	Factor/ Equation	Alternative #1	Alternative #2	Alternative #3
Capital Costs	A	1	$4,315,700	$3,040,200	$1,510,800
Annual O&M&R	B	1	$10,100	$10,100	$10,100
Salvage Value	C	1	$1,245,547	$1,064,413	$515,880
Present Worth of Annual O&M&R	D	18.99*B	$191,799	$191,799	$191,799
Present Worth of Salvage	E	0.91*C	$1,133,447	$968,616	$469,451
Total Present Worth	F	A+D-E	$3,261,952	$2,167,586	$1,186,719
Percent Higher			275%	183%	Least Cost

B. Non-Monetary Factors

Non-monetary factors include social, environmental and safety concerns. Social factors include community impact such as appearance, and public health. Environmental factors include sustainability, constructability, and the affect to ecologically sensitive areas. Safety factors include the safety of the public and of the operators who would often come into contact with the proposed work.

Table 4-29 shows a matrix to compare the non-monetary factors for each alternative. This matrix assigns numeric values to each factor and for each alternative considered, which helps to rank each alternative. Numbers 1-4 were used to rank each alternative for each factor, 1 being the best option and 4 being the worst option. The factors in the matrix are maintenance safety, community safety, sustainability, constructability, and community impact. For maintenance safety and community safety, the safer the alternative the higher it was ranked. For sustainability factor, the more sustainable the alternative is, the higher it was ranked. To be ranked first in constructability, the alternative had to have an easy construction plan. Lastly for the community impact, an alternative received a better rank when it impacted the entire community positively. From this table, Storm water Alternative #1 received the best ranking for non-monetary factors.

Table 4-29
Storm Water Non-Monetary Factors

Factor	No Action	Alternative #1	Alternative #2	Alternative #3
Maintenance Safety	3	1	2	3
Community Safety	3	1	2	3
Sustainability	4	1	2	3
Constructability	1	3	3	2
Community Impact	4	1	2	3
Total	**15**	**7**	**11**	**14**

C. Project Phasing

Project Phasing does not affect selection; however, phasing is discussed in **Section 6- Selected Plan** to allow Daleville to consider breaking the selected alternative into smaller projects.

D. Selection Matrix

For the selection of an alternative, **Table 4-30** shows a matrix with the following factors: capital costs, O&M costs, non-monetary, I/I problems, and lift station deficiencies. For the selection matrix, a ranking system is again used. Numbers 1-4 ranked each alternative for each factor, 1 being the best option and 4 being the worst option. For the capital costs factor the less expensive the alternative the better the rank. From the present worth analysis described earlier in this section, the results are shown in ranking order (except for No Action which is assumed equal to highest present worth). For the non-monetary factor, the results from **Table 4-29** are also shown in ranking order. The last two rows are ranked on whether the alternative completely or partially solves the flooding and pipe capacity problems.

Table 4-30
Storm Water Selection Matrix

Factor	No Action	Alternative #1	Alternative #2	Alternative #3
Capital Costs	1	4	3	2
Present Worth Analysis	3	3	2	1
Non-Monetary Factors	4	1	2	3
Resolves Flooding	4	1	2	2
Resolves Capacity Deficiencies	4	1	2	4
Total	**16**	**10**	**11**	**12**

Based on the results from **Table 4-30,** it is recommended that Storm Water Alternative #1 be the selected project. Again, however, Alternative #1 is the costliest. The Owner should review financial capability to afford and select the accordingly.

SECTION 5 - EVALUATION OF ENVIRONMENTAL IMPACTS

5.1 Land Use

The project location is within the corporate limits of the Town of Daleville.

5.2 Disturbed/Undisturbed

The improvements proposed will be constructed on previously disturbed land. Borrow soil is not anticipated to be required for construction. Granular backfill will be from a commercial source.

The main soil types found within the project area are Treaty silty clay loam (15.4%), Wawaka silt loam (15.0%), and Crosby silt loam (14.9%), as shown in **Figures 5-1A, 5-1B, and 5-1C**, which were taken from USDA's Natural Resources Conservation Services (NRCS) Web Soil Survey website. Detailed descriptions of the soil types shown can be found in the online soil survey. The only difference between **Figures 5-1A and 5-1B** is the planned improvements have been added to **Figure 5-1B**.

Construction projects are not expected to have any detrimental, long term impacts on the soils. Short term impact will relate to excavation activities for the installation of the collection system improvements. These impacts can be easily mitigated through the use of appropriate techniques for erosion control and surface restoration during and following construction.

5.3 Historic, Architectural, and Archaeological Resources

The Delaware County Interim Report (1985) was reviewed to identify historical sites within the planning area. The Town of Daleville includes buildings from the late nineteenth to early twentieth century. There are several sites within the proposed project area with notable significance. All construction will halt immediately in the event of a historical discovery or the unearthing of artifacts. **Figures 5-2 and 5-2A** show the location of historical sites in relation to the project area.

Table 5-1
Historical & Architecturally Significant Sites

Survey Number	Historic Name	Rating
001	House	Contributing
002	House	Contributing
003	Daleville Christian Church	Contributing
004	House	Contributing
005	House	Contributing
006	Fetrow House	Contributing
007	House	Contributing
008	Cranor House	Notable
009	House	Contributing
010	Schlegel House	Notable

Delaware County Interim Report

5.4 Wetlands

The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency define wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturate soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands areas are particularly important due to their ability to sustain a vast array of plant and animal life that depend solely on the hydrologic and physiographic conditions. Because of this, wetlands have higher potential to support certain endangered species habitat.

The IndianaMap and the U.S. Fish & Wildlife Nation Wetlands Inventory online maps were examined to identify wetlands areas located within the project area that may be affected by the proposed project. **Figures 5-3 and 5-3A** show wetlands near the project area. Wetlands are not anticipated to be affected by the construction or operation of the project.

5.5 Hydrology

A. Drainage Basins

The drainage basin the treatment plant discharges into is of critical importance in planning. The U.S. Geological Survey (USGS) and National Resources Conservation Service (NRCS) have developed fourteen-digit codes to identify drainage basins. The Town and the treatment plant are both located in the drainage basin (05120201030020) White River-Shoemaker Ditch.

B. Surface Waters

The treatment plant discharges to the White River. The White River West Fork is not listed as Limited Use and Outstanding State Resource Waters (327 IAC 2-1.5-

19), Exceptional Use Stream (327 IAC 2-1-11), Natural, Scenic, and Recreational River or Stream (312 IAC 7-2), or Salmonid Stream (327 IAC 2-1.5-5).

C. 100-Year Flood Plains and Floodways

In areas where detailed flood analysis has been performed, base flood elevations have been computed at cross sections of the river or stream. It is important that no fill or structures be placed within the 100-year floodway. The floodway is that portion of a river or watercourse and the adjacent areas that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation. Adding structures, fill, or other encroachments to a floodway can significantly increase the upstream headwater elevations, in turn increasing the potential for damage.

The areas of potential effect for this project are not within the floodplain identified by **Figures 5-4 and 5-4A**. These figures were created from IndianaMap website, which builds its floodplain mapping from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM).

D. Groundwater

The USDA-NRCS publishes measured depth to water table data for the project area. The majority of the project area is found to have a water table between 0 and 38 centimeters deep. Consequently, sections of the project may be affected by high groundwater. See **Figures 5-5A, 5-5B, and 5-5C**

If dewatering is required to complete construction, dewatering flows will be discharged to a settling basin prior to being discharged to surface water. The amount of dewatering is anticipated to be minimal. Therefore, dewatering is not expected to cause long term detriment to the groundwater table of local wells.

No sole sourced aquifers will be affected by the proposed project.

5.6 Plant and Animals

The Indiana Department of Natural Resources web site and the U.S. Fish & Wildlife Service Information for Planning and Conservation (IPaC) report for the project were reviewed to identify endangered, threatened and rare species within the project area. Included in the list of endangered species is the Indiana Bat (*Myotis sodalist*). In the threatened species list is the Northern Long-eared Bat (*Myotis septentrionalis*).

All construction activity performed as a result of recommendations of this PER will be completed on property presently owned by the Town, on easements, or on property purchased by the Town. The project will be implemented to minimize impact to non-endangered species and their habitat.

5.7 Prime Farmland and Geology

Prime Agricultural Land or Farmland is a designation assigned by the U.S. Department of Agriculture (USDA).This includes land that exhibits the best combination of physical and chemical characteristics for the cultivation of food crops, feed, forage and fiber, and which is also readily available for these uses.

Prime farmland has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from regional precipitation, a favorable temperature and growing season, acceptable acidity and sodium content, and few or no rock outcroppings. They are permeable to water and air. Prime farmlands are not excessively susceptible to erosion or saturation for long periods of time, and they either do not flood frequently or are protected from flooding.

Prime farmland also tends to be well suited to residential and commercial development, and is therefore prone to conversion when in proximity to urban growth areas. The USDA "Prime Farmland" designation serves to promote growth management and resource conservation efforts in urban areas.

The majority of the planning area is in the "not prime farmland" category. However, the planning area includes "prime farmland if drained". For reference, please see **Figures 5-6A, 5-6B, and 5-6C**.

5.8 Air Quality

Air quality impacts from the proposed project for conformance with applicable rules under Title 326 Articles 1, 2, 6, 7, and 8 of the Federal 1990 Clean Air Act Amendments.

A. Construction Activity

To minimize non-conformance with 326 IAC 6-4, "Fugitive Dust Emissions", reasonable and proper construction techniques and clean up practices will be provided. In addition, surface wetting practices will be utilized to control dust emissions where required. Please note that 326 IAC 6-4-6(3) provides for an exemption to the rule "…from construction or demolition activity where every reasonable precaution has been taken in minimizing fugitive dust emissions". Exhausts of construction equipment will be required to have mufflers for noise and air pollution abatement.

B. Clean Air Act Title III – Hazardous Air Pollutants

Title III calls for a program to prevent the accidental releases of hazardous air pollutants from facilities. We do not anticipate use of chemicals in the WWTP project that may release hazardous air pollutants as defined by EPA's Hazardous Air Pollutant Listing. If potential hazardous air pollutants are used on the Wastewater Treatment Plant Improvements Project, we will require monitoring, record keeping, reporting, and vapor recovery, secondary containment, design, equipment, work practices and operation according to Federal Standards.

5.9 Open Space and Recreational Opportunities

The proposed project's construction and operation will neither create not destroy open space and recreational opportunities.

5.10 Lake Michigan Costal Program

The proposed project will not affect the Lake Michigan Costal Zone.

5.11 National Natural Landmarks

The construction and operation of the proposed project will not affect National Natural Landmarks.

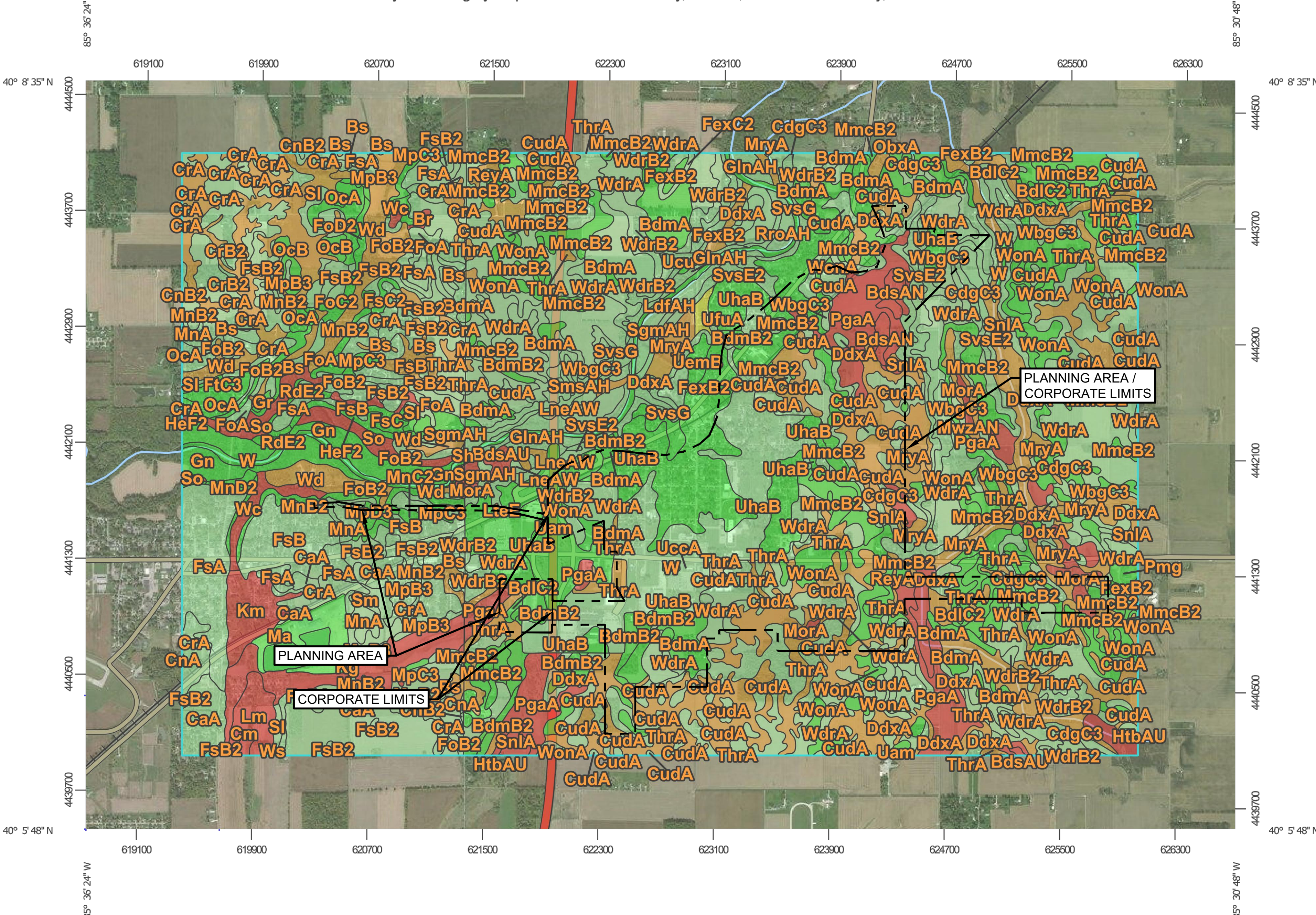
5.12 Secondary Impacts

The Town of Daleville, through the authority of its council, planning commission or other means will ensure that future development, as well as future wastewater and storm water infrastructure projects connecting to SRF-funded facilities, will not adversely impact wetlands, wooded areas, steep slopes, archaeological/historical/structural resources, or other sensitive environmental resources. The Town of Daleville will require new development and treatment works projects to be constructed within the guidelines of the U.S. Fish and Wildlife Service, IDNR, IDEM, and other environmental review authorities.

5.13 Mitigation Measures

The majority of the environmental impacts will occur during construction of the proposed improvements. These issues will be temporary in nature, since no significant impacts to environmental, historical, or other regulated resources are involved. These temporary construction impacts include the potential for noise, dust, and construction site erosion. Provisions will be included in the construction specifications to limit such problems and to provide erosion control in accordance with current state standards. The work is expected to be completed during normal working hours, restricting any work-related nuisances to those hours. All construction equipment will be required to have mufflers to reduce noise pollution. Additionally, reasonable and proper construction techniques and clean up practices will be required by the contractor to reduce dust emissions. Proper surface wetting practices will be required. Erosion control measures including seeding, drainage inlet protection, and silt fencing will also be utilized.

Hydric Rating by Map Unit—Delaware County, Indiana, and Madison County, Indiana



SCALE: 1"=3,000'

3,000' 0 3,000'

COMMONWEALTH ENGINEERS, INC.

A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

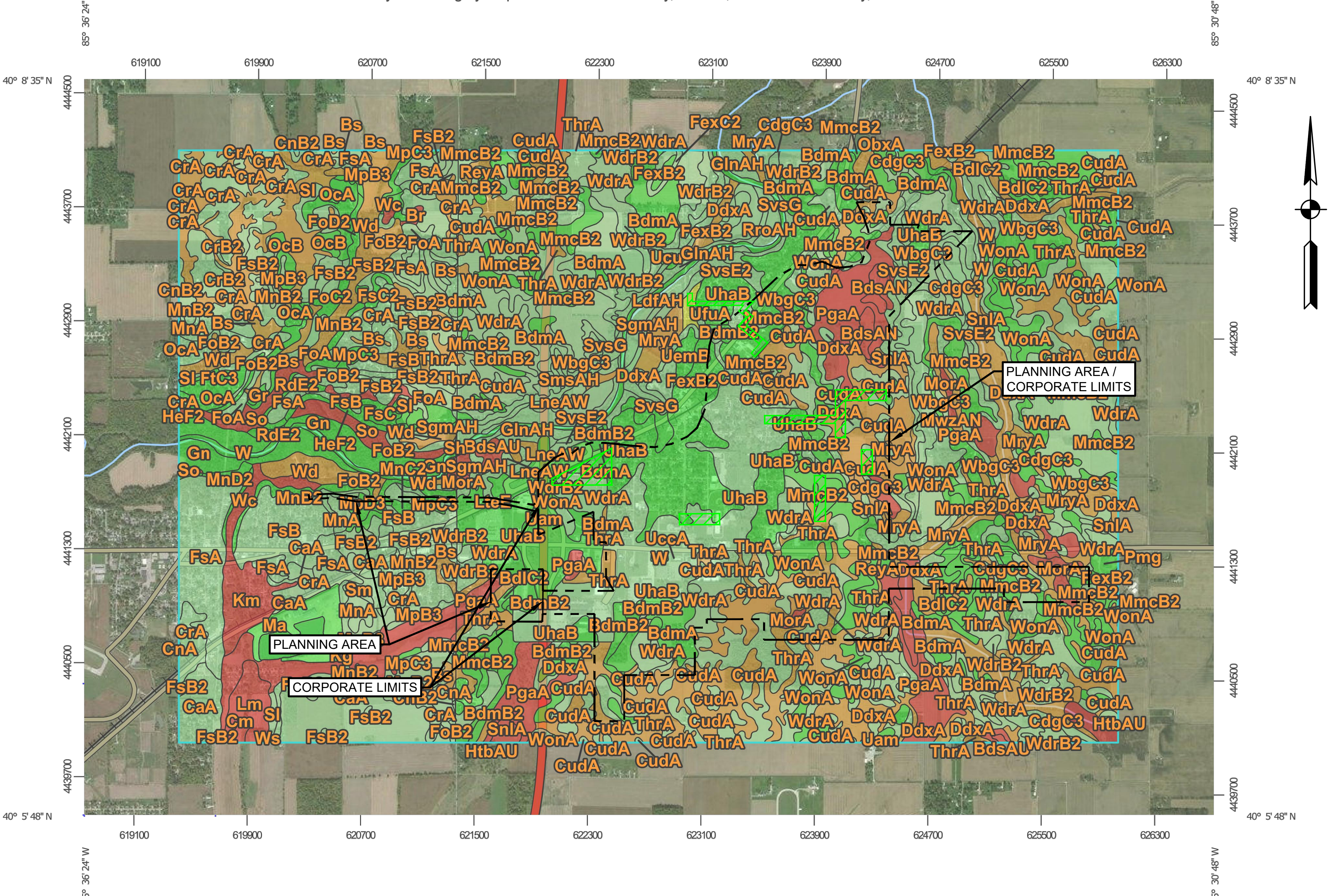
WASTEWATER AND STORMWATER UTILITY MASTER PLAN

HYDRIC RATING MAP
FIGURE 5-1A

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:04 AM BY: George Rader

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:04 AM BY: George Rader

Hydric Rating by Map Unit—Delaware County, Indiana, and Madison County, Indiana



LEGEND

STORM WATER IMPROVEMENTS AREAS

SCALE: 1"=3,000'

3,000' 0 3,000'

COMMONWEALTH ENGINEERS, INC.

A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

HYDRIC RATING MAP
FIGURE 5-1B

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Delaware County, Indiana
Survey Area Data: Version 21, Oct 2, 2017

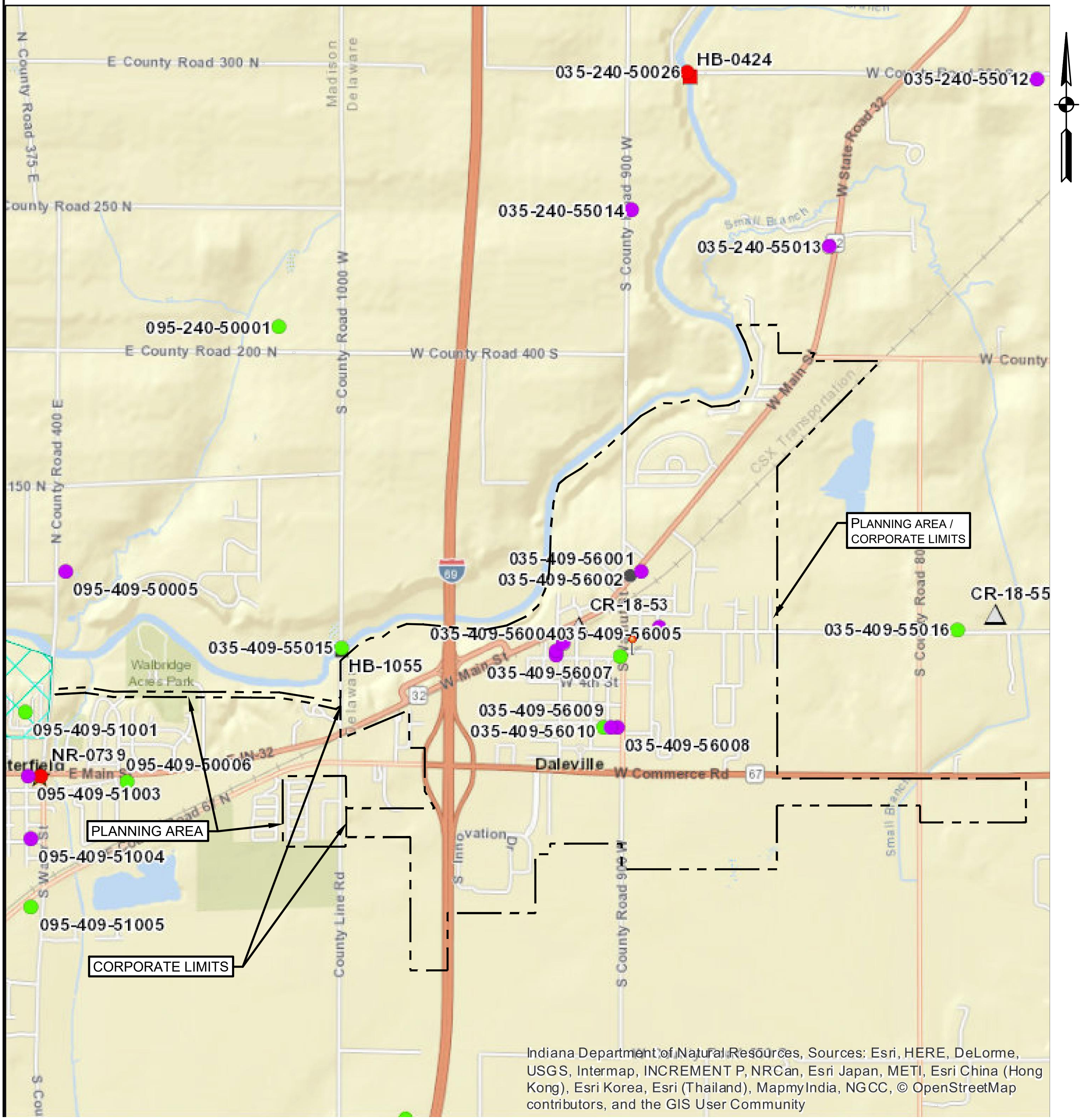
Soil Survey Area: Madison County, Indiana
Survey Area Data: Version 20, Oct 2, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 1, 2011—Apr 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:04 AM BY: George Rader

Addresses
Cemeteries
Outstanding
Notable
Contributing
Non-Contributing
Demolished
Unknown

SCALE: 1"=3,500'

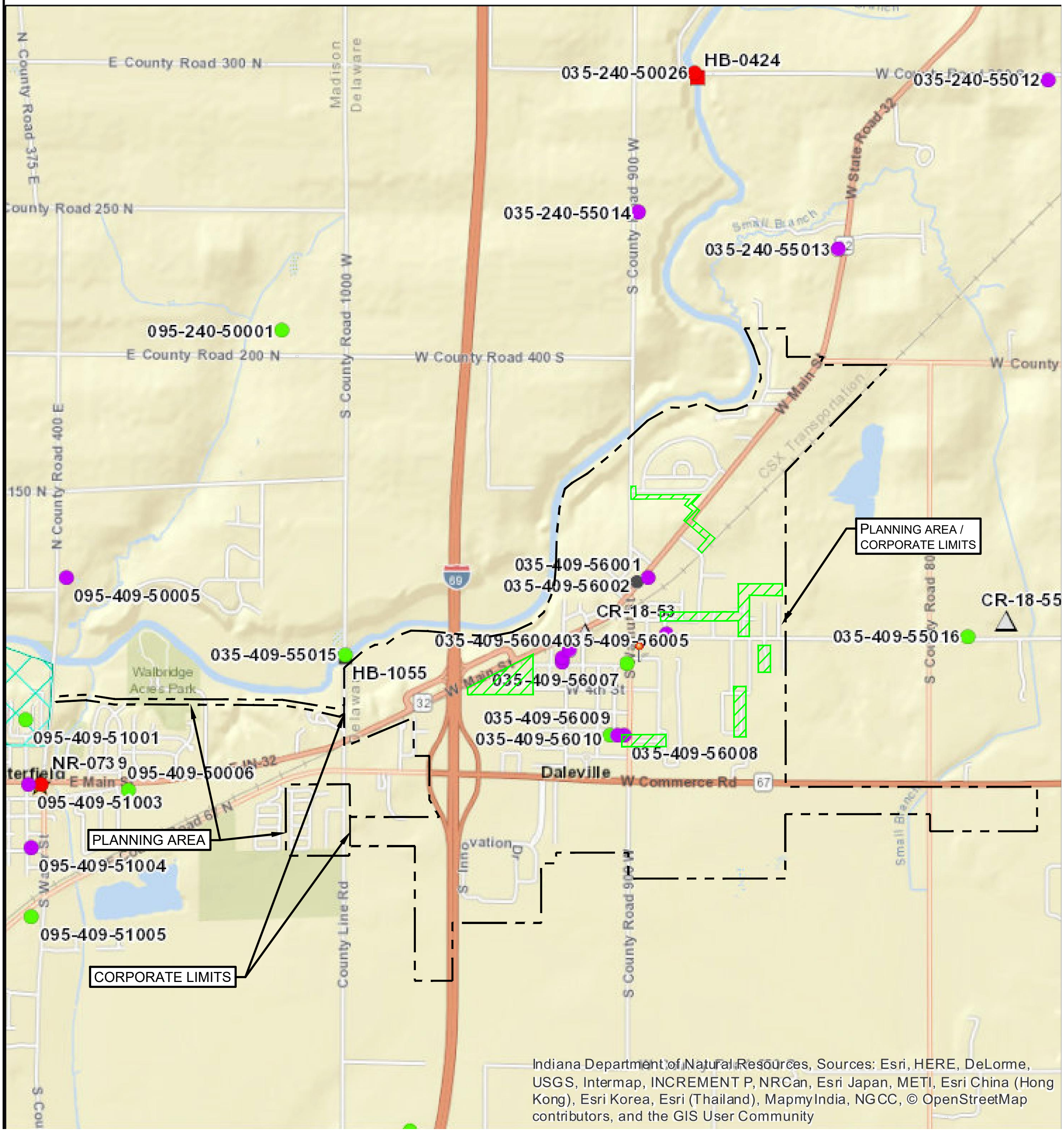
3,500' 0 3,500'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

HISTORICAL SITES
FIGURE 5-2



Addresses
Cemeteries
Outstanding
Notable
Contributing
Non-Contributing
Demolished
Unknown

LEGEND

STORM WATER IMPROVEMENTS AREAS

SCALE: 1"=3,500'

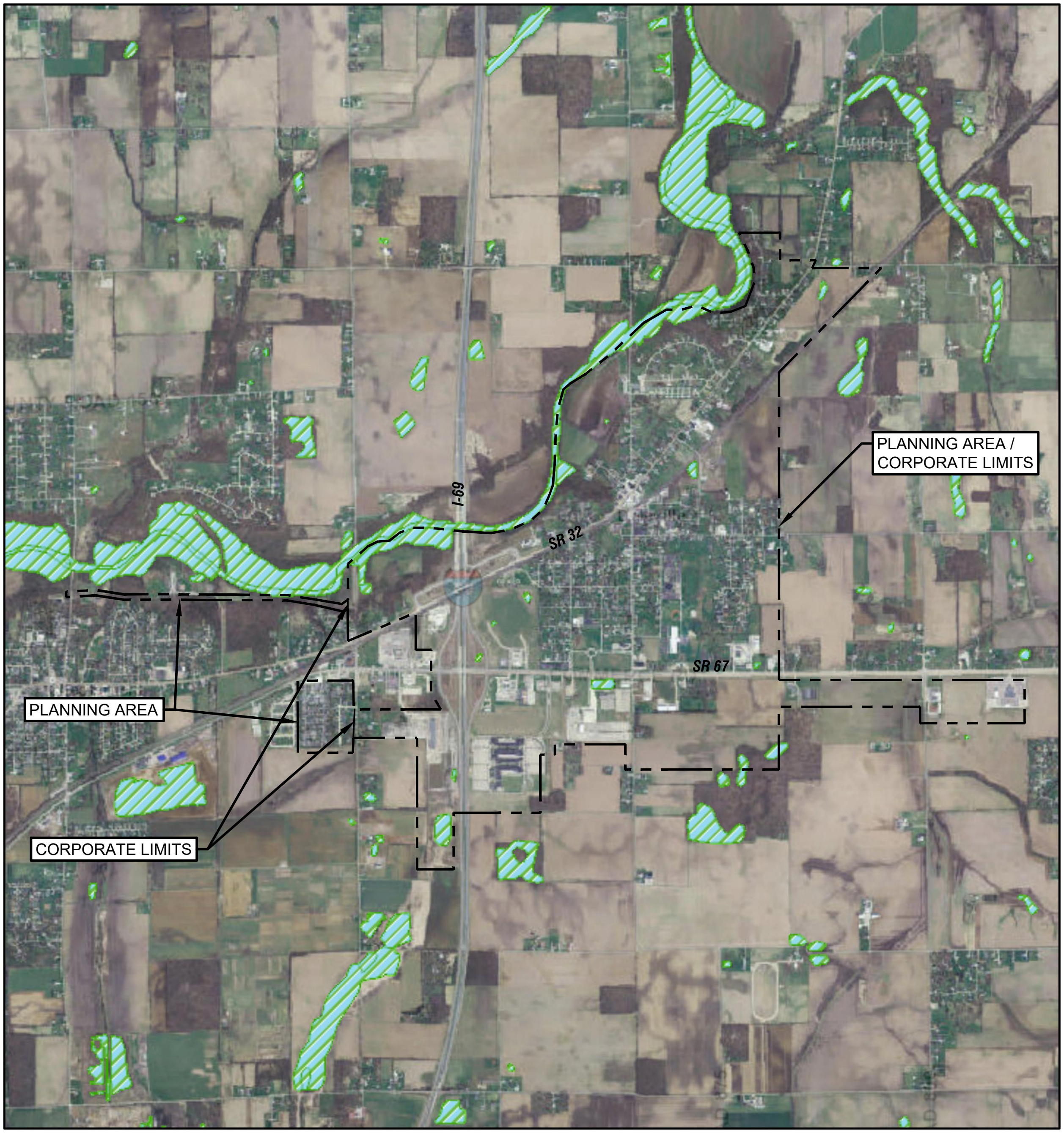
3,500' 0 3,500'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

HISTORICAL SITES
FIGURE 5-2A



Wetlands NWI (USFWS)

Wetlands Project Metadata NWI (USFS)

SCALE: 1"=2,500'

2,500' 0 2,500'

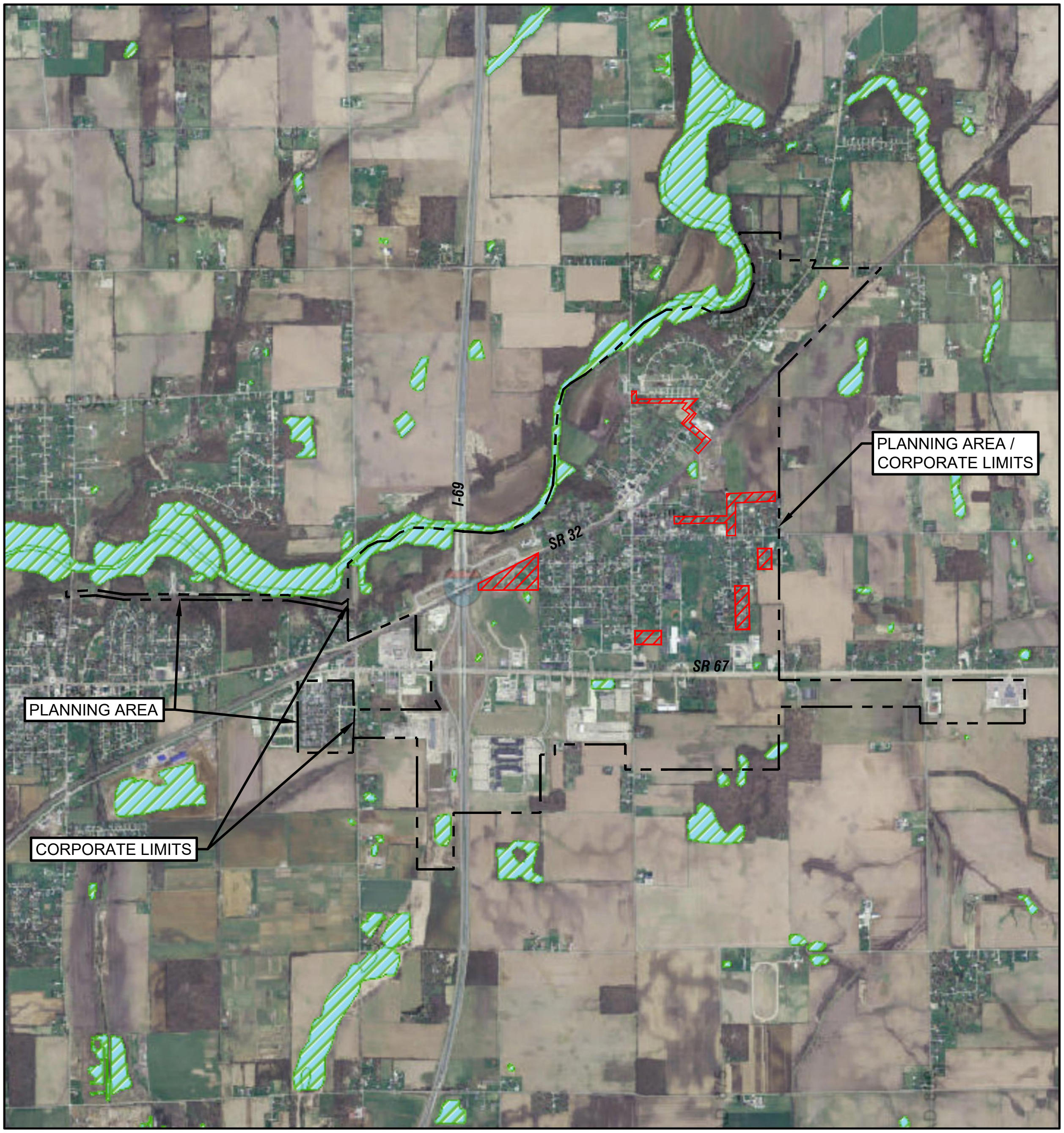
COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WETLANDS MAP
FIGURE 5-3

g:\clients a-i\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:04 AM BY: George Rader



Wetlands NWI (USFWS)

Wetlands Project Metadata NWI (USFS)

LEGEND
STORM WATER IMPROVEMENTS AREAS

SCALE: 1"=2,500'

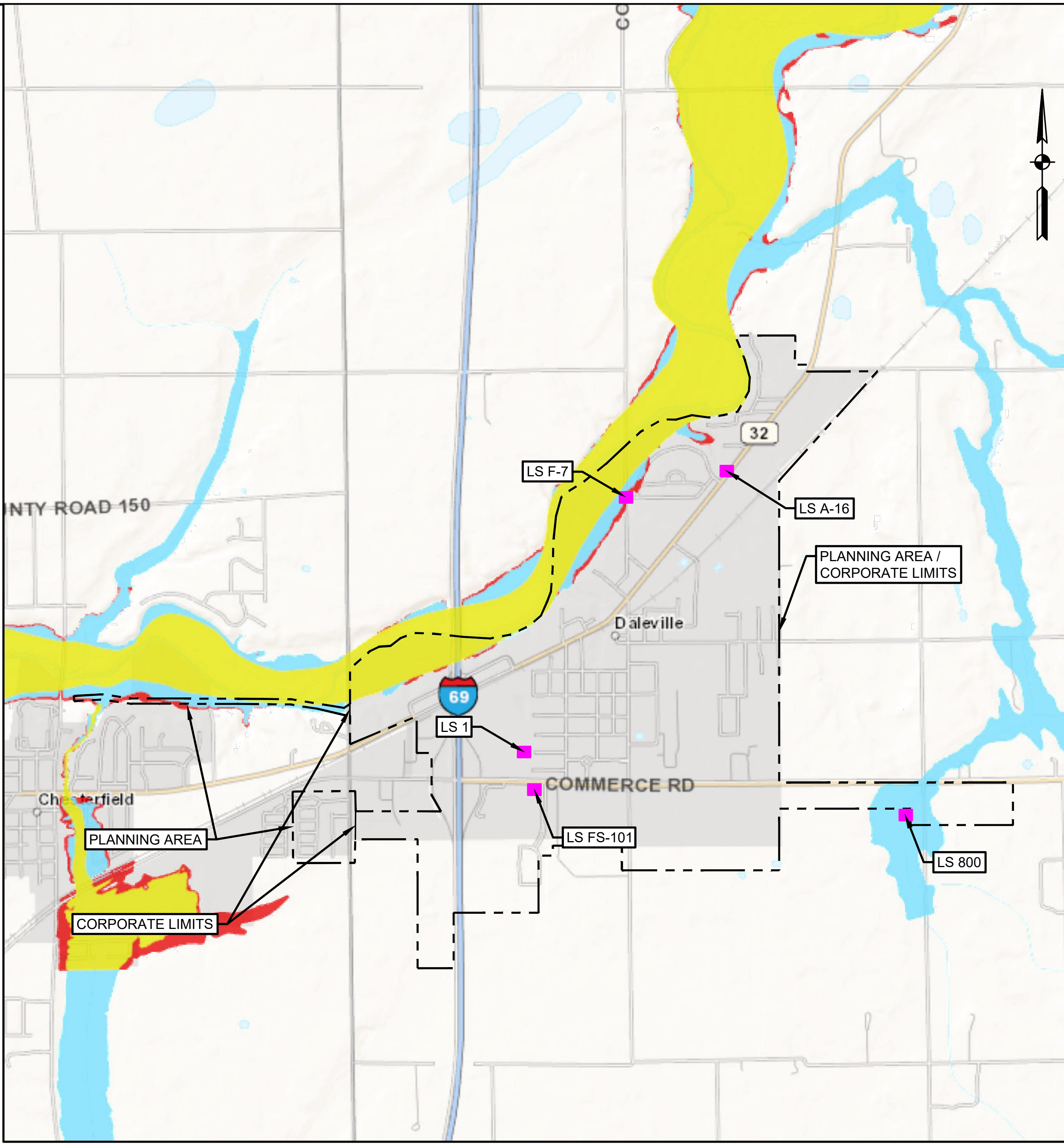
2,500' 0 2,500'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WETLANDS MAP
FIGURE 5-3A



Floodplains - FIRM

- Floodway
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance, Protected by Levee
- 0.2% Annual Chance Flood Hazard
- Lift Station

SCALE: 1"=2,500'

2,500' 0 2,500'

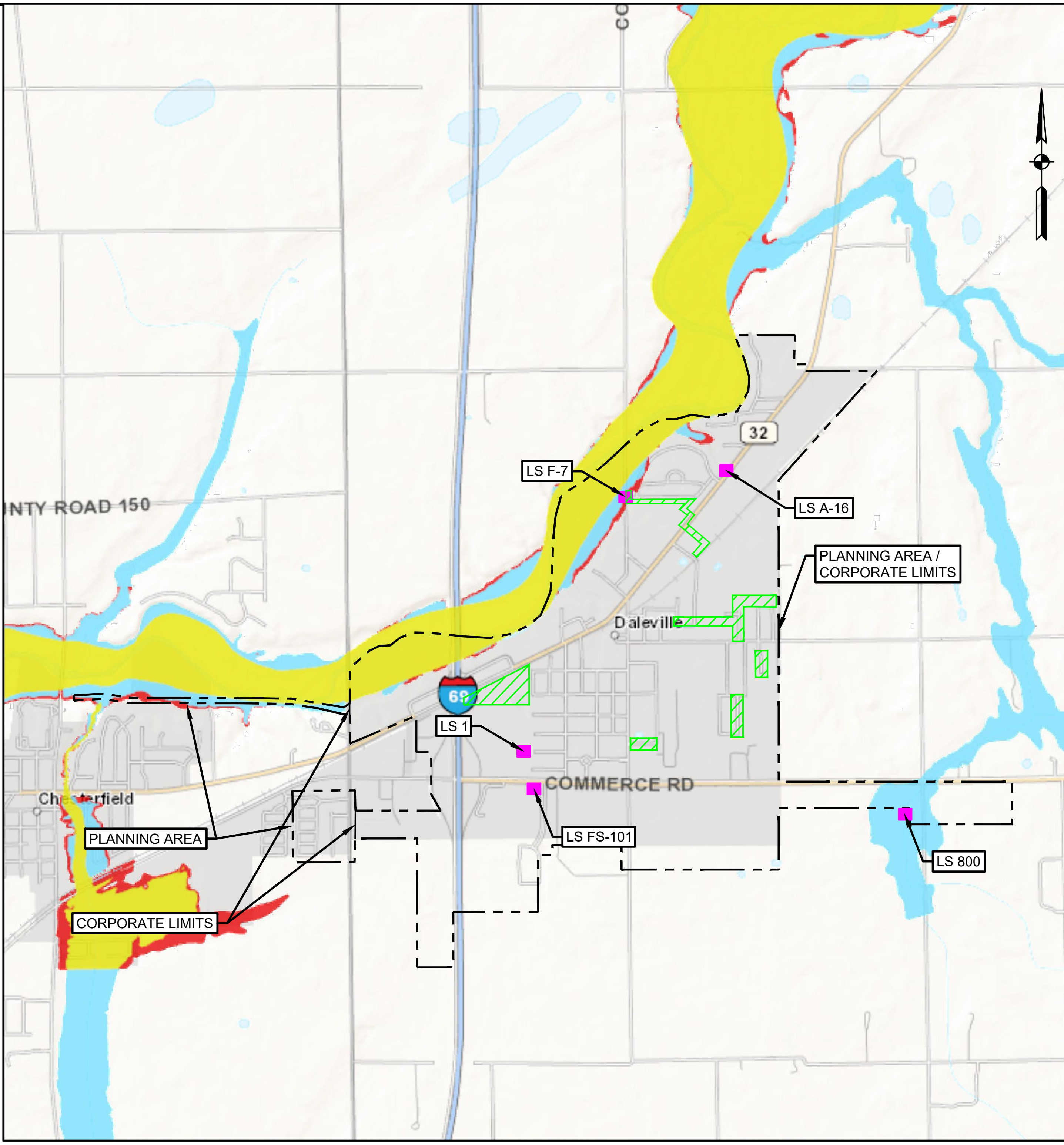
COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

FLOOD PLAINS MAP
FIGURE 5-4

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader



Floodplains - FIRM

- Floodway
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance, Protected by Levee
- 0.2% Annual Chance Flood Hazard
- Lift Station

SCALE: 1"=2,500'

2,500' 0 2,500'

LEGEND

STORM WATER IMPROVEMENTS AREAS

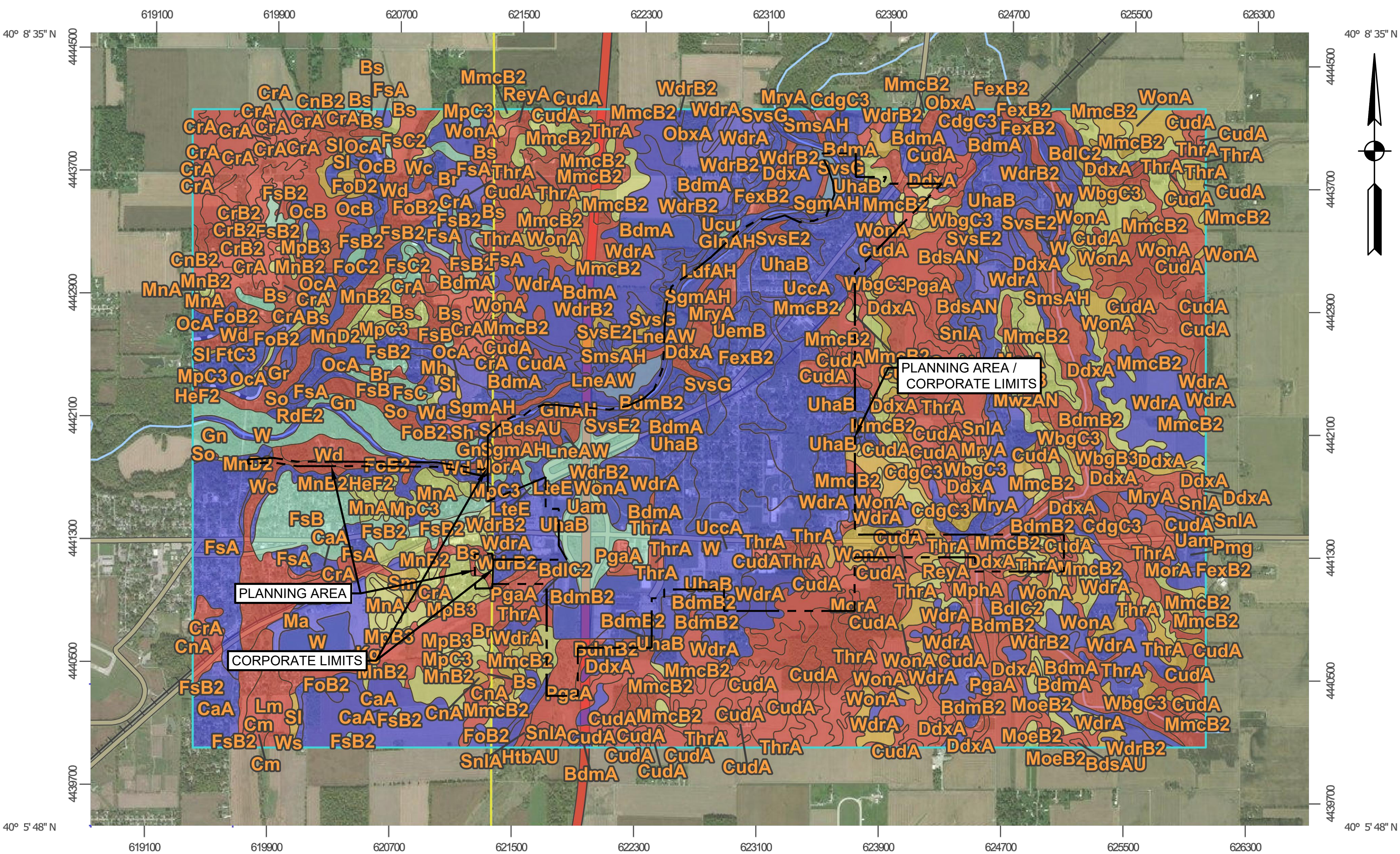
COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

FLOOD PLAINS MAP
FIGURE 5-4A

Depth to Water Table—Delaware County, Indiana, and Madison County, Indiana



SCALE: 1"=3,000'

3,000' 0 3,000'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

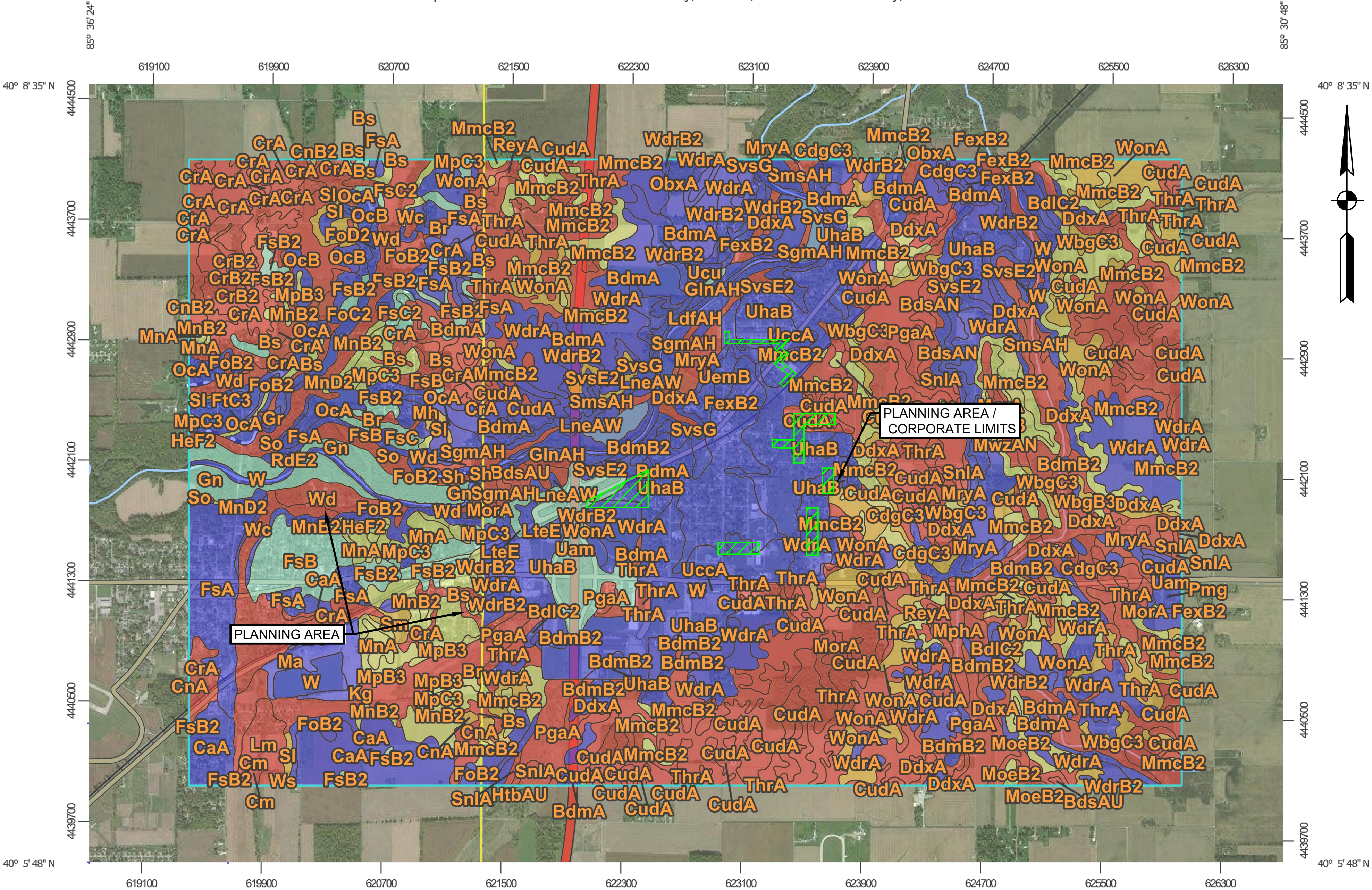
WASTEWATER AND STORMWATER UTILITY MASTER PLAN

DEPTH TO WATER TABLE
FIGURE 5-5A

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:04 AM BY: George Rader

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader

Depth to Water Table—Delaware County, Indiana, and Madison County, Indiana



LEGEND	
(green hatch)	STORM WATER IMPROVEMENTS AREAS

SCALE: 1"=3,000'

3,000' 0 3,000'

COMMONWEALTH ENGINEERS, INC.

A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

DEPTH TO WATER TABLE
FIGURE 5-5B

Depth to Water Table—Delaware County, Indiana, and Madison County, Indiana

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Survey Areas
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Delaware County, Indiana
Survey Area Data: Version 21, Oct 2, 2017

Soil Survey Area: Madison County, Indiana
Survey Area Data: Version 20, Oct 2, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 1, 2011—Apr 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

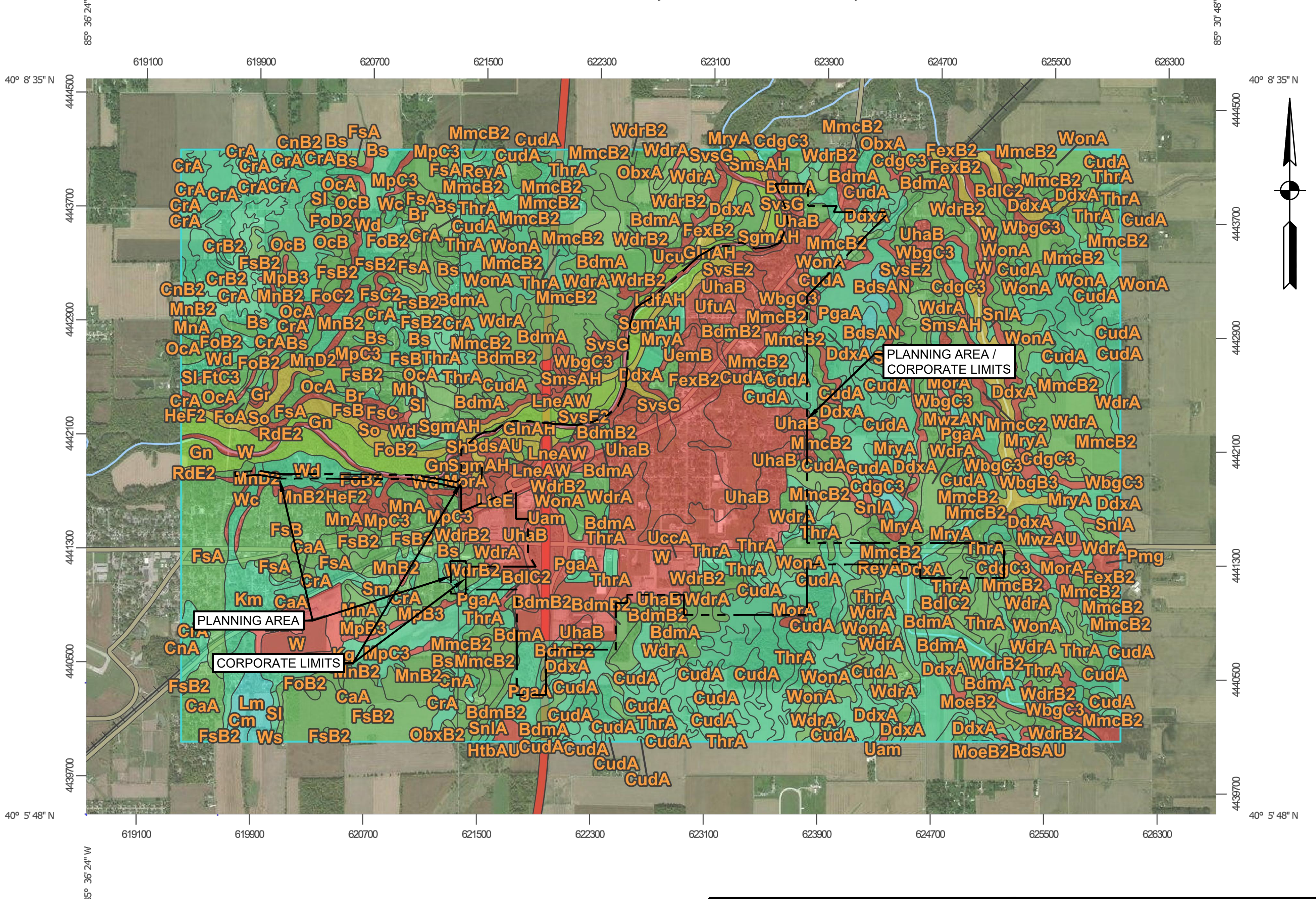
COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

DEPTH TO WATER TABLE LEGEND
FIGURE 5-5C

Farmland Classification—Delaware County, Indiana, and Madison County, Indiana



SCALE: 1"=3,000'

3,000' 0 3,000'

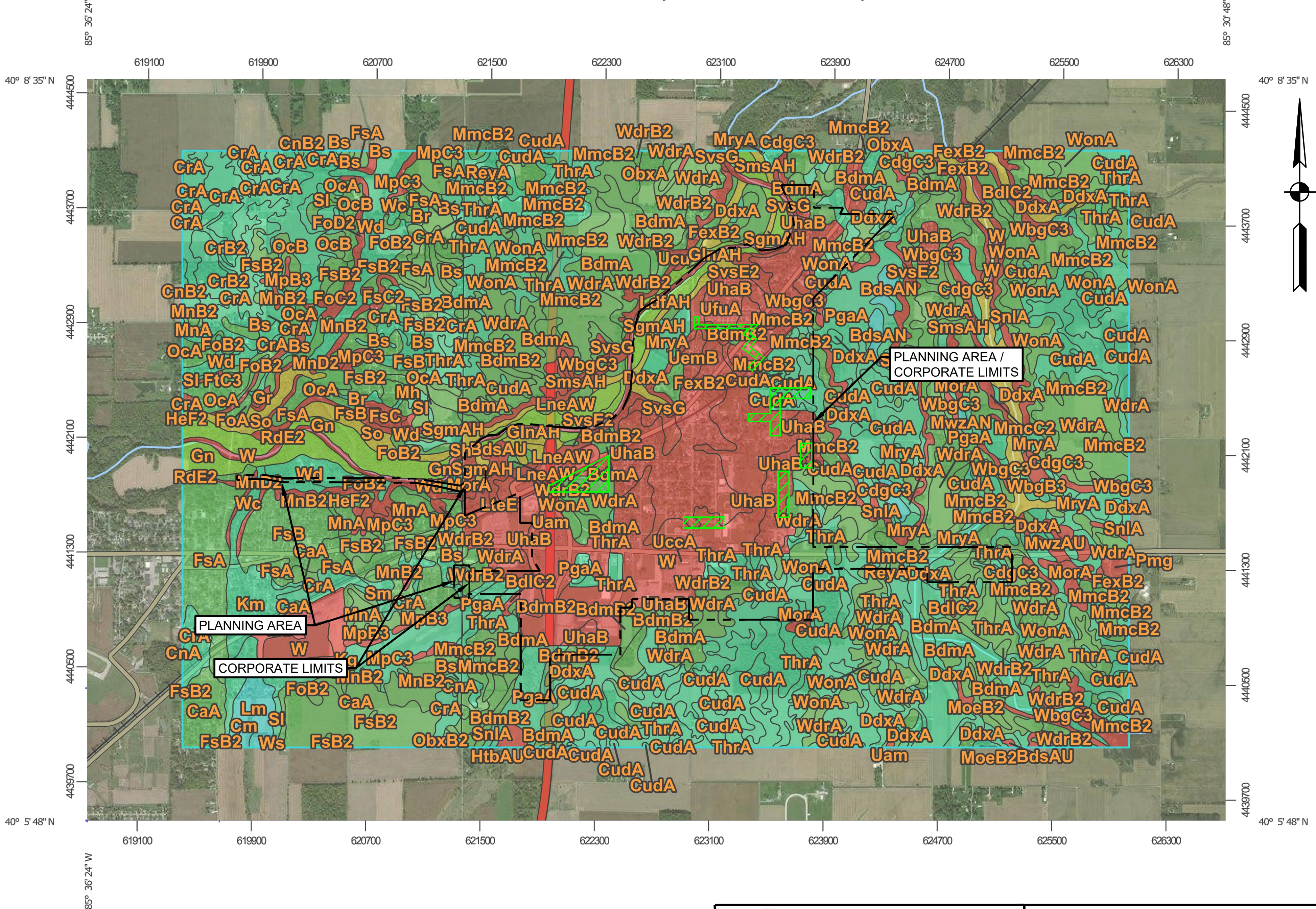
COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA DELAWARE COUNTY
WASTEWATER AND STORMWATER UTILITY MASTER PLAN
PRIME FARMLAND MAP FIGURE 5-6A

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\PER DALEVILLE.dwg PRINTED: 6/14/2019 9:05 AM BY: George Rader

Farmland Classification—Delaware County, Indiana, and Madison County, Indiana



LEGEND

STORM WATER IMPROVEMENTS AREAS

SCALE: 1"=3,000'

3,000' 0 3,000'

COMMONWEALTH ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

PRIME FARMLAND MAP
FIGURE 5-6B

Farmland Classification—Delaware County, Indiana, and Madison County, Indiana

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

PRIME FARMLAND LEGEND
FIGURE 5-6C

Section 6 – Selected Plan

The purpose of this chapter is to provide a discussion of the recommended alternative (Selected Plan), project related costs, and a proposed project implementation schedule. Selection of the most feasible alternative was based upon cost-effective analysis methods and consideration was also given to non-monetary impacts.

Wastewater

6.1 Project Description

Figure 6-1 shows the proposed wastewater project. The Selected Plan generally consists of projects listed in **Table 6-1**.

Table 6-1 List of Projects

Lift Stations
• All five (5) lift stations will get new 120 GPM pumps (10 total pumps) • All five (5) lift stations will be rehabilitated to Class 1, Division 1 standards and lined
Collection System
• Entire collection system will be cleaned and televised • Entire collection system will be rehabilitated with CIPP • All manholes will be rehabilitated and lined • Laterals will be rehabilitated with CIPP to the edge of the right-of-way • Point repairs will be completed as needed
Flow Meter
• one (1) new parshall flume and ultrasonic meter at the end of the 12-inch interceptor sewer • one (1) new parshall flume and ultrasonic meter at the edge of Daleville's corporate limits • one (1) new parshall flume and ultrasonic meter at the connection into the interceptor sewer from the Laurelwood and Royal Oaks neighborhoods
Operation
• Add to and upgrade existing SCADA system for all wastewater components

6.2 Project Phasing

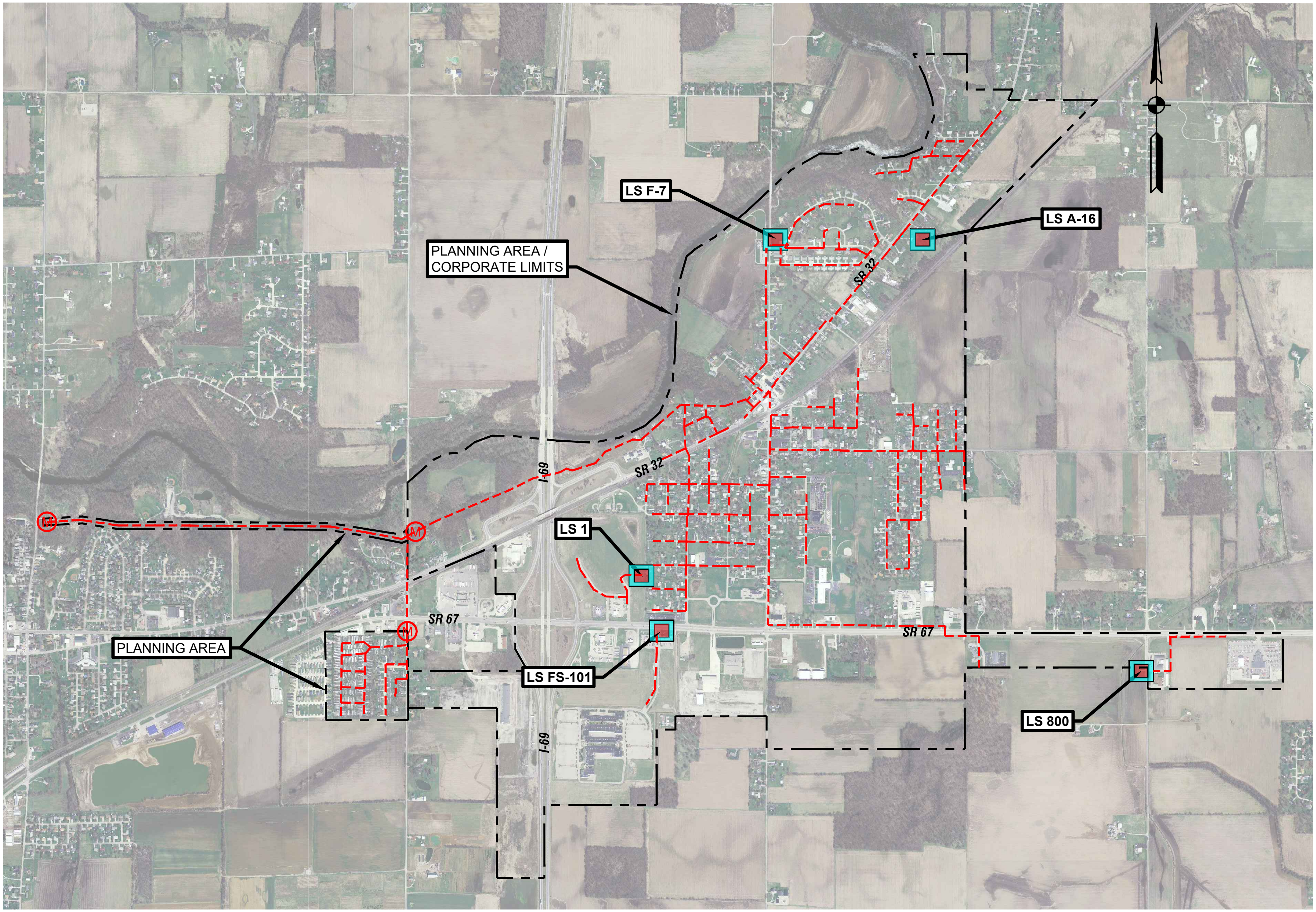
Due to the size and complexity of the proposed wastewater system improvements in the recommended project, the components have been prioritized so Daleville can consider phasing. Each project is prioritized as high, medium-high, medium, or low priority. High priority projects should be addressed first followed by medium-high projects. Medium priority projects should be addressed after all high and medium-high priority projects are completed. Low priority projects should be addressed after all medium priority projects are completed. High, medium-high, and medium priority projects address system deficiencies and large sources of I/I. Low priority projects typically address I/I sources only.

Projects and their priorities are shown in **Table 6-2** below. This table includes the priority level, construction costs, non-construction costs, total capital costs, and cumulative capital costs.

Table 6-2
Project Phasing

Project	Priority	Construction Cost	Non-Construction Cost	Total Capital Costs	Cumulative Capital Costs
Increase all Five (5) Lift Stations Capacity	High	$363,000	$90,800	$453,800	$453,800
Rehabilitate all Five (5) Lift Stations (lining, Class 1/Div. 1, Mechanical)	High	$217,800	$54,700	$272,500	$726,300
Construction of Three (3) Proposed Flow Meters	High	$91,400	$23,000	$114,400	$840,700
Total High Priority Costs		**$672,200**	**$168,500**	**$840,700**	
Upgrade/New SCADA system	Medium-High	$108,700	$27,200	$135,900	$976,600
Clean and Televise All Sewers	Medium-High	$534,200	$133,600	$667,800	$1,644,400
CIPP Segments B-2 to XX-22, Rehab/line manholes, Point Repair, Lateral Rehabilitation	Medium-High	$997,300	$249,400	$1,246,700	$2,891,100
Total Medium-High Priority Costs		**$1,640,200**	**$410,200**	**$2,050,400**	
CIPP Segments XX-22 to XX-1, Rehab/line manholes, Point Repair, Lateral Rehabilitation	Medium	$1,994,600	$498,700	$2,493,300	$5,384,400
Total Medium Priority Costs		**$3,634,800**	**$908,900**	**$4,543,700**	
CIPP Segments rest of sewers, Rehab/line manholes, Point Repair, Lateral Rehabilitation	Low	$6,980,900	$1,745,300	$8,726,200	$14,110,600
Total Low Priority Costs		**$6,980,900**	**$1,745,300**	**$8,726,200**	
Total Costs		**$11,287,900**	**$2,822,700**	**$14,110,600**	**$14,110,600**

Figure 6-2 shows the wastewater phased project represented by the high priority plus medium-high priority projects represented by the middle column in **Table 6-2.**



LEGEND

- CORPORATE LIMITS / PLANNING AREA
- SANITARY SEWERS, LATERALS, AND MANHOLES TO BE CLEANED, TELEVISED, AND REHABILITATED
- PROPOSED FLOW METER
- PUMP UPGRADE AND REHABILITATION
- ELECTRICAL REHABILITATION AND SCADA

SCALE: 1"=2000

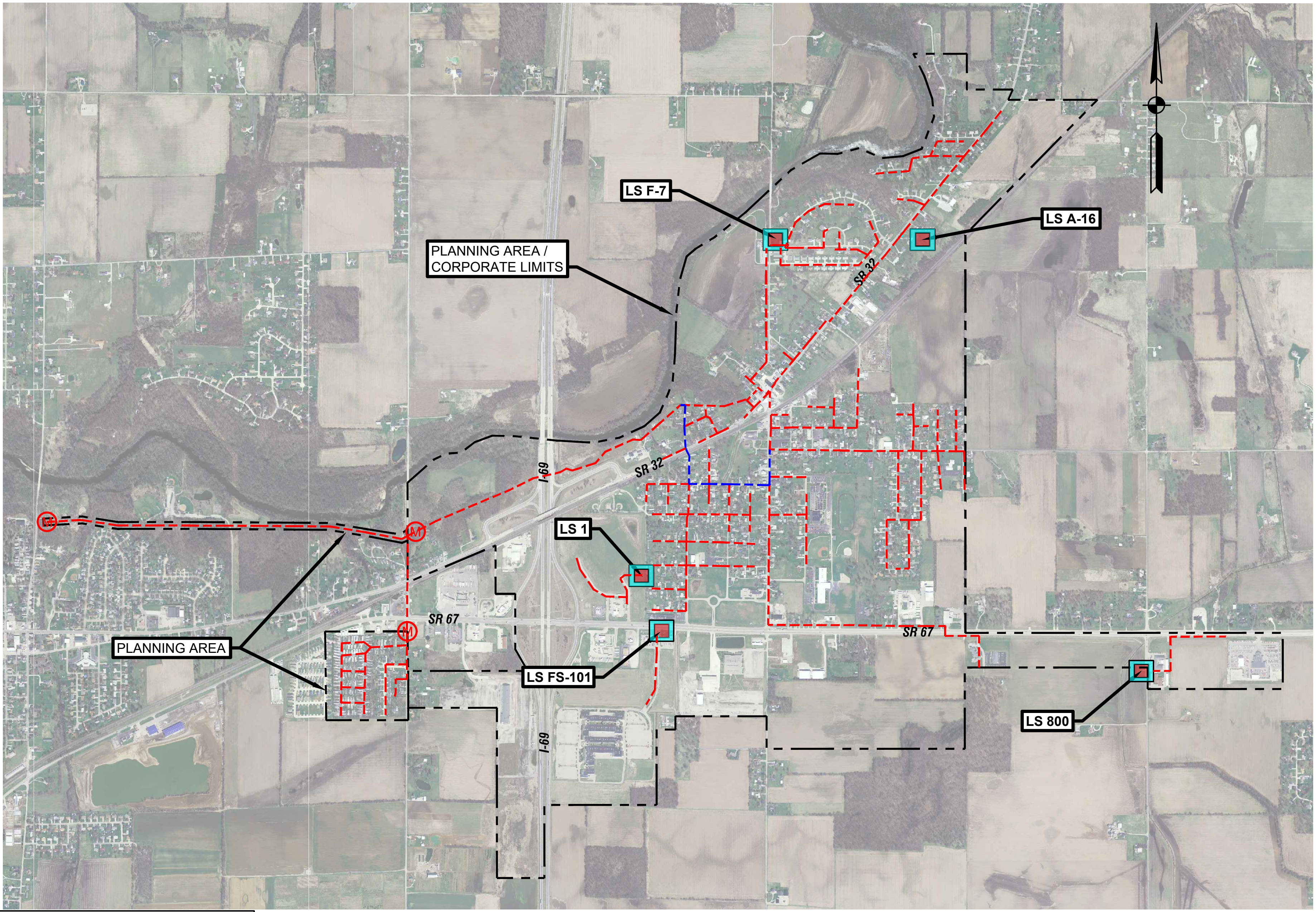
2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER RECOMMENDED
FIGURE 6-1



LEGEND

	CORPORATE LIMITS / PLANNING AREA
	SANITARY SEWERS AND MANHOLES TO BE CLEANED AND TELEVISED
	SANITARY SEWERS AND MANHOLES TO BE CLEANED, TELEVISED, AND REHABILITATED
M	PROPOSED FLOW METER
	PUMP UPGRADE AND REHABILITATION
	ELECTRICAL REHABILITATION AND SCADA

SCALE: 1"=2000

2000' 0 2000'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

WASTEWATER PHASED PROJECT
FIGURE 6-2

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader

6.3 Estimate of Probable Project Construction Cost

The recommended wastewater project estimated cost is presented in **Table 6-3**. This preliminary estimate includes cost for construction, a 10% construction contingency, and the estimated non-construction costs.

Table 6-3
Estimate of Probable Project Construction Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$462,300
Erosion Control	$138,700
Traffic Control	$296,000
Bypass Pumping	$120,000
Pump Upgrade and Rehabilitation	$450,000
Electrical Rehabilitation And SCADA	$120,000
Clean and Televise	$416,900
Rehab Manholes and CIPP	$5,323,800
Point Repair and Lateral work	$2,858,400
Parshall Flume, I&C and Structure	$75,600
Subtotal	**$10,261,700**
Contingency (10%)	$1,026,200
Total Construction Costs	**$11,287,900**
Estimated Non-Construction Costs	
Non-Construction Costs	$2,822,700
Total Non-Construction Costs	**$2,822,700**
Total Capital Costs	**$14,110,600**

6.4 Project Schedule

The project schedule for performing all of the recommended alternative is shown below in **Table 6-4**. The project schedule shows the timeline starting with the completion and approval of this master plan.

Table 6-4
Wastewater Proposed Project Schedule

Completion of PER	N/A
Town Authorizes Preparation of ER	N/A
Completion of ER	N/A
Town Files for Funding	N/A
Town Receives Funding Agency Approval	N/A
Town Authorizes Design	N/A
Completion of Final Design	N/A
Application and Receipt of Permits	N/A
Submission to Funding Agency for Permission to Bid	N/A
Town Advertises for Construction Bids	N/A
Town Receives Construction Bids	N/A
Town Authorizes Construction	N/A
Town Substantially Completes Construction	N/A
RUS Conducts Final Inspection	N/A

6.5 Green Project Reserve

Not completed for the wastewater system.

Storm Water

6.6 Project Description

Figure 6-3 shows the proposed storm water project. The Selected Plan generally consists of projects listed in **Table 6-5**.

Table 6-5 List of Projects

Ponding Area and I/I Improvements
• Construct a new storm pipes with catch basins and bioswales Baseball field
• Construct a new storm pipe with bioswales/hybrid ditches from Tennessee Street to River Road across SR 32
• Construct new 12-inch storm pipe with catch basins along West 6th Street • Construct new 12-inch storm pipe with catch basins along South Elbert Street • Construct new 12-, 15- and 18-inch storm pipe along north ends of Maple and Hickory, along John Street, and on to Wayne Street • Construct new 12-inch storm pipe with catch basins along Hickory Lane

6.7 Project Phasing

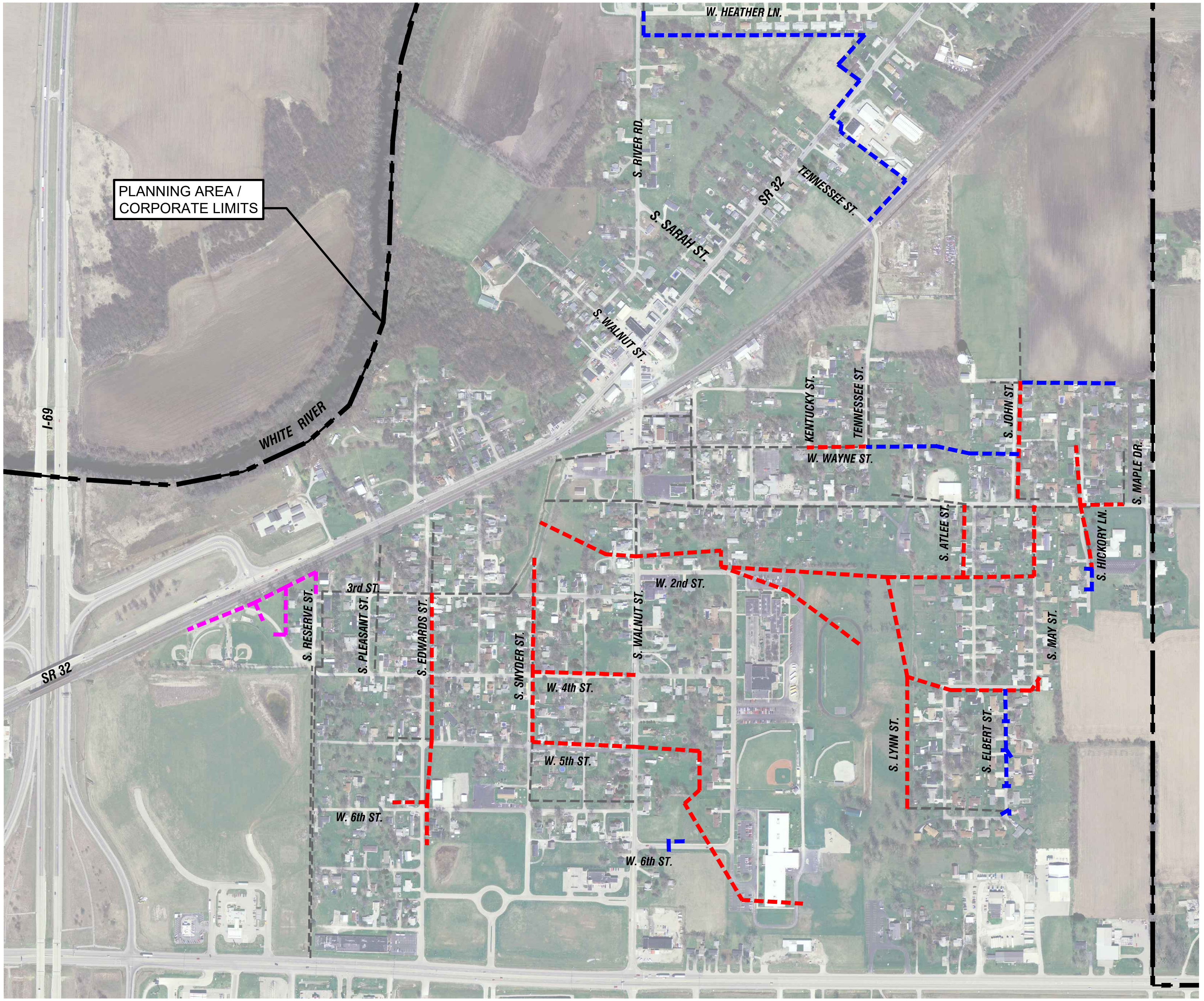
Due to the size of the proposed storm water system improvements in the recommended project and the lack of funds available from the existing rate, the components have been prioritized so Daleville can consider phasing. Each project is prioritized as high, medium, or low priority. High priority projects should be addressed first. Medium priority projects should be addressed after all high priority projects are completed. High and medium priority projects address noted flooding areas first.

Projects and their priorities are shown in **Table 6-6** below. This table includes the priority level, construction costs, non-construction costs, total capital costs, and cumulative capital costs.

Table 6-6
Project Phasing

Project	Priority	Construction Cost	Non-Construction Cost	Total Capital Costs	Cumulative Capital Costs
Storm Pipe and Catch Basin near SR 32 and the Baseball Fields	High	$635,500	$164,200	$799,700	$799,700
West 6th St. Storm Project	High	$7,200	$1,900	$9,100	$808,800
Total High Priority Costs		**$642,700**	**$166,100**	**$808,800**	
Elbert Street Storm Project	Medium	$207,100	$53,500	$260,600	$1,069,400
John Street Storm Project	Medium	$305,000	$78,700	$383,700	$1,453,100
Hickory Lane Storm Project	Medium	$45,800	$11,900	$57,700	$1,510,800
Total Medium Priority Costs		**$557,900**	**$144,100**	**$702,000**	
Total Costs		**$1,200,600**	**$310,200**	**$1,510,800**	**$1,510,800**

g:\clients a-l\daleville\d j17042 ww-sw utility\05 CAD\02-per-reports\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 9:06 AM BY: George Rader



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

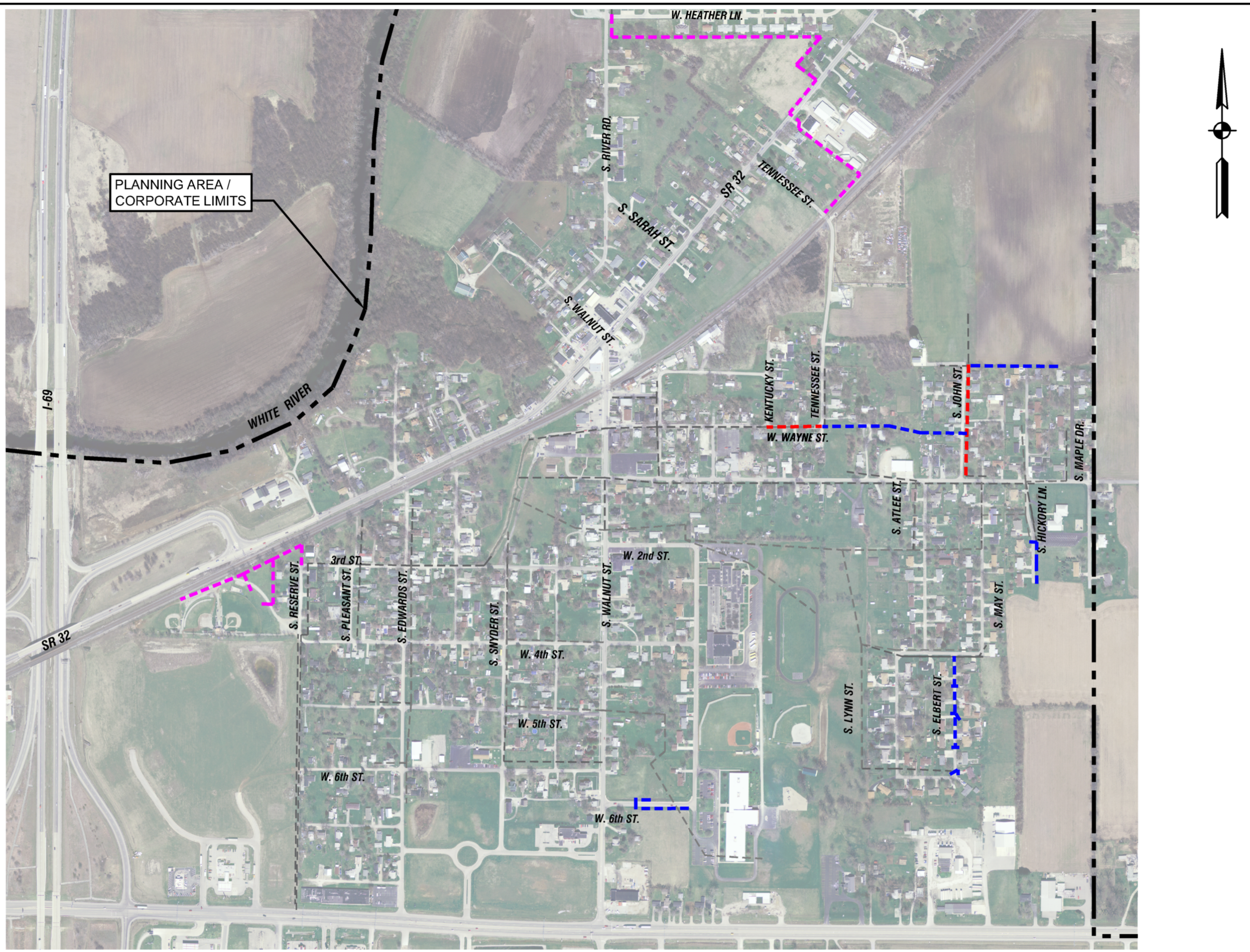
800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER RECOMMENDED
FIGURE 6-3



LEGEND

- EXISTING STORM SEWERS
- STORM SEWERS TO BE UP SIZED
- S.R. 32 AND BASEBALL FIELD IMPROVEMENTS
- STORM SEWERS TO BE ADDED

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER PHASED PROJECT
FIGURE 6-4

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\FIGURES\ALTERNATIVE PER.dwg PRINTED: 6/14/2019 1:27 PM BY: Jeremy Schmitt

6.8 Estimate of Probable Project Construction Cost

The recommended storm water project estimated cost is presented in **Table 6-7**. This preliminary estimate includes cost for construction, a 10% construction contingency, and the estimated non-construction costs.

Table 6-7
Estimate of Probable Project Construction Costs

Estimated Construction Costs	
Material Name	**Total**
Mobilization/Demobilization	$45,000
Erosion Control	$27,000
Traffic Control	$9,000
Baseball Fields and SR 32 Project	$534,000
West 6th St. Storm Project	$6,000
Elbert Street Storm Project	$174,000
John Street Storm Project	$258,000
Hickory Lane Storm Project	$38,400
Subtotal	**$1,091,400**
Contingency (10%)	$109,200
Total Construction Costs	**$1,200,600**
Estimated Non-Construction Costs	
Non-Construction Costs	$310,200
Total Non-Construction Costs	**$310,200**
Total Capital Costs	**$1,510,800**

6.9 Project Schedule

The project schedule for performing all of the recommended alternative is shown below in **Table 6-8**. The project schedule shows the timeline starting with the completion and approval of this master plan.

Table 6-8
Storm Water Proposed Project Schedule

Completion of PER	June 2019
Town Authorizes Preparation of ER	August 2019
Completion of ER	November 2019
Town Files for Funding	November 2019
Town Receives Funding Agency Approval	February 2020
Town Authorizes Design	November 2019
Completion of Final Design	June 2019
Application and Receipt of Permits	August 2020
Submission to Funding Agency for Permission to Bid	September 2020
Town Advertises for Construction Bids	December 2020
Town Receives Construction Bids	February 2021
Town Authorizes Construction	March 2021
Town Substantially Completes Construction	February 2022
RUS Conducts Final Inspection	January 2022

6.10 Green Project Reserve

This project will include adding bioswales and hybrid ditches wherever possible along with new storm pipes for each project area. This work qualifies as a "Categorical Project" under the Green Infrastructure section of the SRF GPR checklist.

Investigations into GPR eligibility are ongoing. It is understood that all request for GPR status must be submitted prior to SRF loan closing. The GPR checklist is included as Appendix G.

Section 7 – Legal, Financial & Managerial Capabilities

7.1 General

These resolutions are expected to be approved at the Town's meeting on June 17, 2019 and will be submitted at that time.

7.2 SRF Project Financing Information

The completed SRF Project Financing Form is included in **Appendix H**.

7.3 Easement Acquisition

Executed easements will be obtained and provided to SRF prior to request for bidding.

7.4 Fiscal Sustainability Plan/Asset Management Program

The Town of Daleville will develop an Asset Management Program (AMP) that meets the minimum requirements defined by the State Revolving Fund's Asset Management Program Guidelines pursuant to Indiana Code 5-1.2-10-16 and will submit a completed AMP Certification Form prior to request for final disbursement related to the primary project.

Section 8 – Public Participation

8.1 Public Hearing

The public hearing has been properly advertised and will be held on June 17, 2019. The publisher's affidavit, sign-in sheet, and meeting minutes will be provided to SRF upon completion of the hearing.

Written comments received either before, during, or after the public hearing along with any responses provided will also be provided to SRF.

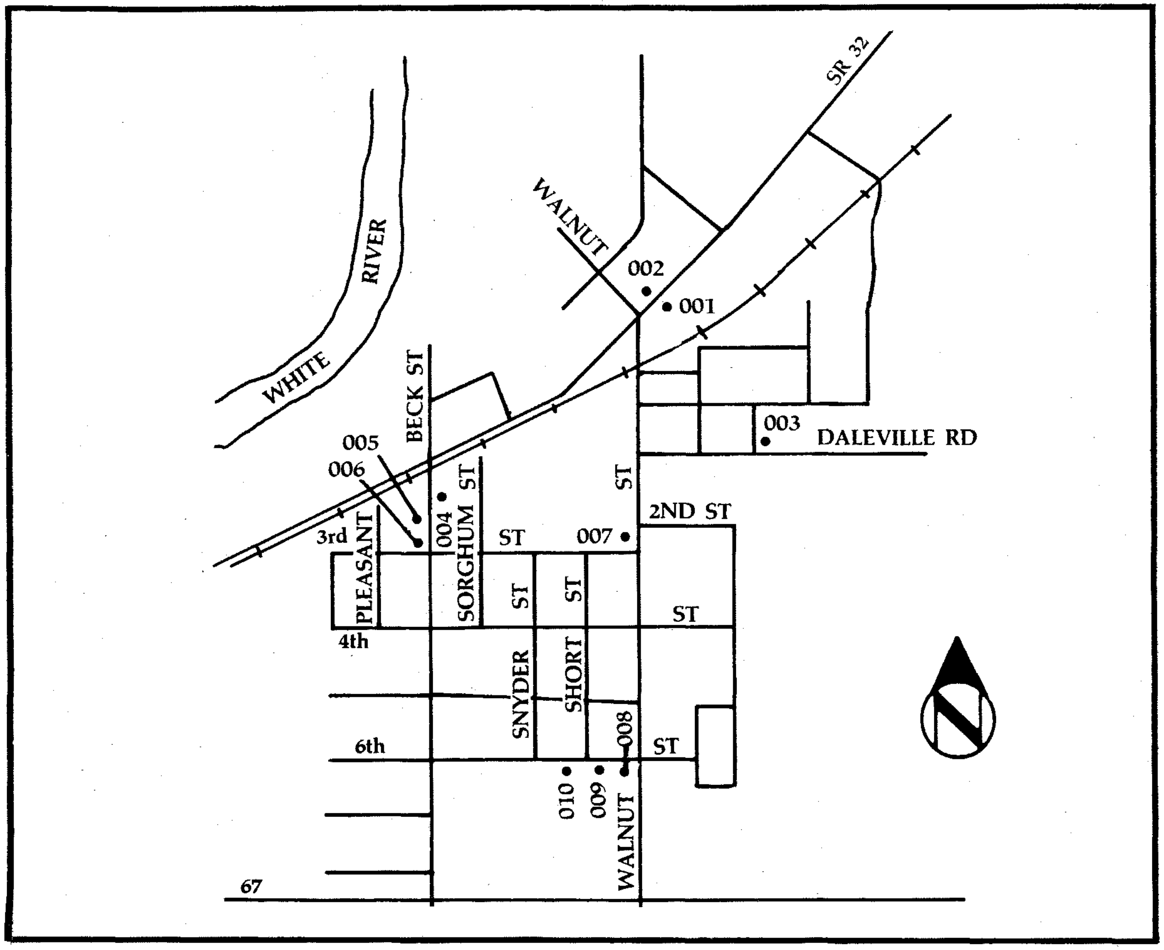
8.2 Impacted Properties/Mailing List

A mailing list with mailing labels will be provided to SRF upon completion of the public hearing and comment period.

Appendix A

Interim Report

Daleville Scattered Sites (56001-010)



No.	Rtg.	Description
001	C	**House,** State Road 32; Carpenter-Builder, c.1890; Architecture (409)
002	C	**House,** State Road 32; American-Four Square, c.1910; Architecture (409)
003	C	**Daleville Christian Church,** Colonial Road; Colonial Revival, c.1900; Architecture, Religion (409)
004	C	**House,** 220 Edwards Street; Carpenter-Builder, c.1890; Architecture (409)
005	C	**House,** 205 Edwards Street; Bungalow, c.1915; Architecture (409)
006	C	**Fetrow House,** 201 Edwards Street; Carpenter-Builder, c.1915; Architecture (409)
007	C	**House,** 201 Walnut Street; Carpenter-Builder, c.1900; Architecture (409)
008	N	**Cranor House,** 601 Walnut Street; Queen Anne, c.1895; Architecture (409)
009	C	**House,** 108 Sixth Street; Queen Anne, c.1900; Architecture (409)
010	N	**Schlegel House,** 206 Sixth Street; Queen Anne, c.1885; Architecture (409)


010

Appendix B

Storm Water Map

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 3/1/2018 4:26 PM BY: Aaron Rowley

LEGEND

- APPROX TOWN LIMITS
- FORCE MAIN
- MANHOLE
- LIFT STATION
- 12" SANITARY SEWER
- 10" SANITARY SEWER
- 8" SANITARY SEWER

SCALE: 1"=800'
800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.
A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

EXISTING SANITARY SEWER COLLECTION SYSTEM
APPENDIX-B

Appendix C

Storm Water Sewer Collection System

G:\Clients A-L\Daleville\D J17042 WW-SW Utility\05 CAD\02-PER-REPORTS\PER DALEVILLE.dwg PRINTED: 3/1/2018 4:26 PM BY: Aaron Rowley

LEGEND

— · · — · · —	CORPORATE LIMITS / STORMWATER PLANNING AREA	●	EXISTING CATCH BASIN / MANHOLE
cyan line	EXISTING 84" STORM PIPE	culvert symbol	EXISTING CULVERT
orange line	EXISTING 36" STORM PIPE	blue line	EXISTING 15" STORM PIPE
green line	EXISTING 24" STORM PIPE	yellow line	EXISTING 12" STORM PIPE
magenta line	EXISTING 18" STORM PIPE	red line	EXISTING 10" STORM PIPE

SCALE: 1"=800'

800' 0 800'

COMMONWEALTH™ ENGINEERS, INC.

A wealth of resources to master a common goal.

TOWN OF DALEVILLE, INDIANA
DELAWARE COUNTY

WASTEWATER AND STORMWATER UTILITY MASTER PLAN

STORM WATER SEWER COLLECTION SYSTEM
APPENDIX-C

Appendix D

DCRWD and Chesterfields Agreement

MUNICIPAL WASTEWATER SERVICE AGREEMENT
BETWEEN
THE TOWN OF CHESTERFIELD, INDIANA
AND
THE DELAWARE COUNTY REGIONAL WASTEWATER DISTRICT

THIS AGREEMENT, made and entered into this _____ day of May, 2011, by and between the TOWN OF CHESTERFIELD, INDIANA, a municipal corporation in Madison County, Indiana, by and through its Town Council (hereinafter referred to as "Town") and the DELAWARE COUNTY REGIONAL WASTEWATER DISTRICT, a sewer district in Delaware County, Indiana, by and through its Board of Trustees (hereinafter referred to as "District").

WITNESSETH THAT:

WHEREAS, the Town is in the process of constructing a sewage treatment and disposal facility and has capacity in excess of that required to process its own wastewater, liquid wastes and sewage, and is willing to accept wastewater, liquid wastes and sewage from the District and process and dispose of the same; and

WHEREAS, the District does not have adequate means of disposing of its wastewater, liquid wastes and sanitary sewage from the District; and

WHEREAS, the District desires to connect the sewer system of the District to the sewage treatment and disposal facilities of the Town of Chesterfield and will transport wastewater, liquid wastes and sewage generated within the jurisdiction of the District to the sanitary sewer system of the Town; and

WHEREAS, both the Town and the District have retained the firm of H.J. Umbaugh and Associates to analyze the costs of dedicating capacity and operating and maintaining the wastewater treatment facilities, and said firm has recommended a rate structure that would allocate fees and charges in a manner that would be fair to both the Town and the District; and

WHEREAS, the Town and the District desire to enter into a mutually beneficial agreement for the operation of the sewage treatment and disposal facility and the disposal of sanitary sewage from the District.

NOW THEREFORE, it is hereby agreed by and between the parties hereto that the Town will accept from the District the wastewater, liquid wastes and sewage of the District and will treat and dispose of the same in the proper manner when its sewage treatment plant has been fully constructed and operational subject to the following covenants and conditions.

1. The District agrees to extend, as necessary, its sewer to connect into the Town's sanitary sewer system at a point that is to be mutually agreed upon by the parties and described in "Exhibit C" which is attached hereto and made a part of this Agreement.

2. The Town agrees to accept, transport, treat and process in a proper manner all wastewater, liquid wastes and sewage transported from the District to the Town system by means of such sewer, subject to the conditions hereinafter set forth in this Agreement.

3. The Town and District agree to equally pay for all costs necessary to install and maintain at the point of connection to the Town's sewer system, the necessary metering and sampling equipment and all appurtenant devices for properly measuring the quantity and quality of wastewater delivered to the Town's Wastewater Treatment Plant. This shall be the official sampling point for the quality determination of the wastewater generated by the District. Calibration of such metering equipment shall be performed not less than once every twelve (12) months or by request of either party. A meter registering not more than five percent (5%) above or below the test result at full scale shall be deemed to be accurate. The previous readings of any meter disclosed by test to be inaccurate shall be corrected for the two (2) months previous to such test in accordance with the percentage of inaccuracy found by such tests. If any meter fails to register for any period, the amount of wastewater treated during such period shall be deemed to be the amount of wastewater treated in the corresponding period immediately prior to the failure.

4. The duly authorized representatives of both the District and Town shall have rights of access during business hours to inspect and observe the operation of the meter provided for in the preceding paragraph hereof. The Town shall be the owner of the meter and the expense of operating, maintaining and calibrating the meter shall be paid equally by the District and the Town. Any records or charts from such meter or meters shall be kept by both the Town and the District, and shall be subject to examination by either party. Both the Town and the District may install additional meters at their own cost and expense to verify flow, provided however, that such meters shall not be considered official meters for the purpose of determining monthly rates and charges.

5. The District has or will construct and maintain a sewage collection system, including sewers, pump stations, force mains, regulating stations, manholes and other structures, as may be required to deliver the flow of wastewater, liquid wastes and sewage to the point of connection to the Town. The District shall use all necessary

precautions and diligence to exclude from wastewater, liquid wastes and sewage transported to Town, sand, gravel, street waste, grits, leaves, rags, paper, pickling liquor, cyanide, coal, tar, oil, grease, acids, dry cleaning fluids, and any other foreign material and industrial wastes which are objectionable, dangerous and inhibitive to bacterial growth or which for other reasons cannot readily be treated in the sewage treatment plant of Town or may be injurious thereto or are prohibited by the Sewer Use Ordinances of Town, which may be amended from time to time. Upon discovery that unacceptable substances or materials as defined by the Sewer Use Ordinances of the Town of Chesterfield, Indiana, as amended from time to time, or waste or materials deemed unacceptable pursuant to rules and regulations duly promulgated by the U.S. Environmental Protection Agency (EPA) or the Indiana Department of Environmental Management (IDEM), are being discharged by District to Town, the District shall be notified and the District shall forthwith take appropriate steps to insure that such unacceptable materials are excluded from future discharges to Town. The District shall be liable for any additional costs at the wastewater treatment plant in connection with such unacceptable materials delivered from the District, including any fines as may be levied by the State of Indiana or E.P.A., for noncompliance with Town's NPDES (National Pollution Discharge Elimination System) permit. Upon discovery that any unacceptable substances or materials are being discharged as set forth above:

a. Either party shall immediately notify the other party of such unacceptable sewage or materials, including the location, time or times, the nature of such unacceptable sewage or waste, and such other information as may be available.

b. Upon verbal notification and confirmation thereof in writing, the District shall notify that user to immediately cease delivery of such materials and/or waste within twenty-four (24) hours, and continue all necessary monitoring to assure compliance with this Agreement.

c. The Town shall, in the event the District is unable to identify the location, time and source of such unacceptable sewage, cooperate with the District in locating such source. The District will use its best efforts to correct or cut off the user delivering unacceptable wastewater, liquid wastes and sewage to the parties' sewer system.

d. In the event that the user delivering such unacceptable sewage or materials through the District's connection point to Town cannot be ascertained within forty-eight (48) hours of first notice, then the District and Town shall authorize an independent emergency investigation to be instigated forthwith in regard to the matter. The District and Town shall fully cooperate with said emergency investigation to ascertain the user delivering such unacceptable sewage or material and severity of damage and necessary correction actions.

e. The parties shall determine and agree as to the severity of the damage caused to Town's treatment facilities resulting from the discharge of such unacceptable sewage or materials. If the parties are unable to reach such agreement, then both parties may agree within thirty (30) days after said negotiations fail, to each name an independent engineer or other person not connected with either party who has knowledge in the disputed areas. The two named arbitrators shall name a third qualified person to serve and the three arbitrators shall determine the unresolved issues between the parties. The judgment of findings of a majority of the arbitrators shall be binding upon the parties and final determination of all unresolved issues. In addition to the expenses, civil penalties, damages, or fines for the damage to the Town sewage system, the expense of such investigation or arbitration shall be borne by the District. It is the intent of the parties hereto that any arbitrator selected pursuant thereto shall have experience and expertise in the particular area of disagreement.

f. In the event that the parties are unable to ascertain the user delivering such unacceptable sewage or materials through the District's connection point to Town, then and in that event, if an emergency exists as to the continuing damage to Town's treatment facilities resulting from the discharge of such unacceptable sewage or material, Town may seek such equitable or injunctive relief as is necessary or appropriate in a court of competent jurisdiction.

g. In the event of a finding by a Court that a party has acted arbitrarily, capriciously or in bad faith regarding the inability of the parties to resolve issues arising out of this Paragraph 5, then the party who has acted in bad faith arbitrarily or capriciously shall pay the litigation expenses of the party who has not acted arbitrarily, capriciously or in bad faith.

6. The District agrees to adopt a sewer use and rate ordinance as required by law, and said ordinance shall be compatible with and at least as restrictive as the Town's sewage use ordinance as required by law.

7. The District has, or will enact, an ordinance which prohibits the introduction of surface water and ground water inflow into its sewage system and will otherwise enforce such prohibition.

8. The Town agrees to report to the District once each month, before the 15th day of each month, the volume and characteristics of the discharge of sewage into the Town system during the preceding calendar month. The characteristics measured or

otherwise identified and reported shall include, but not be limited to, volume and any waste constituents identified in Town's rate ordinance and/or sewer use ordinance. Sampling and analysis of the District's wastewater, liquid wastes and sewage shall be conducted in a comprehensive way and in accordance with acceptable engineering practice so as to reflect an accurate profile of the sewage to form the basis for fair and equitable variable charges.

9. The District reserves the right to verify the reports submitted by Town and may conduct such verifications, in accordance with acceptable engineering standards and shall have rights of ingress and egress onto the premises of Town as necessary and required to examine and verify documents and records subject of such report.

10. In the event the equipment (meter or sampler) should for any reason fail to provide Town with required reports and data as provided for hereinabove, Town shall make an estimate of the charges due from the District based upon prior flows and loadings and bill the District therefor as provided in this Agreement. If the correct actual charges due should be later determined, Town shall make appropriate adjustments in the next billing to the District.

11. The District agrees to pay to Town for the treatment and conveyance of wastewater, liquid wastes and sewage from the District an amount or amounts to be determined as follows:

    a. Variable Treatment Rate. Payment shall commence on the date Town first accepts wastewater for treatment from the District or any mutually agreeable date with said date to be endorsed by Addenda to this Agreement and signed by both parties. The District shall pay to Town for the treatment and conveyance of wastewater, liquid wastes and sewage from the District an amount as determined on Exhibit "A" hereof, "Calculation of Delaware County RWD Treatment Rate" to be completed and computed prior to connection. This rate shall be reviewed at the election of either party hereto upon written notice and request to the other, not more than annually nor less than every two (2) years and shall be adjusted according to conditions and circumstances existing at the time of any such adjustment. At the time of such adjustment or review, the Town of Chesterfield shall provide to the District a verified statement detailing the calculation of the rate based on the previous calendar year's operation and maintenance expense recorded by the Town of Chesterfield. The rate so determined shall be accepted by the District and shall be paid by said District to the Town of Chesterfield until modified again, as herein provided; provided, however, at each said time the District shall have the opportunity to examine the books and records of the Town of Chesterfield pertaining to the costs which determine said figure. If the District at such time and after such inspection does not agree with the figures of the Town of Chesterfield, it may submit any difference to a court of competent jurisdiction or arbitration as set out in Paragraph 16 of this Agreement.

The monthly charge for operation, maintenance and replacement shall be determined by multiplying the number of gallons of sewage accepted from the District as shown by said meter times the rate calculated.

The Town of Chesterfield shall, once each month, following the submission of the reports and data as heretofore provided in this Agreement, invoice the District for such operation, maintenance and replacement cost charges and such amount shall be due from the District to Town on the 30th day following the receipt of such invoice by the District. In the event that the District should fail to make payment to Town of the amount of such invoice within the time so limited, the District may be liable for and shall pay to Town, as a penalty for delinquency in such payment, the same percentage of such invoice, that the sewage rate ordinance and schedule of Town imposes upon all other users of Town's sewage disposal facilities for similar delinquencies in payment.

b. <u>Fixed Monthly Fee.</u> The District agrees to pay Town a fixed monthly fee for debt service and debt service coverage for the portion of the local cost incurred by Town in the construction of its wastewater treatment facility.

The fixed monthly fee will be determined on Exhibit "B" hereof "Calculation of Monthly Fixed Charge to Delaware County RWD for Debt Service and Coverage". The fixed monthly fee shall be fixed and in place for twenty years. The fixed monthly fee shall commence and be billable in the same manner as the variable fee as outlined in Section 11(a).

c. It is agreed that at the commencement of this Agreement, 310,000 gallons per day (G.P.D.) of the 1,000,000 G.P.D. annual average daily capacity of Town's sewage treatment facility is reserved to the District. To utilize this 31 percent of such capacity, the District is entitled to transport 113,150,000 gallons of wastewater, liquid wastes and sewage to Town each year at a peak daily rate of flow not to exceed 1,000,000 G.P.D. (During the peak day event, the average of the flow shall not exceed 1,000,000 G.P.D., the peak hourly rate shall not exceed 990 gallons per minute (G.P.M.), and this peak event shall not occur for more than 72 consecutive hours.)

For purposes of this Agreement, the District's contracted capacity measured in terms of average daily flow shall be calculated on a 30 day monthly basis and shall not exceed 310,000 G.P.D. If the District exceeds their 310,000

G.P.D. contracted capacity or if the District wishes to acquire additional capacity, this Agreement including the fee for debt service on the existing system shall be renegotiated. In the event the District requires additional capacity and cannot acquire such capacity from Town based upon the current design of the system, the District shall, at its own expense, pay all costs for necessary for the expansion of the Town sewage treatment facility. The manner in which the engineering, design and construction of the expansion shall be negotiated between the Town and the District at the time of the expansion. Any improvements made to the Town's sewage treatment facility shall become the property of the Town and subject to the rates and charges set forth in this Agreement.

d. In the case of (a) future treatment facility capital improvements required by IDEM and/or EPA for either achieving or maintaining compliance with N.P.D.E.S. permit requirements, or (b) the costs of necessary capital improvements or maintenance to the shared interceptor sewer from the District's flow meter at the point of connection to the Town's lift station, the lift station and the force main from the lift station to the Town's treatment plant, the District shall pay to Town its pro rata share of those capital improvements based on the average daily flows of the District and Town as outlined under Section 11(c).

12. In the event wastewater, liquid wastes and sewage are received by Town from the District in excess of domestic loadings, BOD and suspended solids now established in Town ordinances, then the District shall pay to Town the rate per pound therefor as established in the Town rate ordinance. In the event the wastewater, liquid wastes and sewage received by Town from the District are in excess of domestic loadings, BOD, and suspended solids, for three (3) consecutive months, Town may at Town's sole option, require the District to install and maintain an automated sampling devise at the District's sole cost and expense to monitor the quality of such discharge. In the event of future changes in the cost of treatment of suspended solids and BOD based upon the studies in conformity with EPA requirements, then the District shall be subject to any such increased or decreased charges for such excessive pollutants. In the event the future charges are made for other pollutants received by Town and such charges are uniformly applied throughout the region served by Town, then the District shall be subject to such charges.

13. The District acknowledges that Town has obtained certain Federal grants and that the provisions of PL 92-500 apply to the users within the jurisdiction of the District. The District agrees to cooperate with Town to the fullest extent so that the provisions of PL 92-500 as amended will be adhered to and complied with.

14. The District agrees to comply with all applicable provisions of the Federal Water Pollution Control Act, as amended and regulations promulgated thereunder, including 40 CFR Parts 35 and 403, and Indiana statutes relating to pollution abatement. Further, the District will implement any requirements of the U.S. Environmental Protection Agency with respect to conditions and limitations of grants sought by Town that are applicable to the District and being within the jurisdiction of Town.

15. The parties agree that in the event any provision of this Agreement is declared unacceptable or unenforceable by any agency exercising its appropriate authority, the remainder of the Agreement shall remain in full force and effect and the failing provisions(s) shall be amended by good faith negotiations between the parties to cure any such defect.

16. Resolution of Disagreements.

a. The parties recognize that this Agreement puts into operation a user charge system and pollutant volume and loading restrictions, the application and results of which can be determined only by experience. The parties hereby agree that if either party believes the effect of this Agreement in any way is inequitable or unfair to its citizens, such party may by thirty (30) days written notice, request re-negotiation of any part of this Agreement and the other party will in good faith participate in such negotiations.

If the parties are unable to solve their problems by negotiations, each party shall within thirty (30) days after said negotiations fail, name an independent engineer, accountant, or other person not connected with either party, who has knowledge in the disputed areas. The two named arbitrators shall name a third person to serve and the three arbitrators shall determine the unresolved issues between the parties. The judgment or findings of a majority of the arbitrators shall be binding upon the parties and a final determination of all unresolved issues.

During this period of re-negotiation and/or arbitration, the District shall continue to meet its financial obligations to Town in accordance with the provisions of this Agreement, and Town shall continue to accept and treat the District's sewage.

The expense of such arbitration shall be borne jointly and equally by the disputing parties. It is the intent of the parties hereto that any arbitrator selected pursuant hereto shall have experience and expertise in the particular area of disagreement.

b. Notwithstanding Paragraph 16(a), all disputes regarding charges computed under Paragraph 11 shall be resolved ultimately by (i) a Court of competent jurisdiction or, (ii) if the parties mutually agree, by arbitration pursuant to Paragraph 16(a) thereof.

c. The Town shall give the District ninety (90) days advance written notice of any proposed increase in the costs described in Paragraph 11(a) and 11(b) hereof to afford the District an opportunity to review and either accept or dispute such proposed increase. It is expressly understood and agreed that Town shall have the right to proceed with such rate increase even if disputed by the District and that the District shall be required to continue its payment obligations to Town, including the charges arising out of the disputed rate increase, until such dispute is resolved in accordance with the terms of this paragraph. In the event that such dispute is ultimately resolved in the District's favor, then the disputed payments previously made to Town shall be refunded within fifteen (15) days to the District by Town, together with interest at a rate equal to the maximum Indiana Revolving Loan Fund rate in effect at the time of resolution of such dispute.

17. This Agreement shall become effective on the date executed by the parties and shall continue for a period of twenty (20) years thereafter or until all bonds issued by the Town to finance the construction of its new wastewater treatment facility are paid in full, whichever period is longer.

18. This Agreement shall continue in full force and effect for two (2) additional five (5) year terms after the initial twenty (20) year term subject to the same terms and conditions, unless either of the parties thereto shall notify the other in writing of intention to terminate the same at least twenty-four (24) months prior to the expiration of the original term or any additional five (5) year terms. The parties may then desire to renegotiate the terms hereof by reason of governmental changes or requirements, changes in physical conditions, rates, costs or expenses of any kind applicable within the twenty-four (24) month period prior to the expiration of the original term or additional term. Any such renegotiation shall reflect, in good faith, changes in terms and conditions based on the reasons hereinabove set forth.

19. The parties agree that the planning area for the District is reflected upon the map attached hereto as Exhibit "D" and may be changed by agreement of the parties.

20. At such time as the Town's wastewater treatment facility has been constructed and becomes operational and accepts sewage from the District, all prior contracts and agreements between the Town and the District shall become null and void. It is the intent of the parties that this Agreement supercede all prior agreements between the Town and the District.

21. This Agreement is expressly made binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties have hereunto executed this Agreement effective this ____ day of May, 2011.

TOWN OF CHESTERFIELD, INDIANA

TOWN COUNCIL

____
RON BRANHAM, President

____
LYNETTE CARTER, Member

____
MIKE RETHERFORD, Member

____
JACK TAYLOR, Member

____
KAREN WILSON, Member

DELAWARE COUNTY REGIONAL WASTEWATER DISTRICT

____

____

____

____

____

ATTEST:

Candy S. Bennett
CANDY BENNETT, Clerk-Treasurer

ATTEST:

____

Prepared by:

WILLIAM C. KREEGAR
Attorney for Town of Chesterfield
1424 East 8th Street
Anderson, Indiana 46012
Telephone: (765) 644-8873

Approved by:

MARK L. ABRELL
Attorney for Delaware County
Regional Wastewater District
119 North High Street
Muncie, Indiana 47305
Telephone (765) 289-2469

Appendix E

TIFF Memo

Environmental Engineers & Consultants 7256 Company Drive

MEMORANDUM

Indianapolis, IN 46237
PH : (317) 888-1177 FAX: (317) 887-8641

TO: Tom Roberts

FROM: Sherri Bell

APPROVED BY: Al Stong, P.E.

DATE: February 14, 2014

SUBJECT: DCRWD Sewer Utility within Daleville Corporate Limits
Valuation & Financing Analysis **-** Summarized

The Town of Daleville (Town) is considering the possible acquisition of sanitary sewer assets currently owned and operated by the Delaware County Regional Wastewater District (DCRWD). The Town's service area is comprised of approximately 2 square miles generally located in southwest Delaware County. The assets of DCRWD within the Town's corporate limits include facilities for the provision of wastewater collection services from new developments, numerous older residential subdivisions, and several light industries.

Table 1 - Inventory / Owner Provided Value Fixed Asset Valuation Based Upon StraightLine Depreciation (Table 5 from Commonwealth Engineer's (Commonwealth) final draft report dated December 2013) presents information regarding the collection system within the Town's corporate limits, namely:

- Total Estimated Value if Constructed New: $7,089,786
- 2013 Depreciated Value: $3,974,094
- Estimated Value of Existing System $3,115,696*

Note: The Estimated Value of the Existing System is the Total Estimated Value if constructed new less the 2013 Depreciated Value. This is assuming the asset is in good condition.

Exhibit A shows the incumbent 2014 TIF (Tax Increment Financing) debt service letter from DCRWD's attorney to the Delaware County Redevelopment Commission. This TIF subsidy reduces the typical user's monthly rate by approximately $13.52 per customer and is effective for 20-years.

Table 2 – Daleville Customer Base Rate Costs summarizes both Daleville's monthly and yearly costs to convey sewage through DCRWD's collection system that lies within Daleville's corporate boundaries to Chesterfield's wastewater treatment plant for processing.

Table 3 – Loan Evaluations provides hypothetical scenarios for customer rates for a range of interest rates and loan durations. For sake of simplicity, we applied rules typically attributed to two (2) common funding programs; United States Department of Agriculture (USDA) and the State Revolving Loan Fund (SRF).

TABLE 1 - INVENTORY / OWNER PROVIDED VALUE
FIXED ASSET VALUATION BASED UPON STRAIGHT-LINE DEPRECIATION

Item Description	Unit	Quantity (ft.)	Total Est. Value (New Construction)	Depreciated Value (Dec 2013)
8" Diameter Gravity Sanitary Sewer	L.F.	50,364	$4,535,278	$2,660,848
10" Diameter Gravity Sanitary Sewer	L.F.	4,395	$ 443,895	$ 260,433
12" Diameter Gravity Sanitary Sewer	L.F.	5,599	$ 357,944	$ 210,006
6" and 8" Siphon Piping in 36" Bored Casing Beneath I-69	L.F.	411	$ 164,400	$ 96,453
Total Sanitary Sewer:	L.F.	60,769		
4" Sanitary Force Main	L.F.	5,200	$ 260,000	$ 152,542
Sanitary Lift Stations	EA.	4	$ 625,000	$ 312,500
Sanitary Manholes	EA.	189	$ 703,269	$ 281,308
TOTALS:			**$ 7,089,786**	**$ 3,974,090**

TABLE 2 – DALEVILLE CUSTOMER BASE RATE COSTS

Daleville Customer Category	Number of Customers per Category	DCRWD Monthly Sewer Rate per Category	Cost per Month per Category
Residential Customers	654	$47	$ 30,738
Commercial Customers	42	$85*	$ 3,570
Industrial Customers	0	$ 0	$ 0
Sewer Treatment Cost Borne By Daleville For DCRWD Services			
Monthly Total			**$ 34,308**
Yearly Total			**$ 411,696**

*Actual rates per commercial customer are dependent upon number of employees, parking spots, per $47 per 7,000 gallons used. The average value provided by Daleville was $85.34 and subsequently rounded.

TABLE 3 – LOAN EVALUATIONS

Loan Rate (%)	Length of Loan (Yrs)	Loan Amount (w/ TIFF)	Type of Loan (RD or SRF)	Customer Rate ($)	Loan Amount (w/o TIFF)	Type of Loan (RD or SRF)	Customer Rate ($)
2.5	20	$3,002,764.00	RD	$25.15	$3,115, 696.00	RD	$26.09
2.5	30	$3,002,764.00	RD	$18.75	$3,115, 696.00	RD	$19.46
2.5	40	$3,002,764.00	RD	$15.65	$3,115, 696.00	RD	$16.24
3	20	$3,002,764.00	RD	$26.32	$3,115, 696.00	RD	$27.31
3	30	$3,002,764.00	RD	$20.01	$3,115, 696.00	RD	$20.76
3	40	$3,002,764.00	RD	$16.99	$3,115, 696.00	RD	$17.63
3.5	20	$3,002,764.00	RD	$27.52	$3,115, 696.00	RD	$28.56
3.5	30	$3,002,764.00	RD	$21.31	$3,115, 696.00	RD	$22.11
3.5	40	$3,002,764.00	RD	$18.38	$3,115, 696.00	RD	$19.08
4	20	$3,002,764.00	RD	$28.76	$3,115, 696.00	RD	$29.84
4	30	$3,002,764.00	RD	$22.66	$3,115, 696.00	RD	$23.51
4	40	$3,002,764.00	RD	$19.83	$3,115, 696.00	RD	$20.58
4.5	20	$3,002,764.00	RD	$30.02	$3,115, 696.00	RD	$31.15
4.5	30	$3,002,764.00	RD	$24.05	$3,115, 696.00	RD	$24.95
4.5	40	$3,002,764.00	RD	$21.34	$3,115, 696.00	RD	$22.14
5	20	$3,002,764.00	RD	$31.32	$3,115, 696.00	RD	$32.50
5	30	$3,002,764.00	RD	$25.48	$3,115, 696.00	RD	$26.43
5	40	$3,002,764.00	RD	$22.88	$3,115, 696.00	RD	$23.74
5.5	20	$3,002,764.00	RD	$32.65	$3,115, 696.00	RD	$33.87
5.5	30	$3,002,764.00	RD	$26.95	$3,115, 696.00	RD	$27.96
5.5	40	$3,002,764.00	RD	$24.48	$3,115, 696.00	RD	$25.40
6	20	$3,002,764.00	RD	$34.00	$3,115, 696.00	RD	$35.28
6	30	$3,002,764.00	RD	$28.45	$3,115, 696.00	RD	$29.52
6	40	$3,002,764.00	RD	$26.11	$3,115, 696.00	RD	$27.09
2.5	20	$3,002,764.00	SRF	$25.58	$3,115, 696.00	SRF	$29.65
3	20	$3,002,764.00	SRF	$29.91	$3,115, 696.00	SRF	$31.03
3.5	20	$3,002,764.00	SRF	$31.28	$3,115, 696.00	SRF	$32.45

4	**20**	**$3,002,764.00**	**SRF**	**$32.68**	**$3,115, 696.00**	**SRF**	**$33.91**
4.5	**20**	**$3,002,764.00**	**SRF**	**$34.12**	**$3,115, 696.00**	**SRF**	**$35.40**
5	**20**	**$3,002,764.00**	**SRF**	**$35.59**	**$3,115, 696.00**	**SRF**	**$36.93**
5.5	**20**	**$3,002,764.00**	**SRF**	**$37.10**	**$3,115, 696.00**	**SRF**	**$38.49**
6	**20**	**$3,002,764.00**	**SRF**	**$38.64**	**$3,115,696.00**	**SRF**	**$40.09**

Referring to Table 4 below, let's look at the following rate scenarios.

Highest Customer Rate

1. Highest hypothetical rate of $40.09 from Table 3
2. 20-year SRF loan at 6% interest rate
3. Assume no TIFF allowance
4. Average residential customer rate of $47 for 654 residential customers from Table 2
5. $38 differential increase for 42 commercial customers versus residential customer rate from Table 2

This scenario would provide the Town of Daleville with a cost savings of $57,713 per year; which could be budgeted to O&M / debt reserve to maintain the same rates as are currently being paid.

Lowest Customer Rate

1. lowest hypothetical rate of $15.65 from Table 3
2. 40-year RD loan at 2.5% interest rate
3, assume TIFF allowance
4. average residential customer rate of $47 for 654 residential customers from Table 2
5. $38 differential increase for 42 commercial customers versus residential customer rate from Table 2

This scenario would provide the Town of Daleville with a cost savings of $261,835 per year; which could be budgeted to O&M / debt reserve or factored into a lower sewer rate.

TABLE 4 – POTENTIAL SAVINGS

Loan Rate (%)	Length of Loan (Yrs)	Loan Amount	Type of Loan (RD or SRF)	Customer Rate ($)	Yearly Cost ($)	Current Yearly Cost ($)	Yearly Savings ($)
2.5	**40**	**$3,002,764**	**RD**	**R $15.65**	**$122,821**	**$411,696**	**($261,835)**
				C $53.65	**$27,040**		
6	**20**	**$3,115,696**	**SRF**	**R $40.09**	**$314,626**	**$411,696**	**($57,713)**
				C $78.09	**$39,357**		

R = Residential C = Commercial

Mark L ABRELL
Attorney at Law
119 North iah St. Muncie, I 47305 phone 289-2161 fax 289-2162

January 13, 2014

Delaware County Redevelopment Commission
c/o Bradley Bookout

RE: Invoice/Claim foSiannuadt debt service on allocated share of construction of Chesterfield Sewage Plant

Dear Mr. Bookout:

On behalf of my client, the Delaware County Regional Wastewater District, please accept this letter as it's invoice/claim for it's allocated share of the annual debt service for the construction of the Chesterfield sewage treatment plant as provided for in the agreement between the Commission and the District.

The annual debt service for the project for 2014 is One Hundred Twelve Thousand Nine Hundred Thirty-Two Dollars ($112,932.00). Please make the check payable to the Delaware County Regional Wastewater District.

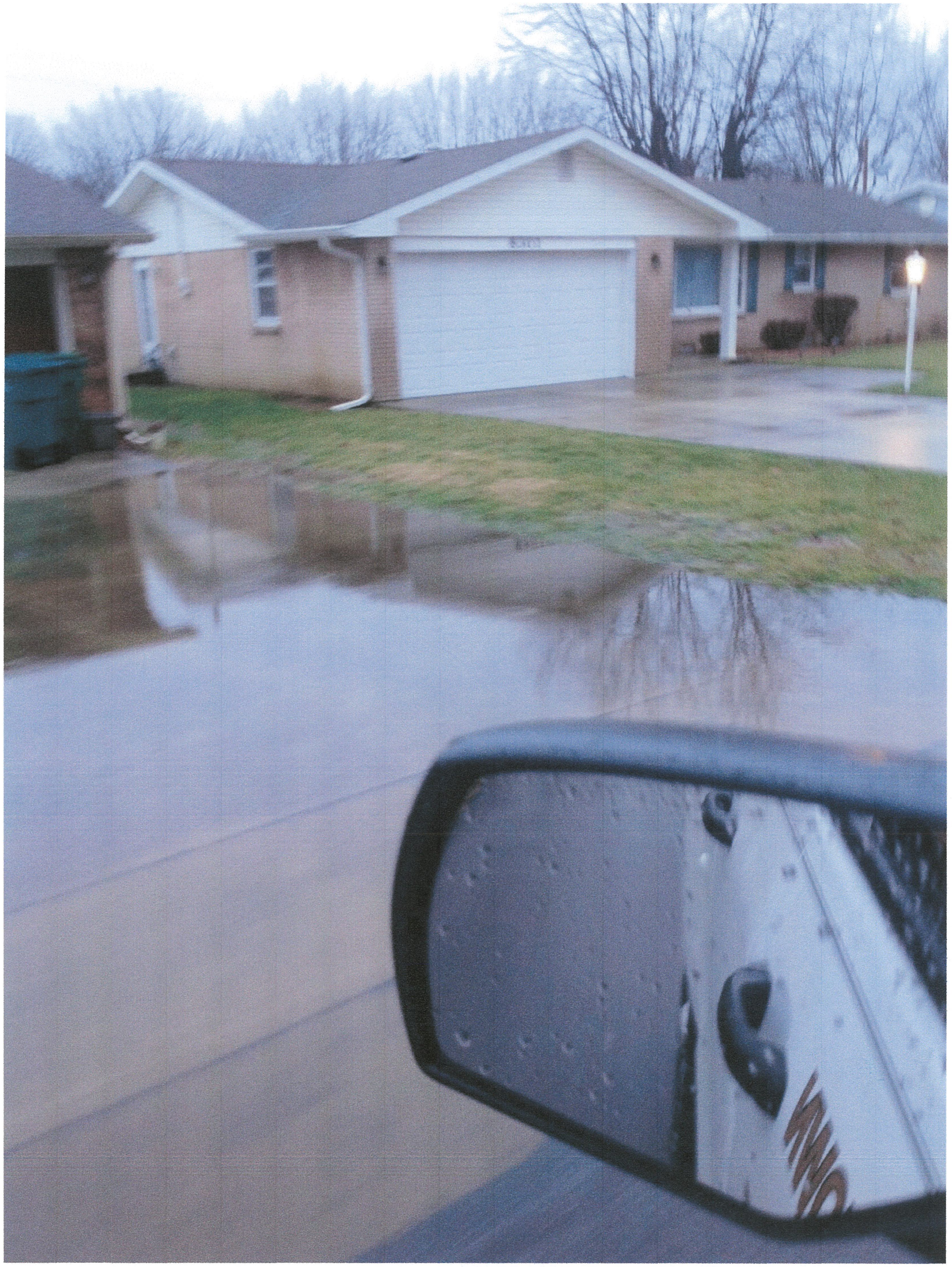
Please feel free to contact me directly if you have any questions or need any further information regarding this matter.

Mark L. Abrell
Attorney for the Delaware County
Regional Wastewater District

Appendix F

Flooding Area Photos

1



2

3

4

(5)

POND @ BASEBALL FIELDS

POND NOT HOLDING WATER

⑥

6

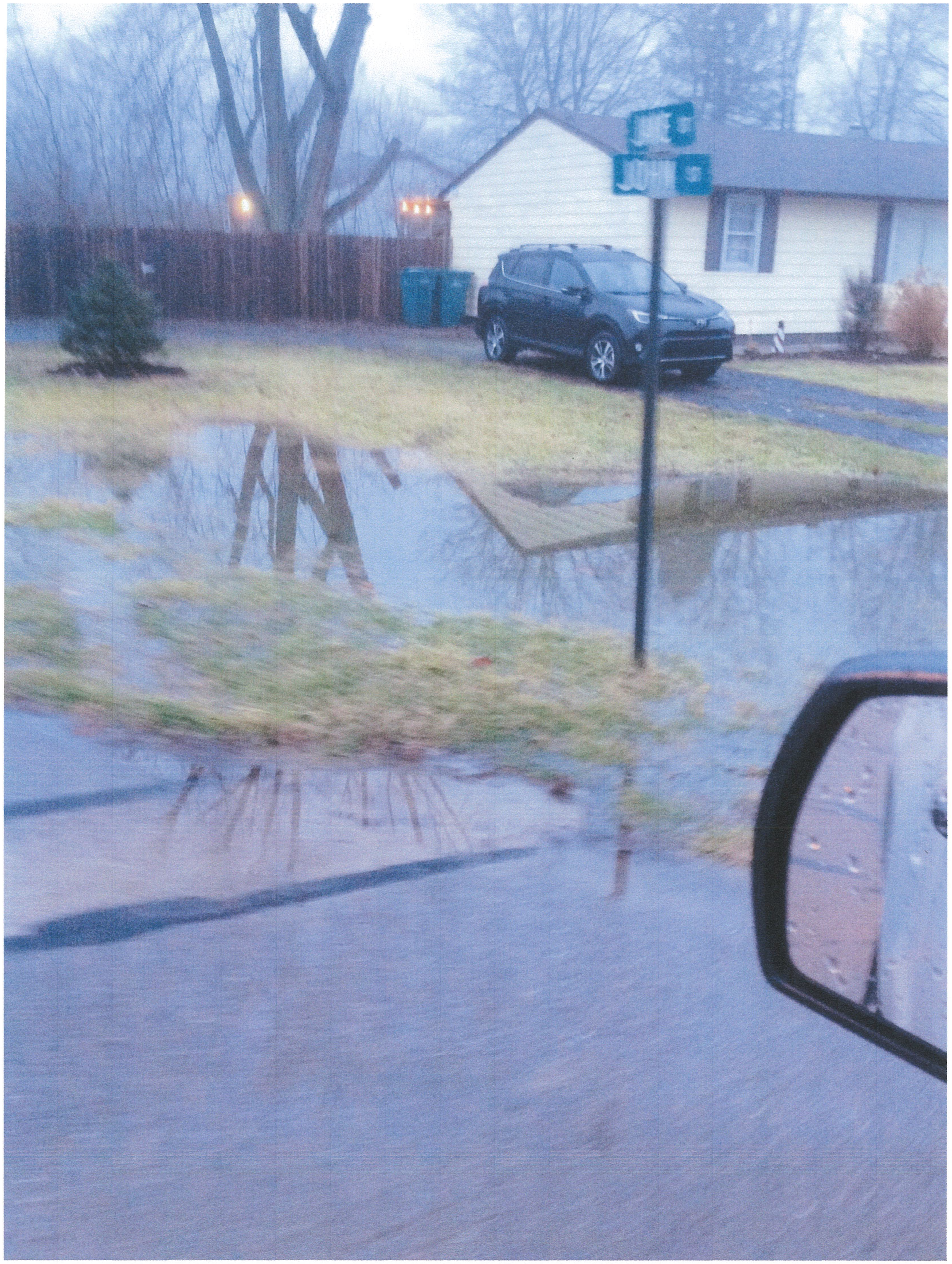
7

7

6

8

9



⑨

ACROSS ST.

(10)

(11)

11

11

11

11

11

11

(12)

Appendix G

GPR Checklist

STATE REVOLVING FUND LOAN PROGRAM

GREEN PROJECT RESERVE SUSTAINABILITY INCENTIVE

CLEAN WATER CHECKLIST

SRF Loan Program Participant Information

Participant Name: Town of Daleville

Project Name/Location: Wastewater and Stormwater Utility Improvements

Date: June 14, 2019 Revision No. 0

Instructions

This checklist shall be completed by the SRF Loan Program participant and be updated as the project changes from concept to design through construction completion. For instance, a checklist should be submitted with:

1. The SRF Loan Program Application,
2. The Preliminary Engineering Report, along with GPR project description and cost estimates,
3. The Post-Bid Documents, including GPR construction costs, and
4. Construction completion.

Please see the *U.S. EPA Green Project Reserve Guidance* available at www.srf.in.gov for a detailed review of eligibility, definition of the GPR categories: Green Infrastructure, Water Efficiency, Energy Efficiency and Environmentally innovative; examples of ineligible projects; categorical projects and those that require business cases. **All GPR projects, components and activities must be eligible for SRF funding.**

Check all that apply to the project:

I. GREEN INFRASTRUCTURE

1. Categorical Projects
   - ☒ Implementation of green streets (combinations of green infrastructure practices in transportation rights-of-way), for either new development, redevelopment or retrofits including:
     - ☐ Permeable pavement,
     - ☒ Bioretention,
     - ☐ Trees,
     - ☐ Green roofs, and
     - ☐ Other practices such as constructed wetlands that can be designed to mimic natural hydrology and reduce effective imperviousness at one or more scales, and
     - ☐ Vactor trucks and other capital equipment necessary to maintain green infrastructure projects.
   - ☐ Wet weather management systems for parking areas including:
     - ☐ Permeable pavement,
     - ☐ Bioretention,
     - ☐ Trees,
     - ☐ Green roofs, and
     - ☐ Other practices such as constructed wetlands that can be designed to mimic natural hydrology and reduce effective imperviousness at one or more scales.

    - ☐ Vactor trucks and other capital equipment necessary to maintain green infrastructure projects.
- ☐ Implementation of comprehensive street tree or urban forestry programs, including expansion of tree boxes to manage additional stormwater and enhance tree health.
- ☐ Stormwater harvesting and reuse projects, such as cisterns and the systems that allow for utilization of harvested stormwater, including pipes to distribute stormwater for reuse.
- ☐ Downspout disconnection to remove stormwater from
    - ☐ Sanitary,
    - ☐ Combined sewers, and
    - ☐ Separate storm sewers and manage runoff onsite.
- ☐ Comprehensive retrofit programs designed to keep wet weather discharges out of all types of sewer systems using green infrastructure technologies and approaches such as:
    - ☐ Green roofs,
    - ☐ Green walls,
    - ☐ Trees and urban reforestation,
    - ☐ Permeable pavements
    - ☐ Bioretention cells, and
    - ☐ Turf removal and replacement with native vegetation or trees that improve permeability.
- ☐ Establishment or restoration of:
    - ☐ Permanent riparian buffers,
    - ☐ Floodplains,
    - ☐ Wetlands (federal rules prevent the SRF Loan Programs from providing financing assistance for a wetland required as a mitigation measure)
    - ☐ Vegetated buffers or soft bioengineered stream banks
    - ☐ Stream day lighting that removes natural streams from artificial pipes and restores a natural stream morphology that is capable of accommodating a range of hydrologic conditions while also providing biological integrity.
- ☐ Projects that involve the management of wetlands to improve water quality and/or support green infrastructure efforts (e.g., flood attenuation).
    - ☐ Includes constructed wetlands.
    - ☐ May include natural or restored wetlands if the wetland and its multiple functions are not degraded and all permit requirements are met.
- ☐ The water quality portion of projects that employ development and redevelopment practices that preserve or restore site hydrologic processes through sustainable landscaping and site design.
- ☐ Fee simple purchase of land or easements on land that has a direct benefit to water quality, such as riparian and wetland protection or restoration.

2. Decision Criteria for Business Cases
    - ☐ Green infrastructure projects that are designed to mimic the natural hydrologic conditions of the site or watershed.
    - ☐ Projects that capture, treat, infiltrate, or evapotranspire water on the parcels where it falls and does not result in interbasin transfers of water.
    - ☐ GPR project is in lieu of or to supplement municipal hard/gray infrastructure.
    - ☐ Other - Please provide an attachment explaining the scope of the project and brief explanation of the approach for the business case.

3. Example of Project Requiring a Business Case
    - ☐ Fencing to keep livestock out of streams and stream buffers. Fencing must allow buffer vegetation to grow undisturbed and be placed a sufficient distance from the riparian edge for the buffer to function as a filter for sediment, nutrients and other pollutants.

II. WATER EFFICIENCY

1. Categorical Projects
    - ☐ Installing or retrofitting water efficient devices, such as plumbing fixtures and appliances.
        - ☐ For example, shower heads, toilets, urinals and other plumbing devices.
        - ☐ Implementation of incentive programs to conserve water such as rebates.
        - ☐ Water sense labeled products.
    - ☐ Installing any type of water meter in previously unmetered areas, if rate structures are based on metered use
        - ☐ Can include backflow prevention devices if installed in conjunction with water meter
    - ☐ Replacing existing broken/malfunctioning water meters, or upgrading existing meters, with:
        - ☐ Automatic meter reading systems (AMR), for example:
            - ☐ Advanced metering infrastructure (AMI),
            - ☐ Smart meters,
        - ☐ Meters with built in leak detection,
        - ☐ Can include backflow prevention devices if installed in conjunction with water meter replacement.
    - ☐ Retrofitting/adding AMR capabilities or leak detection equipment to existing meters (not replacing the meter itself).
    - ☐ Water audit and water conservation plans, which are reasonably expected to result in a capital project.
    - ☐ Recycling and water reuse projects that replace potable sources with non-potable sources:
        - ☐ Gray water, condensate and wastewater effluent reuse systems (where local codes allow the practice),
        - ☐ Extra treatment costs and distribution pipes associated with water reuse.
    - ☐ Retrofit or replacement of existing landscape irrigation systems to more efficient landscape irrigation systems, including moisture and rain sensing controllers.
    - ☐ Retrofit or replacement of existing agricultural irrigation systems to more efficient agricultural irrigation systems.

2. Decision Criteria for Business Cases
    - ☐ Water efficiency can be accomplished through water saving elements or reducing water consumption. This will reduce the amount of water taken out of rivers, lakes, streams, groundwater, or from other sources.
    - ☐ Water efficiency projects should deliver equal or better services with less net water use as compared to traditional or standard technologies and practices.
    - ☐ Efficient water use often has the added benefit of reducing the amount of energy required by a POTW, since less water would need to be collected and treated; therefore, there are also energy and financial savings.
    - ☐ Other - Please provide and attachment explaining the scope of the project and brief explanation of the approach for the business case.

3. Example Projects Requiring a Business Case
    - ☐ Water meter replacement with traditional water meters.
    - ☐ Projects that result from a water audit or water conservation plan.
    - ☐ Storage tank replacement/rehabilitation to reduce loss of reclaimed water.
    - ☐ New water efficient landscape irrigation system.
    - ☐ New water efficient agricultural irrigation system.

III. ENERGY EFFICIENCY

1. Categorical Projects
   - ☐ Renewable energy projects such as wind, solar, geothermal, micro-hydroelectric, and biogas combined heat and power systems that provide power to a POTW. Micro-hydroelectric projects involve capturing the energy from pipe flow.
     - ☐ POTW owned renewable energy projects can be located onsite or offsite.
     - ☐ Include the portion of a publicly owned renewable energy project that POTW's energy needs.
     - ☐ Must feed into grid system that the utility draws from and/or there is a direction connection.
   - ☐ POTW energy management planning, including energy assessments, energy audits, optimization studies, and sub-metering of individual processes to determine high energy use areas, which are reasonably expected to result in a capital project are eligible.
   - ☐ Projects that achieve a 20% reduction in energy consumption are categorically eligible for GPR. If a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case.
   - ☐ Collection system Infiltration/Inflow detection equipment.

2. Decision Criteria for Business Cases
   - ☐ Project must be cost effective. An evaluation must identify energy savings and payback on capital and operation and maintenance costs that does not exceed the useful life of the asset.
   - ☐ The business case must describe how the project maximizes energy saving opportunities for the POTW or unit process.
   - ☐ Using existing tools such as Energy Star's Portfolio Manager (http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) or Check Up Program for Small Systems (CUPSS) (http://www.epa/cupss) to document current energy usage and track anticipated savings.
   - ☐ Other - Please provide and attachment explaining the scope of the project and brief explanation of the approach for the business case.

3. Examples of Projects Requiring a Business Case
   - ☐ POTW projects or unit process projects that achieve less than a 20% energy efficiency improvement may be justified using a business case.
   - ☐ Projects implementing recommendations from an energy audit that are not otherwise designated as categorical.
   - ☐ Projects that cost effectively eliminate pumps or pumping stations.
   - ☐ Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective.
     - ☐ Projects that count toward GPR cannot build new structural capacity. These projects may, however, recover existing capacity by reducing flow from I/I.
   - ☐ I/I correction projects where excessive groundwater infiltration is contaminating the influent requiring otherwise unnecessary treatment processes (i.e. arsenic laden groundwater) and I/I correction is cost effective.
   - ☐ Replacing pre-Energy Policy Act of 1992 motors with National Electric Manufacturers Association (NEMA) premium energy efficiency motors.
     - ☐ NEMA is a standards setting association for the electrical manufacturing industry (http://www.nema.org/gov/energy/efficiency/premium/).
   - ☐ Upgrade of POTW lighting to energy efficient sources (such as metal halide pulse start technologies, compact fluorescent, light emitting diode (LED)).
   - ☐ SCADA systems can be justified based upon substantial energy savings.
   - ☐ Variable Frequency Drive can be justified based upon substantial energy savings.

IV. ENVIRONMENTALLY INNOVATIVE

1. Categorical Projects
   - ☐ Total/integrated water resources management planning likely to result in a capital project.
   - ☐ Utility Sustainability Plan consistent with EPA's SRF sustainability policy.
   - ☐ Greenhouse gas (GHG) inventory or mitigation plan and submission of a GHG inventory to a registry (such as Climate Leaders or Climate Registry).
   - ☐ Planning activities by a POTW to prepare for adaptation to the long-term effects of climate change and/or extreme weather.
   - ☐ Construction of US Building Council LEED certified buildings or renovation of an existing building on POTW facilities.
   - ☐ Decentralized wastewater treatment solutions to existing deficient or failing onsite wastewater systems.

2. Decision Criteria for Business Cases
   - ☐ Technology or approach whose performance is expected to address water quality but the actual performance has not been demonstrated in the state;
   - ☐ Technology or approach that is not widely used in the state, but does perform as well or better than conventional technology/approaches at lower cost; or
   - ☐ Conventional technology or approaches that are used in a new application in the state.
   - ☐ Other - Please provide and attachment explaining the scope of the project and brief explanation of the approach for the business case.

3. Examples of Projects Requiring a Business Case
   - ☐ Constructed wetlands projects used for municipal wastewater treatment, polishing, and/or effluent disposal.
     - ☐ Natural wetlands.
     - ☐ Project may not further degrade.
   - ☐ Projects or components of projects that result from total/integrated water resource management planning consistent with the decision criteria for environmentally innovative projects and that are Clean Water SRF eligible.
   - ☐ Projects that facilitate adaptation of POTWs to climate change identified by a carbon footprint assessment or climate adaptation study.
   - ☐ POTW upgrades or retrofits that remove phosphorus for beneficial use, such as biofuel production with algae.
   - ☐ Application of innovative treatment technologies or systems that improve environmental conditions and are consistent with the Decision Criteria for environmentally innovative projects such as:
     - ☐ Projects that significantly reduce or eliminate the use of chemicals in wastewater treatment.
     - ☐ Treatment technologies or approaches that significantly reduce the volume of residuals, minimize the generation of residuals, or lower the amount of chemicals in the residuals.
       - ☐ Includes composting, Class A and other sustainable biosolids management approaches.
   - ☐ Educational activities and demonstration projects for water or energy efficiency.
   - ☐ Projects that achieve the goals/objectives of utility asset management plans.
   - ☐ Sub-surface land application of effluent and other means for ground water recharge, such as spray irrigation and overland flow.
     - ☐ Spray irrigation and overland flow of effluent is not eligible for GPR where there is no other cost effective alternative.

V. CLIMATE AND EXTREME WEATHER RESILIENCY

1. Categorical Projects – none at this time.

2. Decision Criteria for Business Cases

- ☐ Utility functions and performance can be disrupted by climate change/extreme weather events.
  - ☐ Flooding
  - ☐ Drought
  - ☐ Tornado
  - ☐ Lightning strikes
  - ☐ Earthquake
- ☐ Incorporate project elements that provide flexibility to adapt operations and functionality as external conditions change over time.
- ☐ Project components designed to perform beyond the minimum Building Code or Design Standards.
- ☐ Utilize climate resiliency and adaptation strategies when siting or routing key project structures or components.
- ☐ Ability to modify or expand proposed facilities based on future climate change issues.
- ☐ Other - Please provide and attachment explaining the scope of the project and brief explanation of any aspects in the planning, construction or operation phase that support the approach for the business case.

3. Examples of Projects Requiring a Business Case

- ☐ Utilizing natural, native and drought resistant planted elements that are economically replaced at project sites for storm water control or landscaping.
- ☐ Siting new structures away from flash flood areas or poor structural soils in former waterway areas.
- ☐ Consideration of finished floor elevation above the 100 year flood elevation or normal code requirements.
- ☐ Increasing structural, roof (snow) or wind loadings beyond code requirements for new structures.
- ☐ Incorporate passive cooling systems for instrumentation, control or power panel rooms subject to high heat conditions.

Appendix H

Financing Information

APPENDIX H

SRF PROJECT FINANCING INFORMATION

(Wastewater)

1. Project Cost Summary

   a. Collection/Transport System Cost $1,091,400

   b. Treatment System Cost $0

   c. Non-Point Source (NPS) cost (septic tank removal) $0

   Subtotal Construction Cost $1,091,400

   d. Capacity Reservation Fees $0

   e. Contingencies $109,200

   (should not exceed 10% of construction cost)

   f. Non-Construction Cost $310,200

   e.g., engineering/design services, field exploration studies, project management & construction inspection, legal & administrative services, land costs (including capitablized costs of leased lands, ROWs, & easements), start-up costs (e.g., O&M manual, operator training).

   g. **Total Project Cost** (lines a+b+c+d+e+f) $1,510,800

   h. Total ineligible SRF costs* (see next page) $0

   Total ineligible SRF costs will not be covered by the SRF loan.

   i. Other funding sources (list other grant/loan sources & amounts)

      (1) Local Funds (hook-on fees, connection fees, capacity fees, etc.)

      $250,800

      (2) Cash on hand ______

      (3) Community Development Block Grant – Community Focus Fund (CFF)

      ______

      (4) US Dept of Agriculture Rural Development (RD)

      (5) Other ______

   Total Other Funding Sources $250,800

2. **SRF Loan Amount** line g minus line item h+i*) $1,260,000

   *If there are adequate funds available under (i) to cover (h) then subtract (i) only

.

3. Financial Advisor
   a. Firm Baker Tilly Municipal Advisors
   b. Name Deen Rogers
   c. Phone Number (317) 465-1538

4. Bond Counsel
   a. Firm Barnes and Thornburg
   b. Name Kim Blanchet
   c. Phone Number (317) 231-7454

The following costs are *not eligible* for SRF reimbursement:

1. Land cost (*unless it's for sludge application*) $__________

   Only the actual cost of the land is **not eligible**; associated costs (such as attorney's fees, site title opinion and the like) **are eligible**.

2. Materials & work done on private property $__________

   (*Installation/repair of laterals, including disconnection of inflow into laterals; abandonment of on-site systems [septic tank or mound systems]).* Grinder pumps, vacuum stations and other appurtenances/installations on private property to treat/transport ARE fundable IF owned and maintained by the participant.

3. Grant applications and income surveys done for other agencies (e.g., OCRA, RUS, etc.)

   $__________

4. Any project solely designed to promote economic development and growth is ineligible.

5. Costs incurred for preparing NPDES permit applications and other tasks unrelated to the SRF project.

   $__________

6. Cleaning of equipment, such as digesters, sand filters, grit tanks and settling tanks. These items should have been maintained through routine operation, maintenance and replacement by the political subdivision. Sewer cleaning is **ineligible** for SRF *unless* the cleaning is required for sewer rehabilitation such as sliplining and cured in place piping (CIPP)

   $__________