Report

2017 North Vernon Wastewater Service

Preliminary Engineering Report

City of
North Vernon, Indiana

March 2017

Prepared by
RLM Engineering

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

PREFACE

The city of North Vernon, Indiana annexed an area adjacent to the north boundary in 2015. The area is currently served by on-site septic systems. The city proposes to install a gravity sewer collection system to remove the on-site systems and connect the area to the city's existing wastewater collection system.

On-site septic systems commonly fail in Jennings County soil due to the high clay content and tight or slow permeability. The area was previously considered for a collection system in the failed Jennings Northwest Regional Utilities project. The area is no longer in the JNRU jurisdiction.

The proposed project intends to remove approximately 133 on-site septic systems with the connection to the City's facility. Run off in the area flows into ditches and into six mile creek. Six mile creek is the source flowing into Country Squire Lake used for the Country Squire Lakes' development, esthetics, and recreation purposes. Removal of the onsite septic systems should benefit the areas environment.

The existing waste water collection system has adequate capacity to transport the wastewater from the proposed area to the existing facility. The existing treatment facility also has the capacity to treat the addition wastewater flow.

The proposed project is estimated at $3,768,300.00 with a 20 year loan through the Indiana State Revolving Loan Fund. Other funding was reviewed but the current wastewater rates are relatively too low in comparison with the areas income level to receive grant funds. However, considerations are underway to pursue supplemental support or an annual pledge from the North Vernon Redevelopment Commission for a payment to the wastewater department to offset at least a portion of the increased cost. Due to this a rate impact from 0% to 12% could occur depending upon the amount of pledge received.

1.01 PROJECT

The project as planned involves providing sanitary sewer systems to an area recently annexed into the city of North Vernon. The annexed area currently uses individual on site wastewater disposal. An extension of the city's existing system will provide the area with reliable sanitary sewer collection. The infrastructure improvements will accommodate existing utility demands, and will serve the area through the 20 year service plan. The project area also includes an area outside of the city's boundary for collection system configuration reasons.

1.02 LOCATION

North Vernon is the largest city in Jennings County, and is the primary location for commercial and industrial development in the county. The US 50 bypass at North Vernon is expected to be completed in 2017 and bisects the annexation area. This area also includes SR 7 and SR 3. The city and project area is located in southeastern Indiana. Figure 1.02-1provides a general location map for the city and annexation/project area. Figure 1.02-2 will give a closer view of the project location. The study area lies in Jennings County within portions of section 21 and 28 of Center Township and a part of section 20 of Geneva Township. The county is bordered by Bartholomew and Decatur Counties to the north, Jefferson and Scott Counties to the South, Ripley County to the east, and Jackson County to the west.

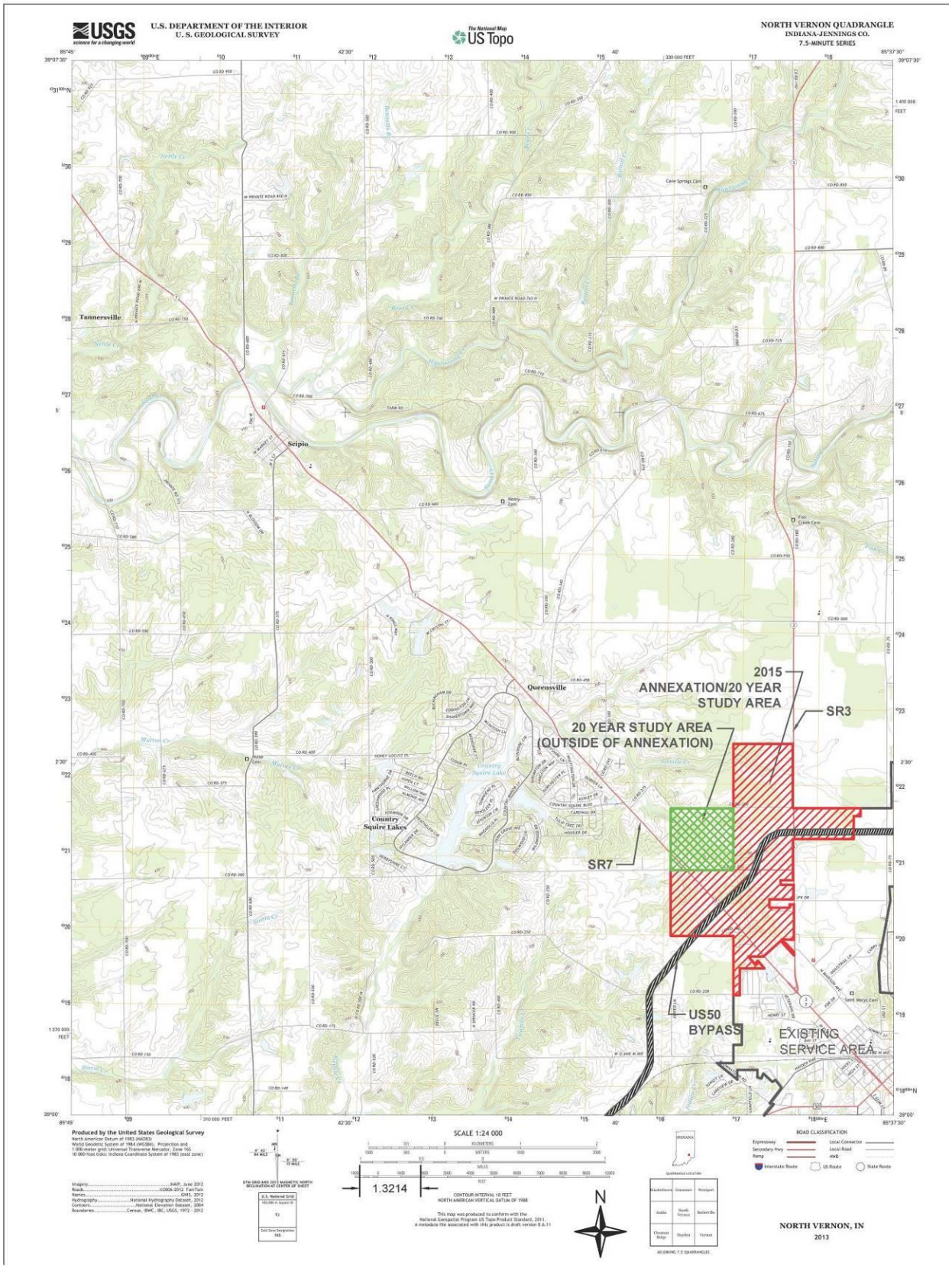


Figure 1.02-1 STUDY AREA LOCATION MAP (USGS MAP)

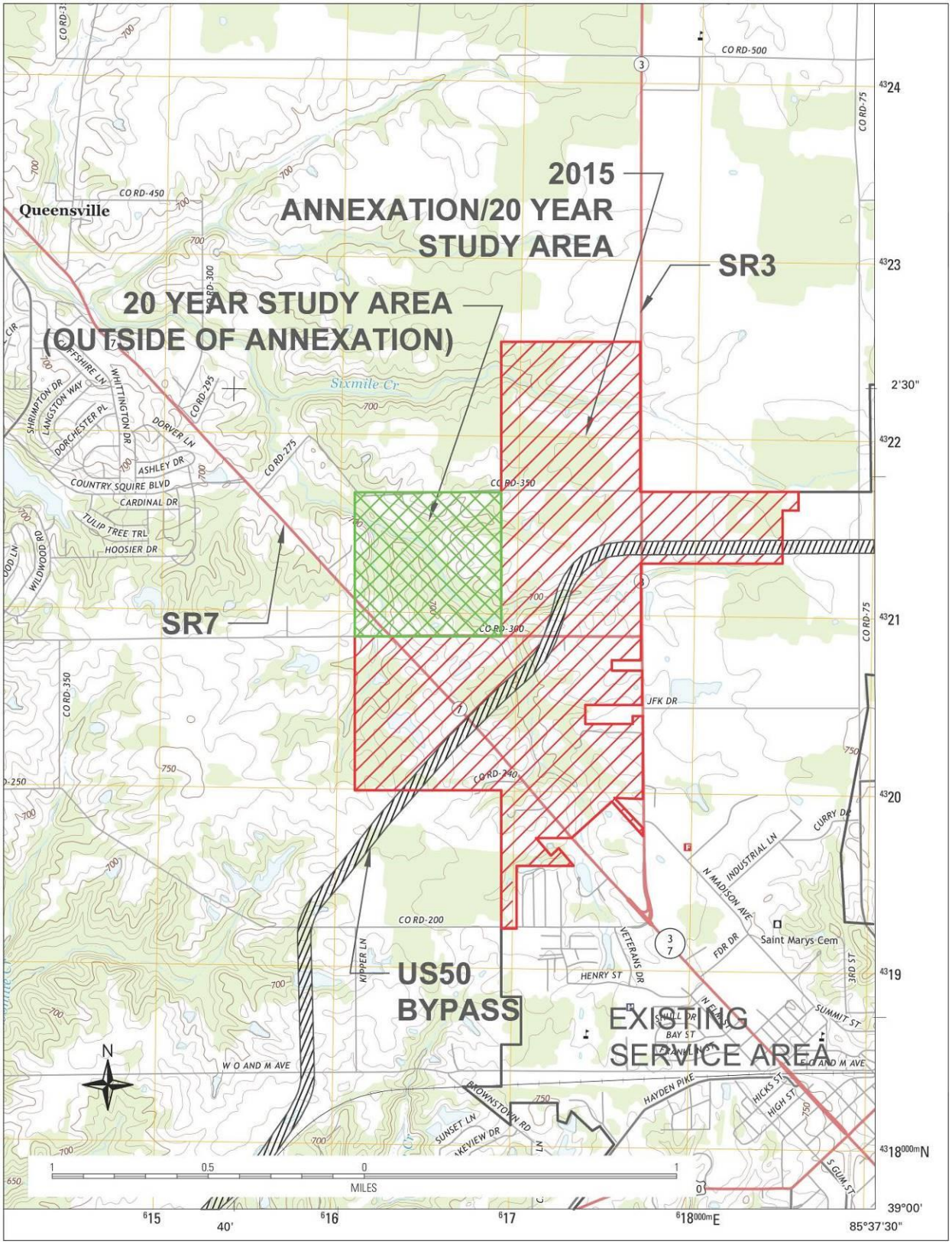


Figure 1.02-2 STUDY AREA AND ANNEXED AREA (USGS MAP)

1.03 EXISTING WASTE WATER COLLECTION SERVICE AREA

The existing service area for the city of North Vernon wastewater collection generally lies within the city limits prior to the 2015 annexation. This area can be seen, outlined, in figure 1.03-1. The city is served by a gravity sewer collection system. The city also receives wastewater from the Town of Vernon.

The City's average daily wastewater flow received at the treatment plant for 2013, 2014, and 2015 is 1.370 MGD, 1.535 MGD, and 1.326 MGD respectfully. The existing wastewater treatment facility has sufficient capacity to handle projected flow for the project area.

Improvements are underway at the wastewater treatment facility. The improvements are construction of additional treatment components for treating excess flow from the combined sewers. The improvements are a part of the Long Term Control Plan for the combined sewer overflows. These improvements are scheduled to be completed in early 2017. The wastewater treatment plant handing the city is capable of servicing an average day of 2.2 MGD and has a peak design flow of 4.76 MGD.

The existing collection system service area approximately encompasses 4,780 acres in size. With the recent average annual daily flow of 1.326 MGD being treated, the facility has the capability to treat additional wastewater flow of around .874 MGD.

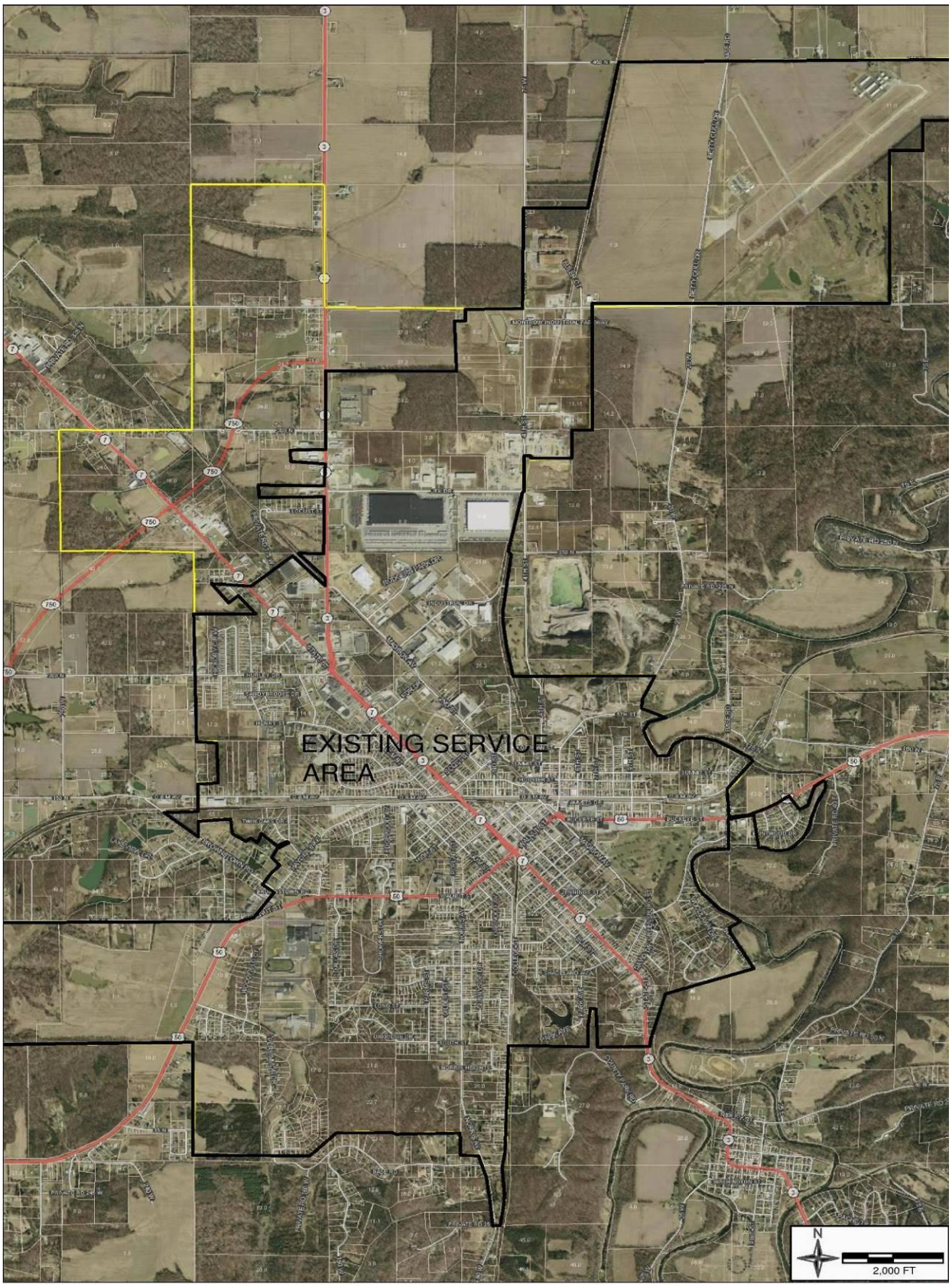


Figure 1.03 EXISTING SERVICE AREA (AERIAL PHOTO).

1.04 20-YEAR STUDY AREA

The 20-Year Study Area encompasses the annexation area of 772 acres and approximately 150 acres northwest of the annexation area due to topography. Utilizing the topography in the area outside of the annexed area could result in an overall less costly project by eliminating lift stations. Therefore it was included in the study area for consideration. In general, the 20 year study area is bounded by the annexation area and is the same size as the proposed project area. This total area encompasses approximately 922 acres and is illustrated in Figure 1.04-1.

The city of North Vernon, Indiana completed annexation of 772 acres in early 2015. The annexed area included existing county roads, SR 7, SR 3, and SR 750 (US 50 bypass). SR 750 is completed from the west side of North Vernon to SR 3. SR 750 East of SR 3 to east US 50 is under construction and is to be completed in mid-2017.

Some development is occurring in the annexed area. A proposed development at SR 7 and SR 750 is scheduled to be completed in mid-2017. A sewer extension project is underway to provide waste water service to this area. This extension is being financed with city and county tax increment financing. Another development in the area is a manufacturing facility located on SR 3 north of CR 350. The wastewater collection requirements for this facility has been financed through the city's redevelopment commission.

The cost of the wastewater collection improvements outlined above are considered separate from this PER project and are not included in the PER project cost. However both of these projects are useful in connecting the study area to the existing wastewater collection system. Coordinated planning of these wastewater collection improvements were done to minimize the cost for the remaining study improvements.

Pertinent existing wastewater components are shown on figure 1.04-2.

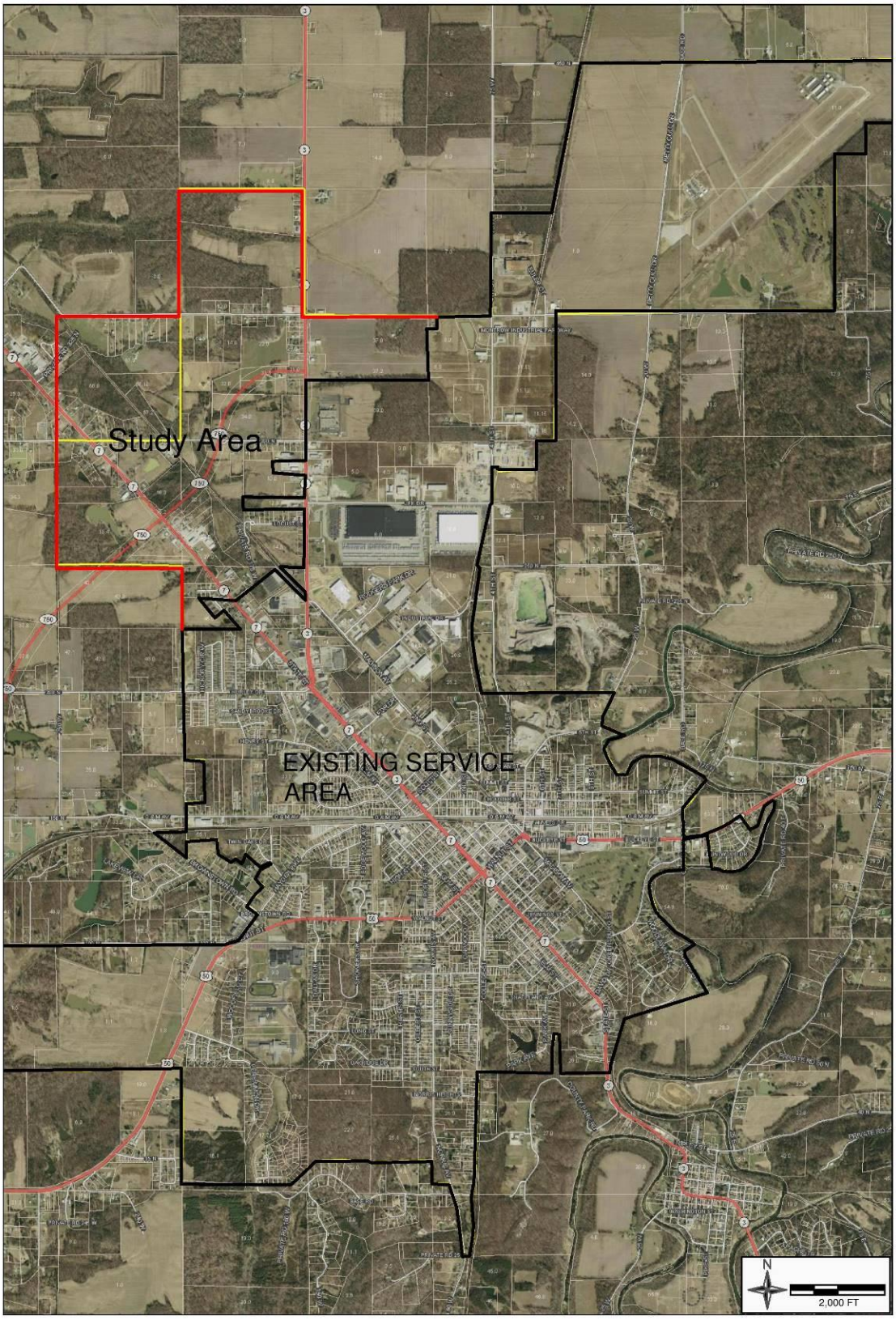


Figure 1.04-1 STUDY AREA (AERIAL MAP)

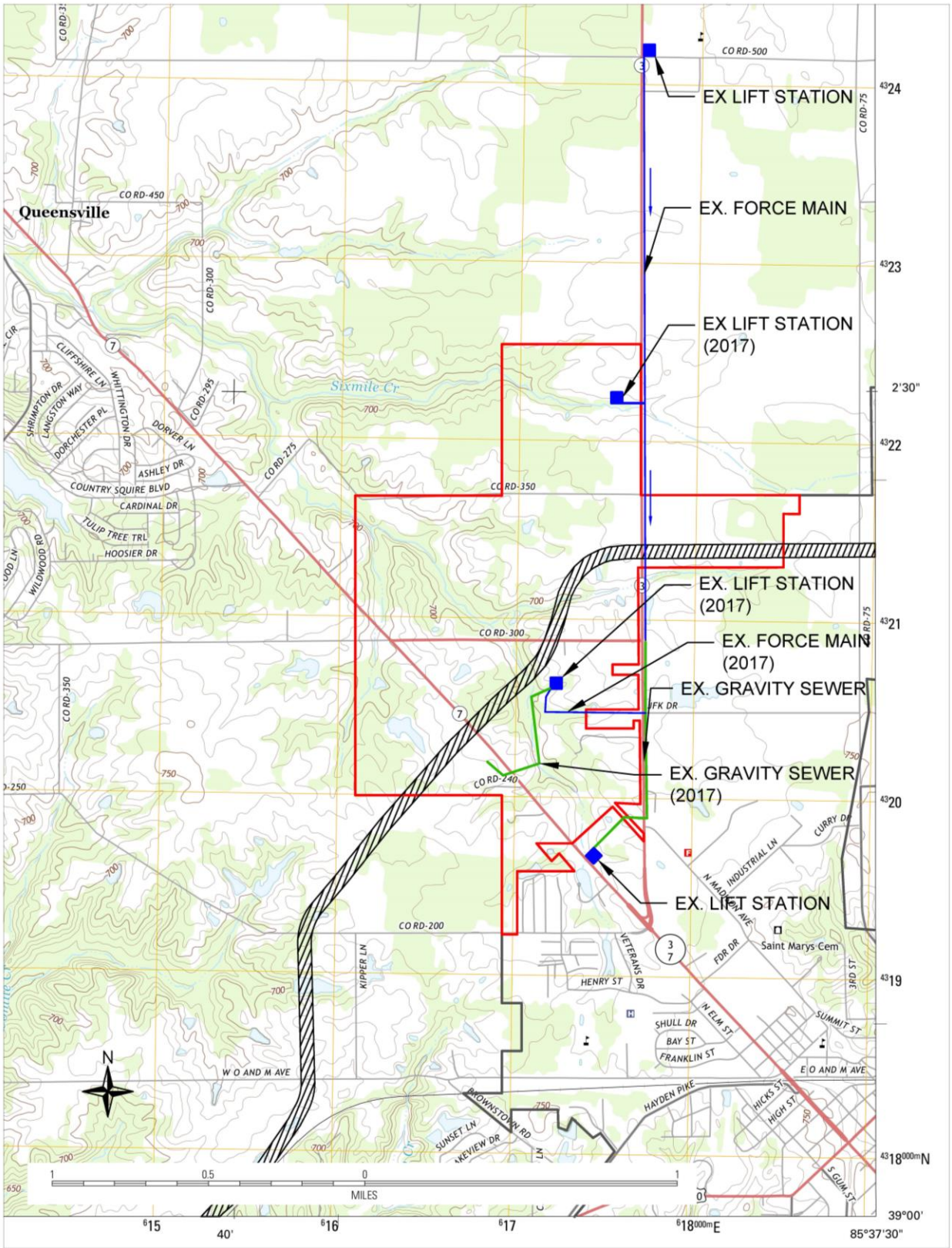


Figure 1.04-2 Existing wastewater collection components

1.05 20-YEAR SERVICE AREA

A planning period of 20-years ending in the year 2036 was used for addressing the future service area. Figure 1.04-1shows the existing service area along with the 20-year Study area. The 20 year study area and service area indicated in section 1.04 are one and the same.

1.06 PROJECT AREA

The project area is generally the area annexed by the city in 2015. In addition, a section outside of the annexed area is considered for sanitary sewer as shown on figure 1.04-1.

1.07 RIGHT OF WAY

All construction on the wastewater improvements will be in areas platted in City street right-of-way or in private easements. Easements will be obtained from property owners for the installation of gravity sewers and force main where not located in street right-of-way. The lift station site(s) will be purchased.

1.08 ABBREVIATION AND ACRONYMS

Feet	Ft
Inch	In
Square Feet	Sq. Ft
Cubic Yards	CY
Millions of Gallons Per Day	MGD
Water Treatment Plant	WTP
United States Geological Survey	USGS
Combined Sewer System	CSS
United States Department of Agriculture	USDA
Department of Natural Resources	DNR

2.01 CURRENT SITUATION

The City of North Vernon completed an annexation for a majority of the study area in 2015. As part of the conditions of the annexation, the city is required under state statute to provide certain services such as street lighting, police and fire protection refuse and leaf pickup, street cleaning and snow removal along with other utilities such as water and sewer for the annexation area.

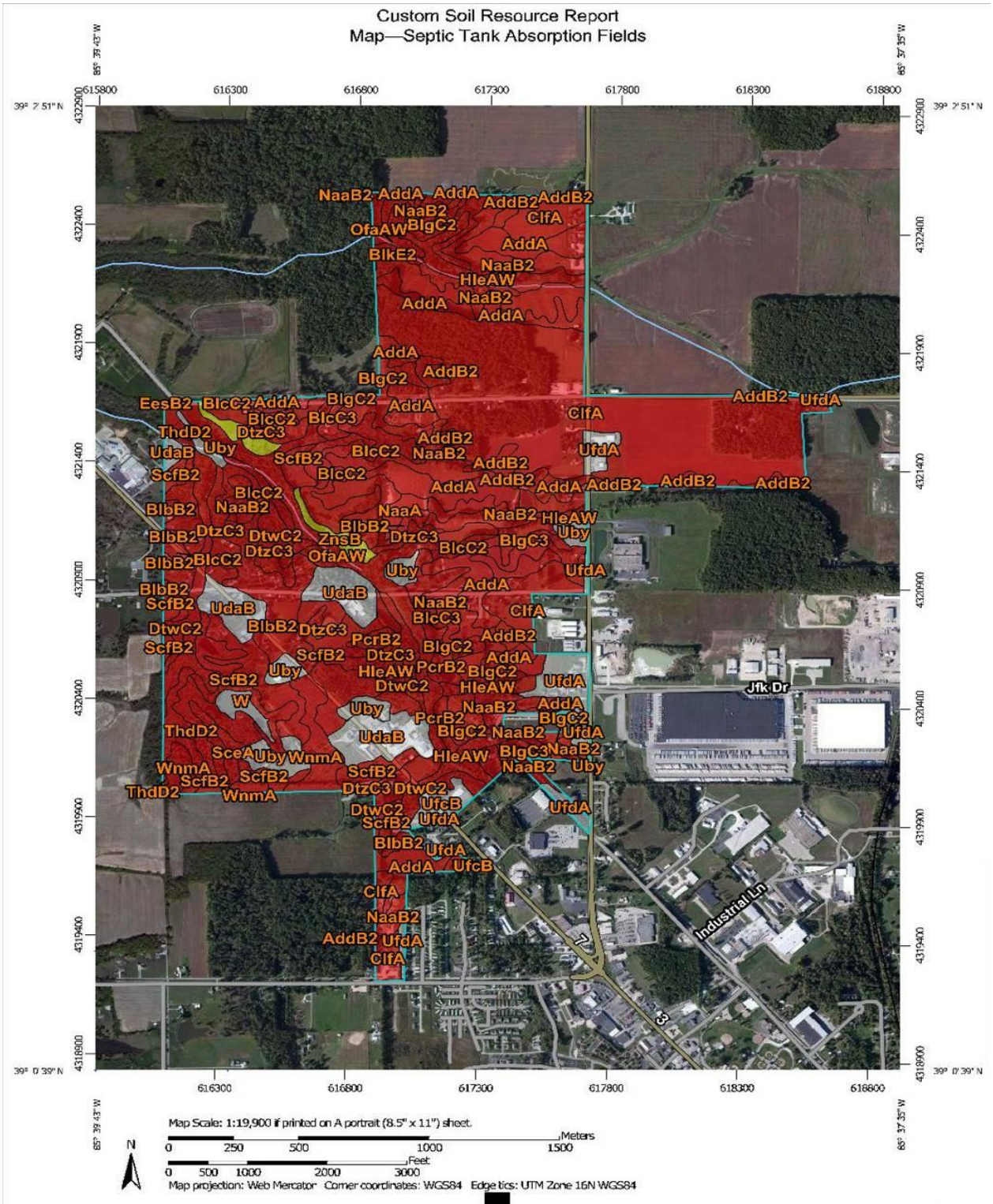
This study only considers the extension of wastewater service to the study area and is not intended to encompass other infrastructure items. For instance water service for the area is currently served by Jennings water, Inc. Also providing other services is outside of the scope of their project. The city's wastewater collection system is primarily gravity sewers. The annexation process identified that the annexed area sewers would also be primarily gravity sewers.

The proposed project area currently uses septic systems for wastewater treatment and is typically served by Jennings water for potable water service. The majority of these septic systems were installed prior to 1980. Figure 2.01 shows a soil map of the project area. The dark red areas indicate land where the effective use as septic absorptions fields are very limited.

Figure 2.01 was generated from the USDA web soil survey website, https://websoilsurvey.sc.egov.usda.gov. Soil type is extremely important for proper operation of absorption fields. Figure 2.01 indicates that nearly 90% of the study area soils are very limited for use as absorption fields. With the exception of the wastewater collection system identified on figure 1.04-2, the study area (and annexed area) uses on-site septic systems for wastewater treatment. The majority of the on-site systems were installed prior to 1980 when the dwellings etc. were constructed.

The Jennings County, Indiana Health Department was contacted and they provided a support letter for the project. Discussions with the health department indicate that systems have failed in the study area due to the soils and that some systems are inadequate. There are also on-site-systems with aerated treatment equipment that have failed and there were no or inadequate absorption fields were installed.

The annexed portion of the study area falls under the existing City's Sewer Use Ordinance. The Sewer Use Ordinance prohibits on-site septic disposal systems within the city limits. The construction of a wastewater collection system (gravity sewer) would allow the annexed area to be in compliance with the sewer use ordinance.



Septic Tank Absorption Fields— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	827.4	88.8%
Somewhat limited	9.6	1.0%
Null or Not Rated	94.7	10.2%
Totals for Area of Interest	**931.7**	**100.0%**

Figure 2.01 Soil type suitability for septic tank absorption fields.

2.02 EXISTING SYSTEM AND FACILITIES

The study area utilizes septic tank and leach field treatment systems with the exception of the two wastewater collection projects in the study area discussed previously. On-site systems are prohibited within the city's boundaries by the existing sewer use ordinance. The annexation of most the study area therefore prohibits future on-site systems. Currently, the annexation area is out of compliance with the sewer use ordinance. Additionally, any development of the area would require the connection to the city's sewer.

The City's wastewater collection system is adjacent to the study area providing potential connection points. A force main lies along the east side of SR 3 which serves the sand creek elementary school to the north. The force main discharges into a gravity sewer at the east side of SR 3 and CR 300N. The gravity sewer flows south along SR 3 and then to SR 7 to the northwest lift station.

As indicated previously, the existing wastewater treatment facility has excess capacity available to incorporate additional flow from the study area. Wastewater service to the study area would be collected and directed to the northwest lift station along SR7. All of the wastewater produced in the study would be pumped by the northwest lift station.

The North West lift station is a three pump lift station. The lift station has more than adequate capacity to serve the study area. For example the average pump run time for April 2016 was 14 hours per day and for May 2016 was 11.3 hours per day out of an available 48 hours (2 pumps with one as standby) The study area wastewater flow would likely add 1 additional hour per day.

2.03 WASTEWATER NEEDS

The city of North Vernon sewer use ordinance prohibits use of septic systems within its boundaries. Installation of sanitary sewers for the annexed area was indicated as part of the annexation process. The City of North Vernon operates a conventional gravity collection system for the vast majority of the City at present and wishes to use the same type of system to serve the annexed area. This will be the preferred option studied in section 4. Due to the varied terrain several small lift stations will be required to serve the area from the various 8 inch collection sewers. The lift stations will transfer the wastewater to downstream collection and pumping systems with the ultimate destination being the treatment plant. The existing treatment facility

has enough capacity to treat the projected flows from the annexed area.

The study area has 133 facilities potentially needing sewer service. 8” diameter sewer, the minimum allowed, provides adequate capacity for the study area. The pump station(s) will be sized appropriately for the area. The 8" diameter sewer will serve the area well into the future.

3.01 CURRENT POPULATION

The historical population data of Jennings County and Center Township which contains the annexation area was taken from STATS Indiana, an information service of the Indiana Business Research Center at Indiana University's Kelly School of Business. Table 3.01-1shows the historic population in Jennings County and Center Township over the last 60 years.

Year	Jennings County Population	Center Township Population
2010	28,525	8,894
2000	27,554	8,593
1990	23,661	7,800
1980	22,854	7,806
1970	19,454	6,844
1960	17,267	5,864
1950	15,250	4,939

Table 3.01-1 Historical Population

3.02 20-YEAR POPULATION PROJECTIONS

It is anticipated that the study area will see a slight increase in economic activity during the 20-year planning period due to limited availability of buildable lots in the district. The STATS Indiana population projections indicate the opposite in that the overall county populations will increase by approximately 1,800 people over the 20-Year planning period principally in the county. Center Township's projected populations are estimated by seeing that Center Township historically contains 28% of the county population. Table 3.02-4 shows projected population for Jennings County and Center Township over the next 25 years.

Year	Jennings County Population	Center Township Population*
2010	28,525	8,894
2015	28,954	9,555
2020	29,415	9,707
2025	29,832	9,845
2030	30,099	9,933
2035	30,235	9,978
2040	30,308	10,002

Table 3.01-2 Projected Population

*estimated (data not available from STATS)

3.03 EXISTING TREATMENT & COLLECTION AVAILABLILITY

The city of North Vernon uses a conventional treatment plant. This plant is designed for an average flow of 2.2 MGD with a peak design flow of 4.76 MGD. The existing collection system is a combined sewer system that includes a Storm King for treatment during excess flows. The city utilizes gravity sewer and lift stations throughout the city to transport waste and runoff to the treatment facility.

A long-term Control Plan project is scheduled to be completed in early 2017 for the treatment of combined sewer flows. Storm water flows (in addition to wastewater flow) up to 4.76 MGD can be treated when the improvements are completed.

Since the City has existing wastewater collection and treatment facilities historical data can be used for future projections. Table 3.04-1 indicates the anticipated wastewater flow for the year 2036. The flow increases are intended to be conservative. The population projections are indicating that an increase of 4.5% is anticipated. To be safe, 10% increase of flows are shown.

There are 133 initial users in the study area which are projected to generate approximately 20,000 GPD (0.020 MGD) wastewater flow. Due to the recent construction of SR 750 (US 50 bypass) recent growth in the area, and recent historical growth of the city to north, a higher

growth rate is anticipated to be safe a growth design of 50% is used. This indicates the projected study area design year flows to be 30,000 GPD. Adding this to the existing service area growth indicates a design year flow of 1,130,000 GPD. The existing treatment system has adequate capacity for the study area and the existing system design. Also, the northwest lift station has adequate capacity for the additional 30,000 GPD design year flow

3.04 PROPOSED 20 YEAR DESIGN FLOWS

	Residential	Commercial	Industrial	Total	
Year	Average Day (GPD)	Average Day (GPD)	Average Day (GPD)	Average Day (GPD)	Peak Day (GPD)
2016	650,249	229,751	120,000	1,000,000	1,500,000
2036	715,274	252,726	132,000	1,100,000	1,600,000

Table 3.04-1 Projected 20-Year Flows (Existing Service Area)

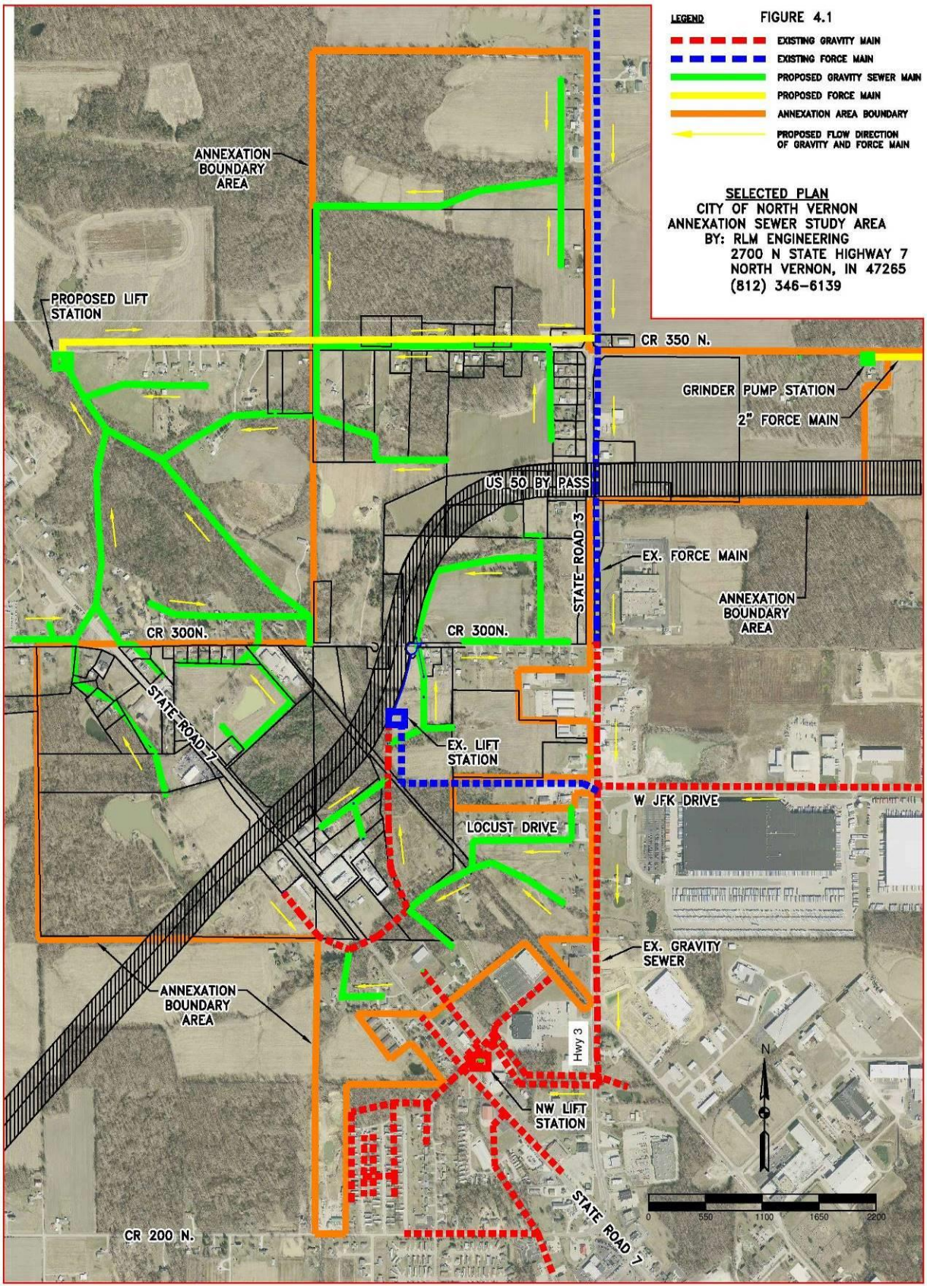
4.01 EVALUATION OF ALTERNATIVES

Generally, the alternatives for the project are limited. The city desires gravity sewer construction to match the existing system configuration. The lower long term operation and maintenance cost associated with gravity sewers versus other types of sewers are also desired. Alternatives for the project are available where relatively long gravity sewers without existing residences could be replaced with a lift station.

The proposed gravity sewer layout planning for the PER utilizes design considerations to minimize the cost of the gravity sewer installation. That is, the shortest route with the shortest depth of sewer to serve the area is determined. The cost of gravity sewer increases as the depth of sewer increases. Generally the sewer layout will follow existing drainage ditches and streams to minimize depth. The layout is also dependent upon the location of development and other obstruction such as roads and other utilities. At times, this may mean that the routing of the sewer at a deeper depth is more advantageous than a layout around or across an obstacle. The SR 750 (US 50 bypass) is one such obstacle in that the cost to cross the bypass with a gravity sewer is significant and the installation of a lift station on each side of the bypass in the annexation area reduces cost.

The layout included in the annexation study provided a starting point for more detailed review. The annexation sewer layout was revised after a more in depth review was made of the contours, building locations, easements, and other utilities. In doing this review and analysis, the lowest cost project is obtained. Topography and layout options were reviewed for the fine tuning of the alignment and alternative analysis.

Figure 4.1 indicates the overall sewer layout from the planning process.


LEGEND
FIGURE 4.1
EXISTING GRAVITY MAIN
EXISTING FORCE MAIN
PROPOSED GRAVITY SEWER MAIN
PROPOSED FORCE MAIN
ANNEXATION AREA BOUNDARY
PROPOSED FLOW DIRECTION OF GRAVITY AND FORCE MAIN
SELECTED PLAN
CITY OF NORTH VERNON
ANNEXATION SEWER STUDY AREA
BY: RLM ENGINEERING
2700 N STATE HIGHWAY 7
NORTH VERNON, IN 47265
(812) 346-6139
ANNEXATION BOUNDARY AREA
PROPOSED LIFT STATION
CR 350 N.
GRINDER PUMP STATION
2" FORCE MAIN
US 50 BY PASS
STATE ROAD 3
EX. FORCE MAIN
ANNEXATION BOUNDARY AREA
CR 300N.
CR 300N.
STATE ROAD 7
EX. LIFT STATION
W JFK DRIVE
LOCUST DRIVE
EX. GRAVITY SEWER
ANNEXATION BOUNDARY AREA
Hwy 3
NW LIFT STATION
STATE ROAD 7
CR 200 N.
N
0
550
1100
1650
2200
Figure 4.01-1

4.02 ALTERNATIVES

A primary objective of the gravity sewer layout planning is to reduce the number of lift stations which are relatively costly to install as well as to operate. The initial layout resulted in two lift stations. However, there were two specific areas which required relatively long gravity sewer segments without any existing residences. An evaluation was conducted on each alternative to determine whether it would be more or less costly if a lift station was installed in lieu of the long gravity sewer segment. The analysis these options considers both the initial construction cost as well as the long term operating costs.

A third area with possible alternatives was analyzed. This third alternative compared the construction of gravity sewers outside of the annexed area to eliminate two lift stations. Due to the topography, the gravity sewers layout appears to work best if an area outside of the annex area is sewered.

The lift station option typically reduces the initial construction cost, but increases the long term operation, maintenance, and replacement cost due to the need of mechanical and electrical equipment. A present worth cost analysis was conducted for an estimate of which option is the least costly, but other factors, such as service area coverage requires consideration.

Consideration of the life expectancy of the options was made. For instance, a life expectancy of the gravity sewer of 80 years is used which is similar for the force main. However, the lift station electrical and mechanical components have a lower life and 20 years is used for the electrical components, but pumps and motors life of 10 years are more typical.

The cost analysis was based upon estimated cost for a 20 year period. The history of power cost is generally annual increases. For this PER, an annual increase of 2% per year for power is used. Growth is also a consideration as it involves increases in pump run time. A growth rate of 2% per year is also considered.

The alternatives are described in the following sections:

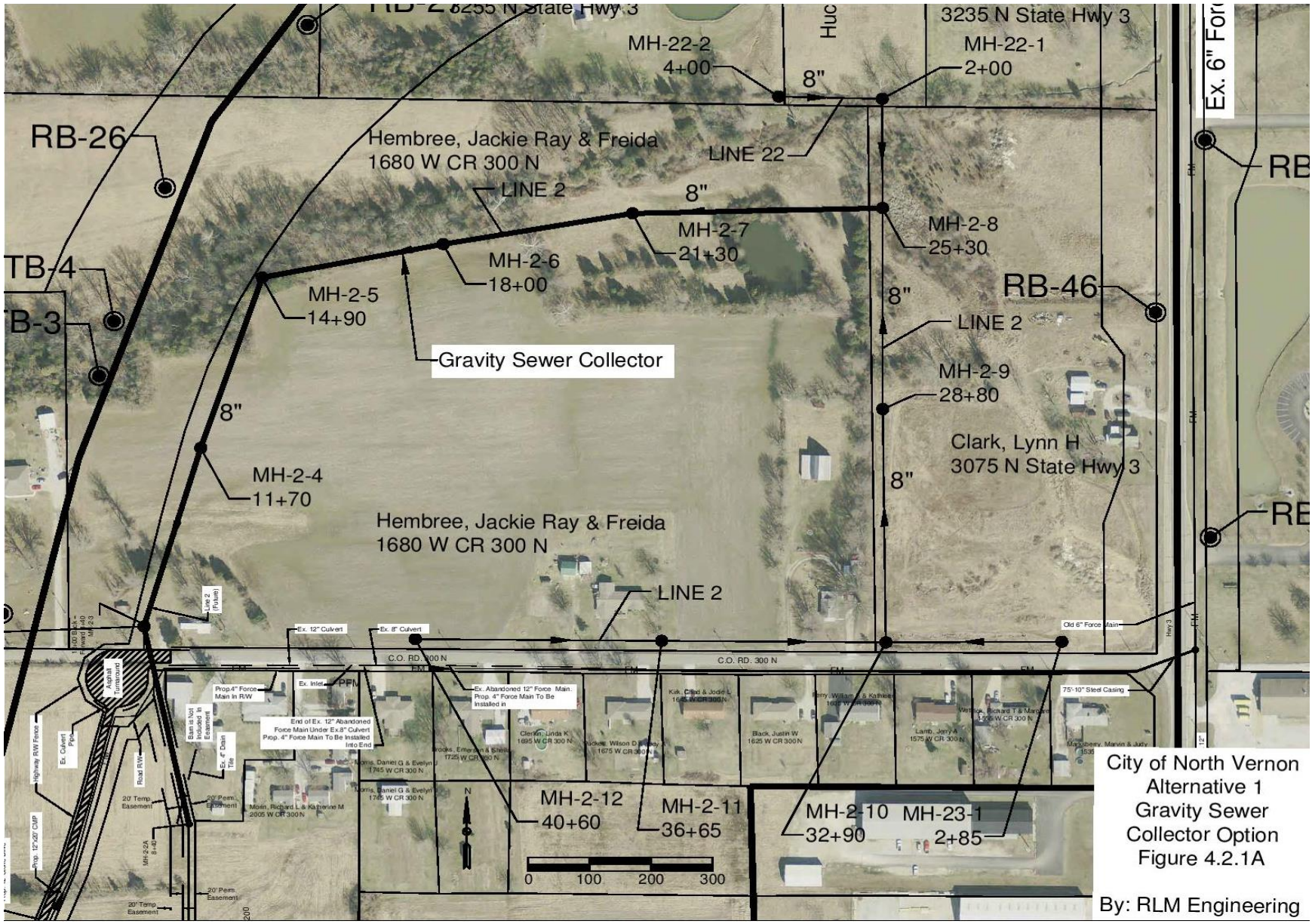
4.02.1 Alternative 1- Long gravity sewer transmission versus lift station and force main for the SR3 and CR 300N area

Due to the density of the development, the long gravity sewer segment for the SR 3 and CR 300N area would not have initial users. In lieu of the long gravity sewer, a lift station and force main could be used. Figures 4.2.1A and 4.2.1.B identify the layout differences for the analysis. There are various advantages and disadvantages for the option. While the gravity sewer sections would not have initial users, it would provide better coverage for future developments and reduce the developments future sewer cost, potentially increasing future developments.

For the lift station option, consideration is needed for the power usage. If the lift station is installed, then the main lift station (the one the gravity sewer flows to), would not be pumping the flow. As two lift stations are less efficient on power cost than one lift station, the analysis considers that the incremental power cost of the option is about 25% of the optimal lift station cost. Growth is also a consideration as it involves increases in pump run time. A growth rate of 2% per year is also considered.

Following tables, 4.02.1A-4.02.1D, provide cost analysis* information.

* Note: Only the cost differences between the alternatives are included


3235 N State Hwy 3
MH-22-2
4+00
MH-22-1
2+00
8"
Ex. 6" For
RB-26
Hembree, Jackie Ray & Freida
1680 W CR 300 N
LINE 22
LINE 2
8"
MH-2-7
21+30
MH-2-8
25+30
RB
TB-4
B-3
MH-2-6
18+00
MH-2-5
14+90
RB-46
8"
LINE 2
Gravity Sewer Collector
MH-2-9
28+80
Clark, Lynn H
3075 N State Hwy 3
8"
8"
MH-2-4
11+70
Hembree, Jackie Ray & Freida
1680 W CR 300 N
LINE 2
RB
Ex. 12" Culvert
Ex. 8" Culvert
Old 6" Force Main
C.O. RD. 300 N
C.O. RD. 300 N
Prop.4" Force Main In R/W
Ex. Inlet
PFN
Ex. Abandoned 12" Force Main. Prop. 4" Force Main To Be Installed in
End of Ex. 12" Abandoned Force Main Under Ex.8" Culvert Prop. 4" Force Main To Be Installed Into End
75'-10" Steel Casing
Asphalt Turnaround
Highway R/W Fence
Ex. Culvert Pipe
Road R/W
Barn is Not Included In Easement
Ex. 4" Drain Tile
20' Temp. Easement
20' Perm. Easement
Prop. 12"-20' CMP
MH-2-12
40+60
MH-2-11
36+65
MH-2-10
32+90
MH-23-1
2+85
0
100
200
300
N
City of North Vernon
Alternative 1
Gravity Sewer
Collector Option
Figure 4.2.1A
By: RLM Engineering

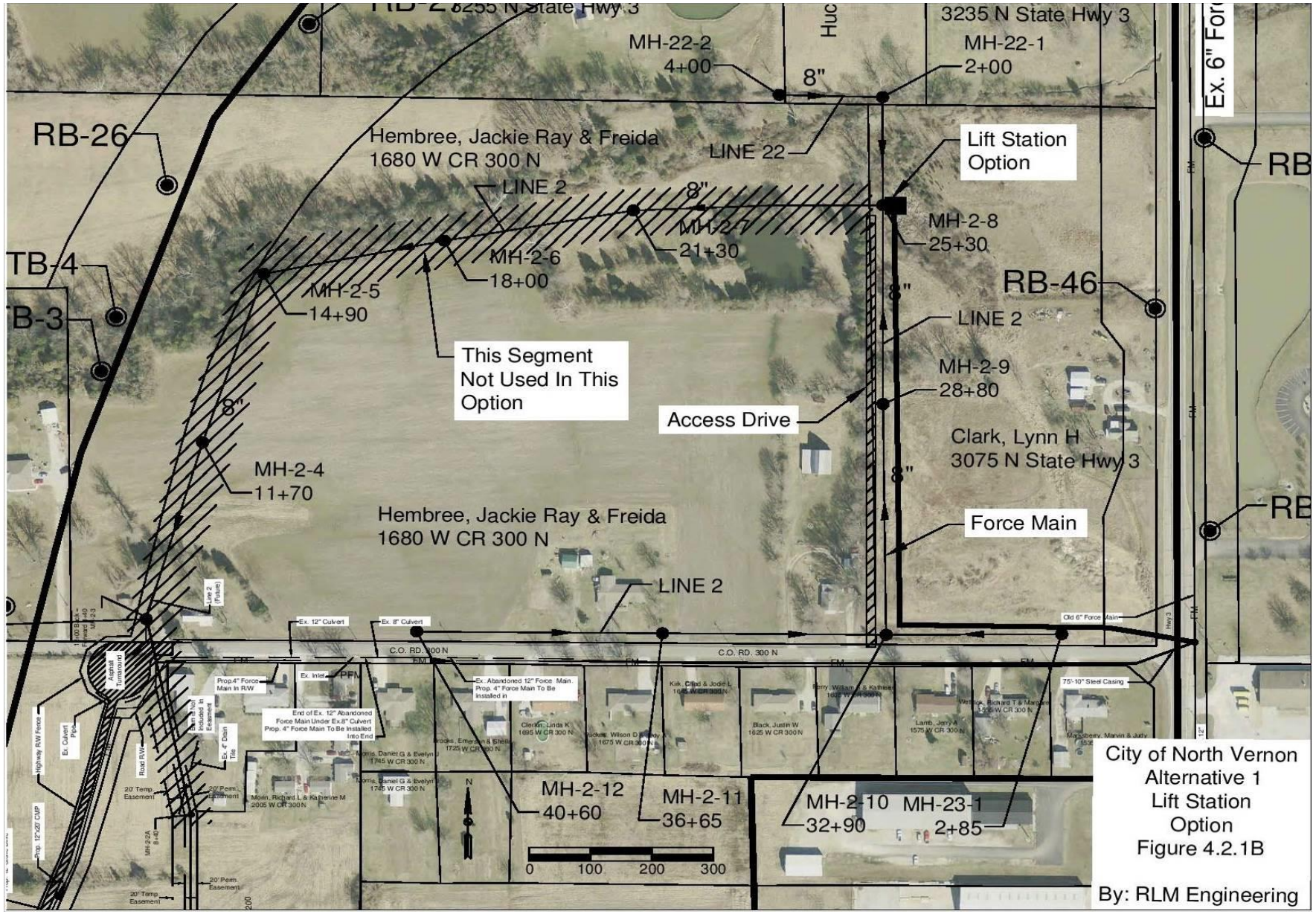

3235 N State Hwy 3
MH-22-2
4+00
8"
MH-22-1
2+00
Ex. 6" For
RB-26
Hembree, Jackie Ray & Freida
1680 W CR 300 N
LINE 22
Lift Station
Option
RB
LINE 2
8"
MH-2-1
21+30
MH-2-8
25+30
TB-4
MH-2-6
18+00
MH-2-5
14+90
RB-46
8"
LINE 2
This Segment
Not Used In This
Option
MH-2-9
28+80
Access Drive
Clark, Lynn H
3075 N State Hwy 3
8"
MH-2-4
11+70
Hembree, Jackie Ray & Freida
1680 W CR 300 N
Force Main
RB
LINE 2
Ex. 12" Culvert
Ex. 8" Culvert
Old 6" Force Main
C.O. RD. 300 N
C.O. RD. 300 N
Prop.4" Force
Main In R/W
Ex. Inlet
PPM
Ex. Abandoned 12" Force Main
Prop. 4" Force Main To Be
Installed in
75'-10" Steel Casing
End of Ex. 12" Abandoned
Force Main Under Ex.8" Culvert
Prop. 4" Force Main To Be Installed
Into End
Clerkin, Linda K
1695 W CR 300 N
Back, Justin W
1625 W CR 300 N
Lamb, Jerry A
1575 W CR 300 N
Brooks, Emerson & Sheila
1725 W CR 300 N
Morris, Daniel G & Evelyn
1745 W CR 300 N
Highway R/W Fence
Ex. Culvert
Pipe
Road R/W
Ex. 4" Drain
Tile
20' Temp
Easement
20' Perm.
Easement
Mosier, Richard L & Katherine M
2005 W CR 300 N
MH-2-12
40+60
MH-2-11
36+65
MH-2-10
32+90
MH-23-1
2+85
N
0
100
200
300
Prop. 12'-20' CMP
20' Perm.
Easement
20' Temp
Easement
City of North Vernon
Alternative 1
Lift Station
Option
Figure 4.2.1B
By: RLM Engineering

Table 4.2.1 A Alternative 1 Gravity Sewer Segment Option				
Item		Quantity	Unit Cost	Item Total
0-6 Feet Depth Gravity Sewer		230	$39.00	$8,970.00
6-8 Feet Depth Gravity Sewer		220	$43.00	$9,460.00
8-10 Feet Depth Gravity Sewer		350	$49.00	$17,150.00
10-12 Feet Depth Gravity Sewer		50	$55.00	$2,750.00
12-14 Feet Depth Gravity Sewer		150	$60.00	$9,000.00
14-16 Feet Depth Gravity Sewer		130	$65.00	$8,450.00
16-18 Feet Depth Gravity Sewer		140	$70.00	$9,800.00
18-20 Feet Depth Gravity Sewer		140	$80.00	$11,200.00
20-22 Feet Depth Gravity Sewer		280	$95.00	$26,600.00
22-24 Feet Depth Gravity Sewer		30	$110.00	$3,300.00
24-26 Feet Depth Gravity Sewer		120	$125.00	$15,000.00
26-28 Feet Depth Gravity Sewer		180	$140.00	$25,200.00
0-6 Feet Depth manhole		1	$3,400.00	$3,400.00
8-10 Feet Depth manhole		2	$4,200.00	$8,400.00
12-14 Feet Depth manhole		1	$5,800.00	$5,800.00
20-22 Feet Depth manhole		2	$10,200.00	$20,400.00
pavement repair		50	$35.00	$1,750.00
estimated construction				$186,630.00
estimated construction contingency				$18,370.00
total estimated cost				$205,000.00
engineering				
inspection				
survey				
land				
permits				
legal				
other				
total non construction cost				$62,000.00
Total estimated project cost				**$267,000.00**

Table 4.2.1 B Alternative 1 Lift Station Option				
Item		Quantity	Unit Cost	Item Total
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		1300	$17.00	$22,100.00
12' wide access drive		800	$12.00	$9,600.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$5,000.00	$5,000.00
Highway bore with 10" casing and 4"pvc force main		70	100	$7,000.00
pavement Repair				
driveway repair				
estimated construction				$198,700.00
estimated construction contingency				$19,300.00
total estimated cost				$218,000.00
engineering				
inspection				
survey				
land				
permits				
legal				
other				
total non construction cost				$65,000.00
Total estimated project cost				**$283,000.00**

Interest Rate	3.50%							
Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$0	$0	$0	$0	$0	$0	$0	$0
2	$0	$0	$0	$0	$0	$0	$0	$0
3	$0	$0	$0	$0	$0	$0	$0	$0
4	$0	$0	$0	$0	$0	$0	$0	$0
5	$0	$500	$0	$0	$0	$0	$500	$421
6	$0	$0	$0	$0	$0	$0	$0	$0
7	$0	$0	$0	$0	$0	$0	$0	$0
8	$0	$0	$0	$0	$0	$0	$0	$0
9	$0	$0	$0	$0	$0	$0	$0	$0
10	$0	$500	$0	$0	$0	$0	$500	$354
11	$0	$0	$0	$0	$0	$0	$0	$0
12	$0	$0	$0	$0	$0	$0	$0	$0
13	$0	$0	$0	$0	$0	$0	$0	$0
14	$0	$0	$0	$0	$0	$0	$0	$0
15	$0	$500	$0	$0	$0	$0	$500	$298
16	$0	$0	$0	$0	$0	$0	$0	$0
17	$0	$0	$0	$0	$0	$0	$0	$0
18	$0	$0	$0	$0	$0	$0	$0	$0
19	$0	$0	$0	$0	$0	$0	$0	$0
20	$0	$500	$0	$0	$0	$0	$500	$251
Total Annual Costs								$1,325
Salvage Value after 20 years			$214,000					
Present worth of salvage value			($107,549)					

Table 4.2.1 D Present Worth of Annual Costs for Alternative 1 Lift Station Option								
Interest Rate	3.5%							
Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$50	$0	$0	$0	$0	$0	$50	$48
2	$52	$500	$0	$0	$0	$0	$552	$515
3	$54	$0	$0	$0	$0	$0	$54	$49
4	$56	$500	$0	$0	$0	$0	$556	$485
5	$59	$0	$0	$0	$0	$0	$59	$49
6	$61	$500	$0	$0	$0	$0	$561	$456
7	$63	$0	$0	$0	$0	$0	$63	$50
8	$66	$500	$0	$0	$0	$0	$566	$430
9	$69	$0	$0	$0	$0	$0	$69	$50
10	$71	$500	$3,000	$2,500	$0	$0	$6,071	$4,304
11	$74	$0	$0	$0	$0	$0	$74	$51
12	$77	$500	$0	$0	$0	$0	$577	$382
13	$80	$0	$0	$0	$0	$0	$80	$51
14	$84	$500	$0	$0	$0	$0	$584	$361
15	$87	$0	$0	$0	$0	$0	$87	$52
16	$91	$500	$0	$0	$0	$0	$591	$341
17	$94	$0	$0	$0	$0	$0	$94	$53
18	$98	$500	$0	$0	$0	$0	$598	$322
19	$102	$0	$0	$0	$0	$0	$102	$53
20	$106	$500	$0	$0	$0	$0	$606	$305
Total								$8,407
Salvage Value after 20 years			$85,000					
Present worth of salvage value			($42,718)					

The Present Worth analysis for the 20 year period is the initial project cost plus the present worth of the annual costs less the salvage value. The Present Worth represents the funds that you would need today to construct and operate the alternative for 20 years when considering the appropriate interest rate less the salvage value after the 20 year period.

For Alternative 1, the present worth costs are summarized as follow:

Item	Alt 1 Gravity Sewer	Alt 1 Lift Station
Project Costs	$267,000	$283,000
PW of Annual Costs	$1,325	$8,407
Salvage Value	$-107,549	$-42,718
Total Present Worth Costs	$160,776	$248,689

4.02.2 Alternative 2- Gravity sewer transmission versus lift station and force main for the SR 3 and CR 350N area

This alternative was developed prior to the construction of the lift station along SR3 (north of CR 350N). The Lift station was constructed for the development to be completed in 2017. The alternative analysis was useful in coordinating the wastewater service for the development. The analysis is included as a reference.

The analysis was presented to the utility board for addition opinions and discussions. The utility board agreed with pursuing the lift station option. Shortly afterwards, the city announced a proposed development to take place in this area. The development was for a manufacturing facility with proposed completion in early to mid-2017.

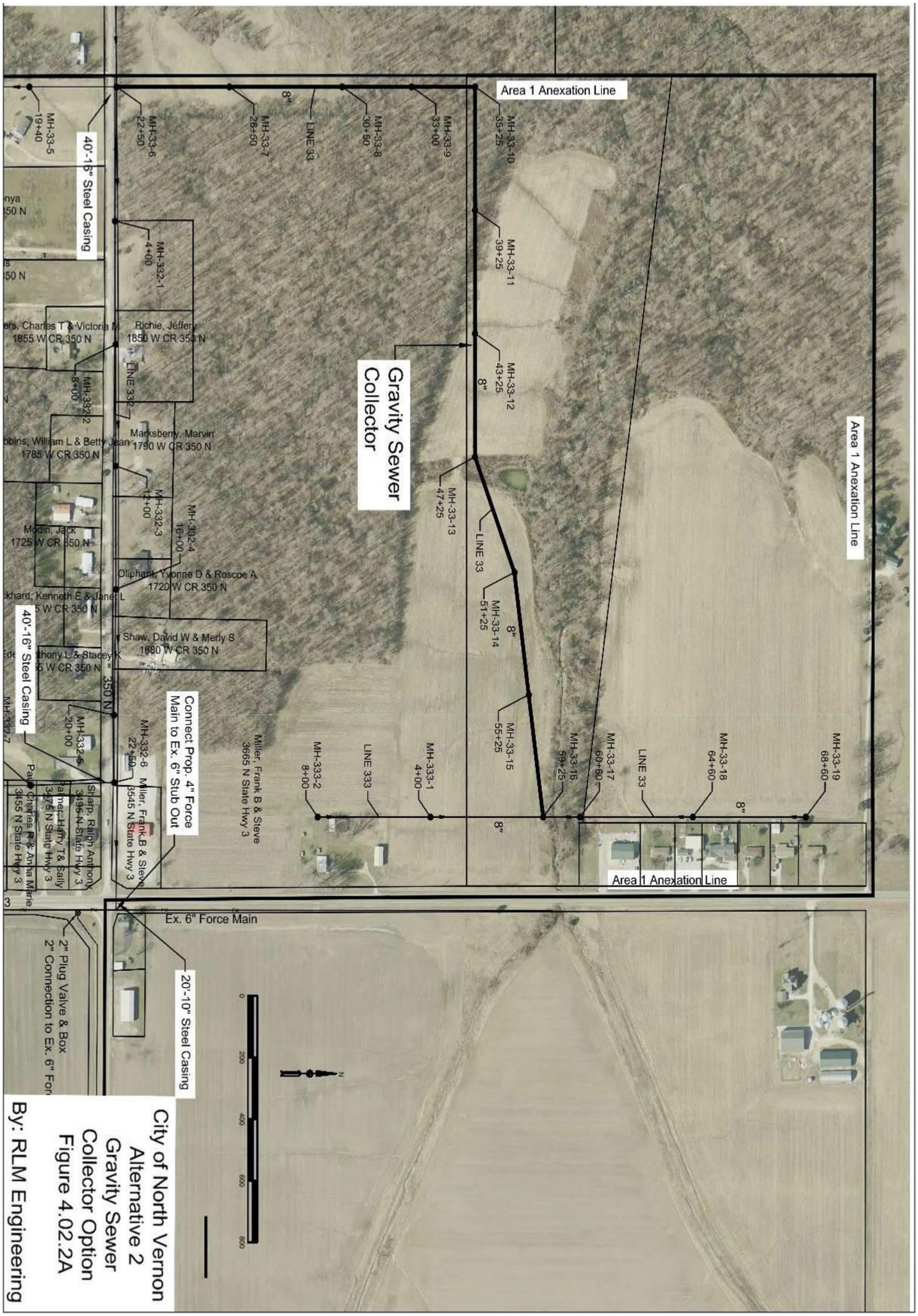
Due to the timing of this study, the City is constructing the lift station and force main as proposed in this alternative for completion in early 2017. The lift station and force main is being funded by the North Vernon Redevelopment Commission. Therefore, the lift station is considered as existing for the proposed recommended project.

As with Alternative 1 due to the development density, the proposed long gravity sewer for the SR 3 and CR 350N area would not have initial users. In lieu of the long gravity sewer, a lift station and force main could be used. Figures 4.02.2 A and 4.02.2 B identifies the layout differences for the analysis. A difference between this alternative and alternative 1, is that the topography of alternative 1 does not allow the lift station option to provide much coverage of the area. For the Alternative 2 lift station option, approximately 65% of the gravity sewer option can be covered with the lift station option.

This lift station power option is similar to Alternative 1. If the lift station is installed, then the main lift station (the one the gravity sewer flows to), would not be pumping the flow. As two lift stations are less efficient on power cost than one lift station, the analysis considers that the incremental power cost of the option is about 25% of the optimal lift station cost. Growth is also a consideration as it involves increases in pump run time. A growth rate of 2% per year is also considered.

Following are tables, 4.02.2A-4.02.2D, provide cost analysis* information.

* Note: Only the cost differences between the alternatives are included.


City of North Vernon
Alternative 2
Gravity Sewer
Collector Option
Figure 4.02.2A
By: RLM Engineering
Gravity Sewer
Collector
Area 1 Anexation Line
Area 1 Anexation Line
Area 1 Anexation Line
LINE 33
LINE 33
LINE 33
LINE 332
LINE 333
MH-33-5
19+40
MH-33-6
22+50
MH-33-7
26+50
MH-33-8
30+50
MH-33-9
33+00
MH-33-10
35+25
MH-33-11
39+25
MH-33-12
43+25
MH-33-13
47+25
MH-33-14
51+25
MH-33-15
55+25
MH-33-16
59+25
MH-33-17
60+60
MH-33-18
64+60
MH-33-19
68+60
MH-332-1
4+00
MH-332-2
8+00
MH-332-3
12+00
MH-332-4
16+00
MH-332-5
20+00
MH-332-6
22+50
MH-333-1
4+00
MH-333-2
8+00
8"
40'-16" Steel Casing
40'-16" Steel Casing
20'-10" Steel Casing
Connect Prop. 4" Force
Main to Ex. 6" Stub Out
Ex. 6" Force Main
2" Plug Valve & Box
Richie, Jeffery
1850 W CR 350 N
Marksberry, Marvin
1790 W CR 350 N
1785 W CR 350 N
Modin, Jack
1725 W CR 350 N
Oliphant, Yvonne D & Roscoe A
1720 W CR 350 N
Shaw, David W & Merly S
1680 W CR 350 N
1855 W CR 350 N
Miller, Frank B & Steve
3665 N State Hwy 3
Miller, Frank B & Steve
3545 N State Hwy 3
350 N
0
200
400
600
800
N

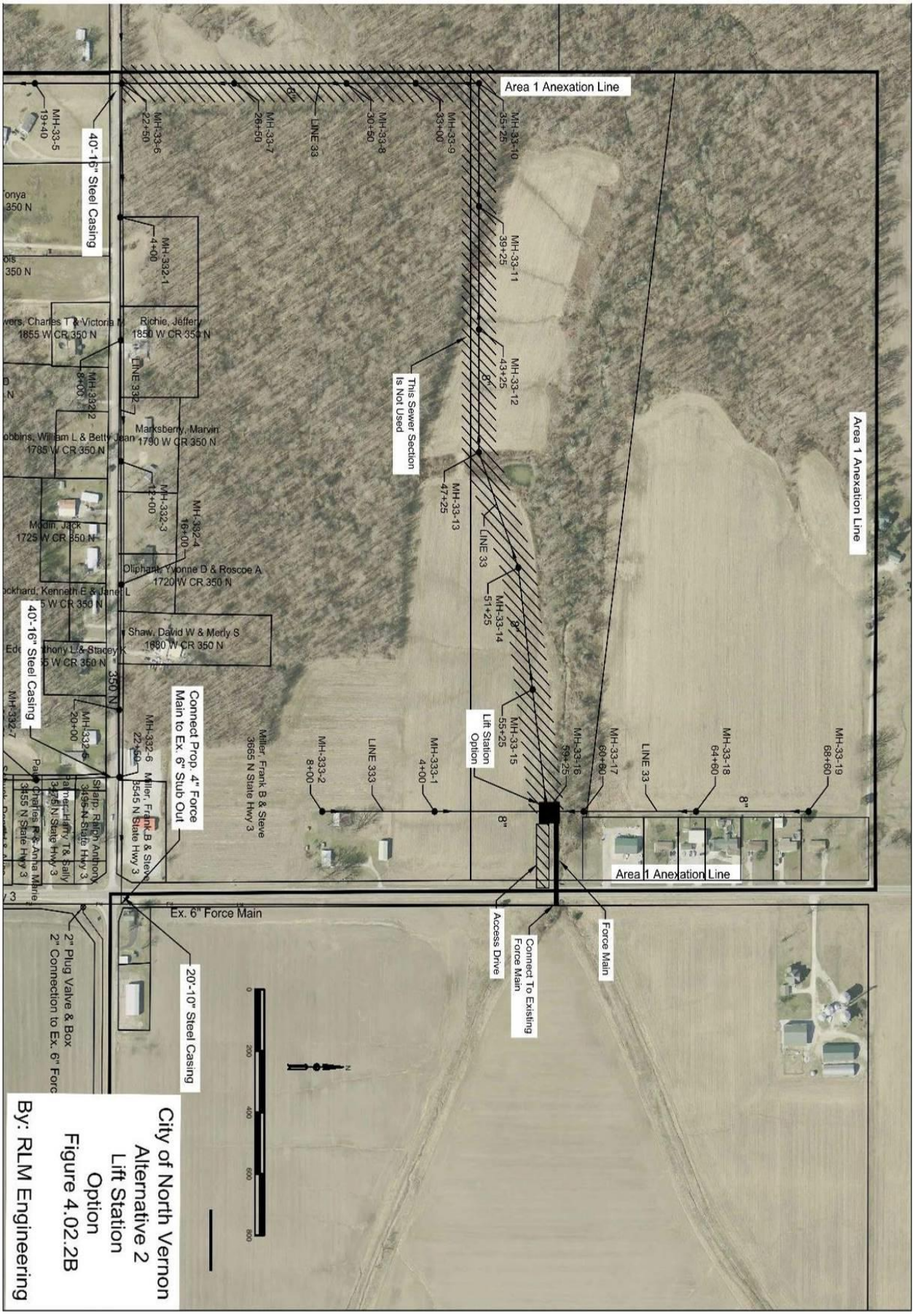

Area 1 Anexation Line
MH-33-10
35+25
MH-33-11
39+25
MH-33-12
43+25
MH-33-13
47+25
MH-33-14
51+25
MH-33-15
55+25
MH-33-16
59+25
MH-33-17
60+60
MH-33-18
64+60
MH-33-19
68+60
MH-33-9
33+00
MH-33-8
30+50
MH-33-7
26+50
MH-33-6
22+50
MH-33-5
19+40
LINE 33
8"
40'-16" Steel Casing
This Sewer Section Is Not Used
Lift Station Option
Force Main
Connect To Existing Force Main
Access Drive
Area 1 Anexation Line
MH-332-1
4+00
MH-332-2
8+00
MH-332-3
12+00
MH-332-4
16+00
MH-332-5
20+00
MH-332-6
22+50
MH-332-7
LINE 332
LINE 333
MH-333-1
4+00
MH-333-2
8+00
Richie, Jeffery
1850 W CR 350 N
Marksberry, Marvin
1790 W CR 350 N
Shaw, David W & Merly S
1680 W CR 350 N
Miller, Frank B & Steve
3665 N State Hwy 3
Miller, Frank B & Steve
3545 N State Hwy 3
Connect Prop. 4" Force Main to Ex. 6" Stub Out
Ex. 6" Force Main
20'-10" Steel Casing
2" Plug Valve & Box
2" Connection to Ex. 6" Force
City of North Vernon
Alternative 2
Lift Station
Option
Figure 4.02.2B
By: RLM Engineering

Table 4.2.2 A Alternative 2 Gravity Sewer Option				
Item		Quantity	Unit Cost	Item Total
0-6 Feet Depth Gravity Sewer		300	$39.00	$11,700.00
6-8 Feet Depth Gravity Sewer		360	$43.00	$15,480.00
8-10 Feet Depth Gravity Sewer		120	$49.00	$5,880.00
10-12 Feet Depth Gravity Sewer		160	$55.00	$8,800.00
12-14 Feet Depth Gravity Sewer		210	$60.00	$12,600.00
14-16 Feet Depth Gravity Sewer		250	$65.00	$16,250.00
16-18 Feet Depth Gravity Sewer		350	$70.00	$24,500.00
18-20 Feet Depth Gravity Sewer		425	$80.00	$34,000.00
20-22 Feet Depth Gravity Sewer		550	$95.00	$52,250.00
22-24 Feet Depth Gravity Sewer		580	$110.00	$63,800.00
24-26 Feet Depth Gravity Sewer		370	$125.00	$46,250.00
0-6 Feet Depth manhole		2	$3,400.00	$6,800.00
8-10 Feet Depth manhole		1	$4,200.00	$4,200.00
16-18 Feet Depth manhole		2	$7,800.00	$15,600.00
18-20 Feet Depth manhole		1	$9,000.00	$9,000.00
20-22 Feet Depth manhole		1	$10,200.00	$10,200.00
22-24 Feet Depth manhole		2	$11,500.00	$23,000.00
24-26 Feet Depth manhole		1	$13,000.00	$13,000.00
estimated construction				$373,310.00
estimated construction contingency				$37,500.00
total estimated cost				$410,810.00
engineering				
inspection				
survey				
land				
permits				
legal				
other				
total non construction cost				$120,000.00
Total estimated project cost				**$530,810.00**

Table 4.2.2 B Alternative 2 Lift Station Option				
Item		Quantity	Unit Cost	Item Total
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		250	$17.00	$4,250.00
12' wide access drive		250	$12.00	$3,000.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$5,000.00	$5,000.00
Highway bore with 10" casing and 4"pvc force main		70	100	$7,000.00
pavement Repair				
driveway repair				
estimated construction				$174,250.00
estimated construction contingency				$15,750.00
total estimated cost				$190,000.00
engineering				
inspection				
survey				
land				
permits				
legal				
other				
total non construction cost				$57,000.00
Total estimated project cost				**$247,000.00**

Table 4.2.2 C Present Worth of Annual Costs for Alternative 2 Gravity Sewer Option

Interest Rate	3.50%

Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$0	$0	$0	$0	$0	$0	$0	$0
2	$0	$0	$0	$0	$0	$0	$0	$0
3	$0	$0	$0	$0	$0	$0	$0	$0
4	$0	$0	$0	$0	$0	$0	$0	$0
5	$0	$500	$0	$0	$0	$0	$500	$421
6	$0	$0	$0	$0	$0	$0	$0	$0
7	$0	$0	$0	$0	$0	$0	$0	$0
8	$0	$0	$0	$0	$0	$0	$0	$0
9	$0	$0	$0	$0	$0	$0	$0	$0
10	$0	$500	$0	$0	$0	$0	$500	$354
11	$0	$0	$0	$0	$0	$0	$0	$0
12	$0	$0	$0	$0	$0	$0	$0	$0
13	$0	$0	$0	$0	$0	$0	$0	$0
14	$0	$0	$0	$0	$0	$0	$0	$0
15	$0	$500	$0	$0	$0	$0	$500	$298
16	$0	$0	$0	$0	$0	$0	$0	$0
17	$0	$0	$0	$0	$0	$0	$0	$0
18	$0	$0	$0	$0	$0	$0	$0	$0
19	$0	$0	$0	$0	$0	$0	$0	$0
20	$0	$500	$0	$0	$0	$0	$500	$251
Total Annual Costs								$1,325
Salvage Value after 20 years			$405,000					
Present worth of salvage value			($203,539)					

Table 4.2.1 D Present Worth of Annual Costs for Alternative 1 Lift Station Option								
Interest Rate	3.5%							
Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$42	$0	$0	$0	$0	$0	$42	$41
2	$44	$500	$0	$0	$0	$0	$544	$508
3	$45	$0	$0	$0	$0	$0	$45	$41
4	$47	$500	$0	$0	$0	$0	$547	$477
5	$49	$0	$0	$0	$0	$0	$49	$41
6	$51	$500	$0	$0	$0	$0	$551	$448
7	$53	$0	$0	$0	$0	$0	$53	$42
8	$55	$500	$0	$0	$0	$0	$555	$422
9	$58	$0	$0	$0	$0	$0	$58	$42
10	$60	$500	$3,000	$2,500	$0	$0	$6,060	$4,296
11	$62	$0	$0	$0	$0	$0	$62	$43
12	$65	$500	$0	$0	$0	$0	$565	$374
13	$68	$0	$0	$0	$0	$0	$68	$43
14	$70	$500	$0	$0	$0	$0	$570	$352
15	$73	$0	$0	$0	$0	$0	$73	$44
16	$76	$500	$0	$0	$0	$0	$576	$332
17	$79	$0	$0	$0	$0	$0	$79	$44
18	$82	$500	$0	$0	$0	$0	$582	$314
19	$86	$0	$0	$0	$0	$0	$86	$45
20	$89	$500	$0	$0	$0	$0	$589	$296
Total								$8,244
Salvage Value after 20 years			$80,000					
Present worth of salvage value			($40,205)					

For Alternative 2, the present worth costs are summarized as follow:

Item	Alt 2 Gravity Sewer	Alt 2 Lift Station
Project Costs	$530,810	$247,000
PW of Annual Costs	$1,325	$8,244
Salvage Value	$-203,509	$-40,205
Total Present Worth Costs	$328,626	$215,039

4.02.3 Alternative 3- Gravity Sewer transmission and single lift station versus multiple lifts stations and force main for the 300N to 350N East of Hwy. 7

Figures 4.02.3 A and 4.02.3 B identifies the layout differences for the analysis.

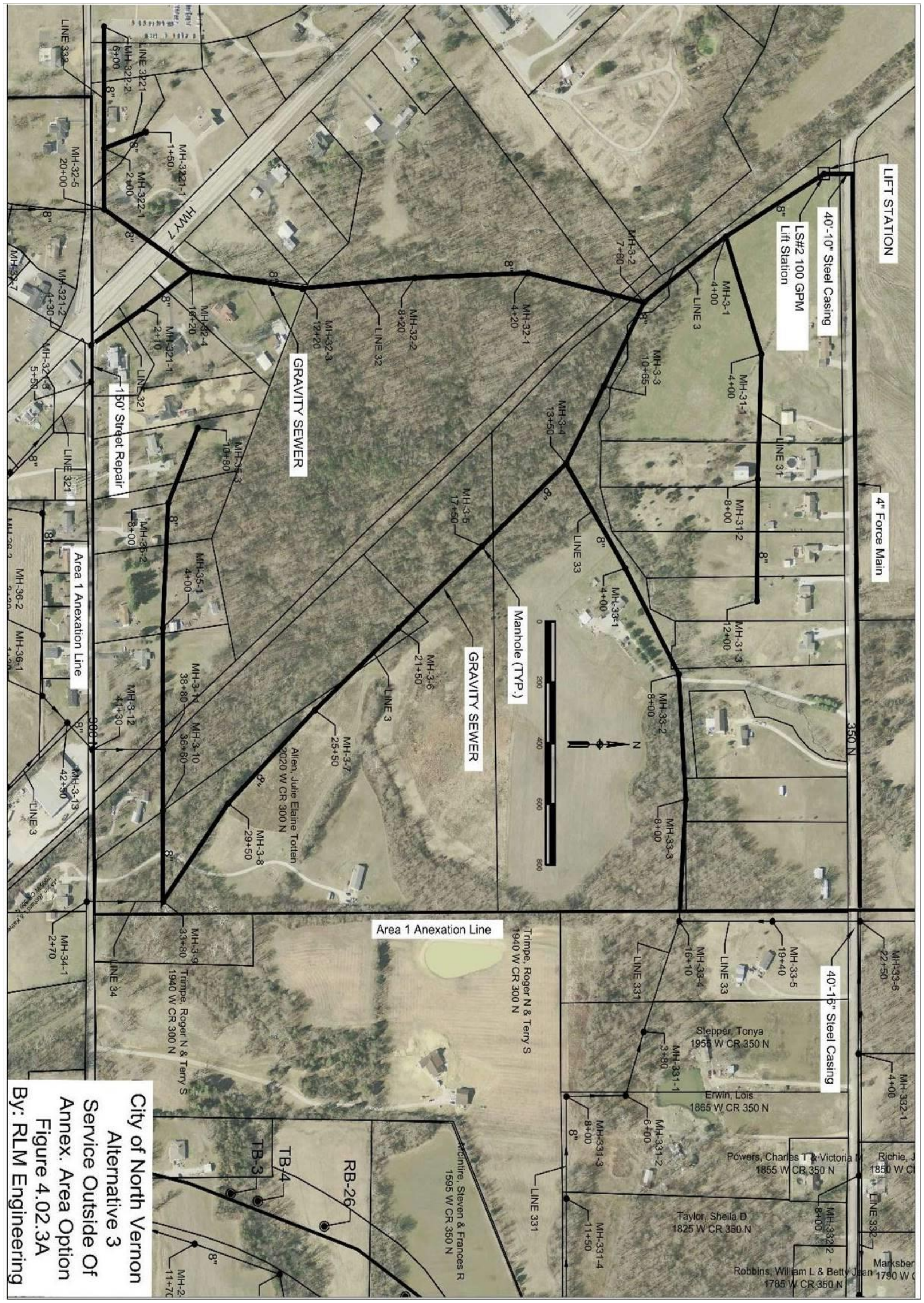
Due to the local landscape, a long gravity sewer with single pump station would have to lie outside of city limits. In lieu of a gravity sewer outside city limits, three lift stations and force main could be used. There are various pros and cons for the option. While the gravity sewer sections would have a higher initial cost, it would allow of the immediate addition of 29 users. The gravity sewer would also provide more coverage for potential future customers.

Opting for the three lift station option reduces the initial construction cost, but increases the long term operation, maintenance, and replacement cost due to the need of mechanical and electrical equipment at three lift stations rather than one. A present worth cost analysis was conducted for an estimate of which option is the least costly, but other factors, such as service area coverage requires consideration.

For this multiple lift station option, the lift stations are in series. That is, one lift station pumps to another lift station. So a portion of the flow is pumped 3 times which increases the power costs versus alternatives 1and 2.

Following are tables, 4.02.3A-4.02.3D, provide cost analysis* information.

* Note: Only the cost differences between the alternatives are included.


City of North Vernon
Alternative 3
Service Outside Of
Annex. Area Option
Figure 4.02.3A
By: RLM Engineering
LIFT STATION
40'-10" Steel Casing
LS#2 100 GPM
Lift Station
4" Force Main
GRAVITY SEWER
GRAVITY SEWER
Manhole (TYP.)
150' Street Repair
Area 1 Anexation Line
Area 1 Anexation Line
40'-16" Steel Casing
HWY 7
350 N
LINE 3
LINE 31
LINE 32
LINE 33
LINE 321
LINE 331
LINE 34
Allen, Julie Elaine Totten
2020 W CR 300 N
Trimpe, Roger N & Terry S
1940 W CR 300 N
Stepper, Tonya
1955 W CR 350 N
Erwin, Lois
1865 W CR 350 N
Powers, Charles T & Victoria M
1855 W CR 350 N
Taylor, Sheila D
1825 W CR 350 N
Robbins, William L & Betty Jean
1785 W CR 350 N
McIntire, Steven & Frances R
1595 W CR 350 N
RB-26
TB-3
TB-4

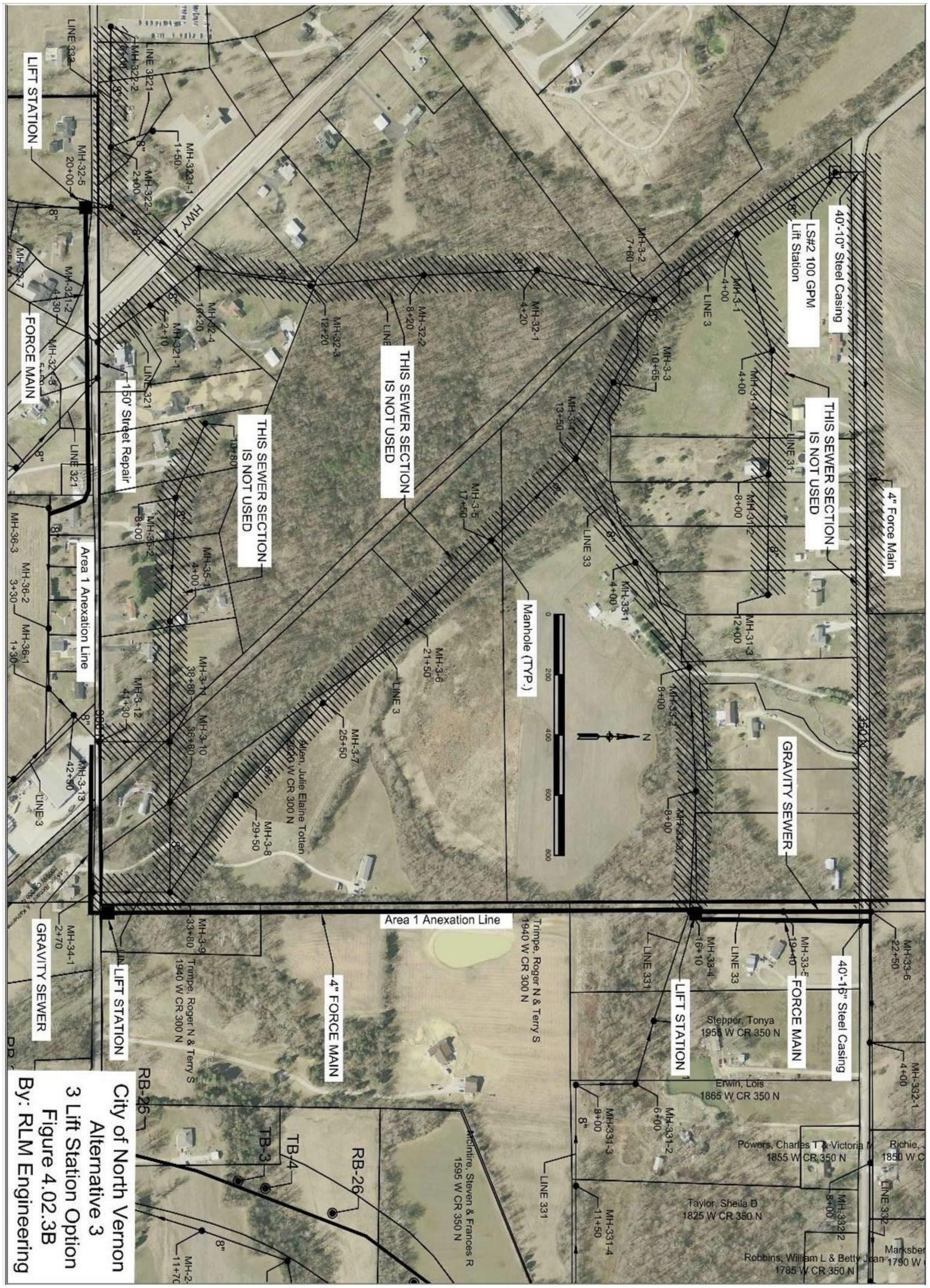

City of North Vernon
Alternative 3
3 Lift Station Option
Figure 4.02.3B
By: RLM Engineering
THIS SEWER SECTION IS NOT USED
LIFT STATION
FORCE MAIN
GRAVITY SEWER
4" FORCE MAIN
Area 1 Anexation Line
LS#2 100 GPM Lift Station
40'-10" Steel Casing
40'-16" Steel Casing
4" Force Main
Manhole (TYP.)
150' Street Repair
HWY 7

Table 4.2.3 A Alternative 3 Gravity Sewer Option				
Item		Quantity	Unit Cost	Item Total
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		2500	$17.00	$42,500.00
12' wide access drive		100	$12.00	$1,200.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$5,000.00	$5,000.00
pavement repair		30	$35.00	$1,050.00
0-6 Feet Depth Gravity Sewer		3820	$39.00	$148,980.00
6-8 Feet Depth Gravity Sewer		4330	$43.00	$186,190.00
8-10 Feet Depth Gravity Sewer		1860	$49.00	$91,140.00
10-12 Feet Depth Gravity Sewer		940	$55.00	$51,700.00
12-14 Feet Depth Gravity Sewer		420	$60.00	$25,200.00
14-16 Feet Depth Gravity Sewer		100	$65.00	$6,500.00
0-6 Feet Depth manhole		13	$3,400.00	$44,200.00
6-8 Feet Depth manhole		9	$3,700.00	$33,300.00
8-10 Feet Depth manhole		8	$4,200.00	$33,600.00
10-12 Feet Depth manhole		1	$5,000.00	$5,000.00
12-14 Feet Depth manhole		2	$5,800.00	$11,600.00
pavement repair		50	$35.00	$1,750.00
16" casing hwy bore w/ 8" sewer		210	$150.00	$31,500.00
drive repair		50	$20.00	$1,000.00
service connection		29	$200.00	$5,800.00
6" service line		400	$25.00	$10,000.00
estimated construction				$892,210.00
estimated construction contingency				$89,790.00
total estimated cost				$982,000.00
Non-Construction Costs				$108,000.00
engineering				$45,000.00
inspection				$20,000.00
survey				$50,000.00
land				$5,000.00
permits				$5,000.00
legal				$30,000.00
other				$25,000.00
total non construction cost				$288,000.00
Total estimated project cost				**$1,270,000.00**

Table 4.2.3 B Alternative 3 Multiple Lift Station Option				
Item		Quantity	Unit Cost	Item Total
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		650	$17.00	$11,050.00
12' wide access drive		600	$12.00	$7,200.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$5,000.00	$5,000.00
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		2000	$17.00	$34,000.00
12' wide access drive		100	$12.00	$1,200.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$5,000.00	$5,000.00
Lift Station w/ valve pit		1	$150,000.00	$150,000.00
4" Force Main		1000	$17.00	$17,000.00
12' wide access drive		50	$12.00	$600.00
fencing/site work		1	$5,000.00	$5,000.00
electrical		1	$25,000.00	$25,000.00
Highway bore with 10" casing				
pavement Repair		30	$35.00	$1,050.00
driveway repair		300	$20.00	$6,000.00
12" casing hwy bore w/ 4" force main		240	$100.00	$24,000.00
6-8 feet depth sewer		1200	$43.00	$51,600.00
6-8 feet depth manhole		5	$3,700.00	$18,500.00
pavement repair		30	$35.00	$1,050.00
16" casing hwy bore w/ 8" sewer		200	$150.00	$30,000.00
Estimated construction				$703,250.00
Estimated construction contingency				$70,750.00
Total estimated cost				$774,000.00
Non-Construction Cost				$88,000.00
engineering				$30,000.00
inspection				$10,000.00
survey				$20,000.00
land				$15,000.00
permits				$2,000.00
legal				$20,000.00
other				$25,000.00
Total non construction cost				$210,000.00
Total estimated project cost				**$984,000.00**

Table 4.2.3 C Present Worth of Annual Costs for Alternative 3 Gravity Sewer Option								
Interest Rate	3.50%							
Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$0	$200	$0	$0	$0	$0	$200	$193
2	$0	$200	$0	$0	$0	$0	$200	$187
3	$0	$200	$0	$0	$0	$0	$200	$180
4	$0	$200	$0	$0	$0	$0	$200	$174
5	$0	$1,000	$0	$0	$0	$0	$1,000	$842
6	$0	$200	$0	$0	$0	$0	$200	$163
7	$0	$200	$0	$0	$0	$0	$200	$157
8	$0	$200	$0	$0	$0	$0	$200	$152
9	$0	$200	$0	$0	$0	$0	$200	$147
10	$0	$1,000	$5,000	$4,000	$0	$0	$10,000	$7,089
11	$0	$200	$0	$0	$0	$0	$200	$137
12	$0	$200	$0	$0	$0	$0	$200	$132
13	$0	$200	$0	$0	$0	$0	$200	$128
14	$0	$200	$0	$0	$0	$0	$200	$124
15	$0	$1,000	$0	$0	$0	$0	$1,000	$597
16	$0	$200	$0	$0	$0	$0	$200	$115
17	$0	$200	$0	$0	$0	$0	$200	$111
18	$0	$200	$0	$0	$0	$0	$200	$108
19	$0	$200	$0	$0	$0	$0	$200	$104
20	$0	$1,000	$0	$0	$0	$0	$1,000	$503
Total Annual Costs								$11,343
Salvage Value after 20 years			$1,016,000					
Present worth of salvage value			($510,607)					

Table 4.2.3 D Present Worth of Annual Costs for Alternative 3 Multiple Lift Station Option								
Interest Rate	3.5%							
Year	Power	Maintenance & Repairs	Replacement				Total Annual Cost	Present worth of annual cost
			Pumps	Motors	Electrical	Structural		
1	$240	$600	$0	$0	$0	$0	$840	$812
2	$250	$1,500	$0	$0	$0	$0	$1,750	$1,633
3	$260	$600	$0	$0	$0	$0	$860	$775
4	$270	$1,500	$0	$0	$0	$0	$1,770	$1,543
5	$281	$600	$0	$0	$0	$0	$881	$742
6	$293	$1,500	$0	$0	$0	$0	$1,793	$1,458
7	$304	$600	$0	$0	$0	$0	$904	$711
8	$317	$1,500	$0	$0	$0	$0	$1,817	$1,380
9	$329	$600	$0	$0	$0	$0	$929	$682
10	$343	$1,500	$12,000	$10,000	$0	$0	$23,843	$16,903
11	$357	$600	$0	$0	$0	$0	$957	$655
12	$371	$1,500	$0	$0	$0	$0	$1,871	$1,238
13	$386	$600	$0	$0	$0	$0	$986	$630
14	$402	$1,500	$0	$0	$0	$0	$1,902	$1,175
15	$418	$600	$0	$0	$0	$0	$1,018	$608
16	$435	$1,500	$0	$0	$0	$0	$1,935	$1,116
17	$452	$600	$0	$0	$0	$0	$1,052	$586
18	$471	$1,500	$0	$0	$0	$0	$1,971	$1,061
19	$490	$600	$0	$0	$0	$0	$1,090	$567
20	$509	$1,500	$0	$0	$0	$0	$2,009	$1,010
Total								$35,284
Salvage Value after 20 years			$405,000					
Present worth of salvage value			($203,539)					

For Alternative *3*, the present worth costs are summarized as follow:

Item	Alt 3 Gravity Sewer	Alt 3 Lift Station
Project Costs	$1,270,000	$984,000
PW of Annual Costs	$11,343	$35,284
Salvage Value	$-510,607	$-203,539
Total Present Worth Costs	$770,736	$815,745

There are other considerations with this alternative. The gravity sewer option will have up to 29 initial users. This means that there would be revenue from the potential 29 users. The revenue would be sufficient to pay for treatment, administrative, etc. plus include some capital improvement costs that would offset the present worth costs. There would be non-cost benefits such as the removal of more failing septic tanks in the gravity sewer option for an environmental benefit.

5.0 EVALUATION OF ENVIRONMENTAL IMPACTS

The following sections cover environmental impacts from the project in the study area.

5.01 DISTURBED/ UNDISTURBED LAND

The project will take place primarily in disturbed land. The project is located within highway and street right of way and on private easements. The work in private easements are in areas previously disturbed with the development of residencies etc.

5.02 HISTORICAL, ARCHITECTURAL, AND ARCHEOLOGICAL SITES

There is one historical site, Crosley Cemetery, located in the annexation region. The historical site, located east of SR 7, is noted in figure 5.02-2 as CR-40-25. This cemetery has 1visible grave marker. Figure 5.02-1is a ground photo taken looking NW (direction of photo also noted in figure 5.02-1). This picture shows the grave's position relative to the building. There is no construction near the cemetery. The cemetery will be unaffected by construction.

Figure 5.02-1

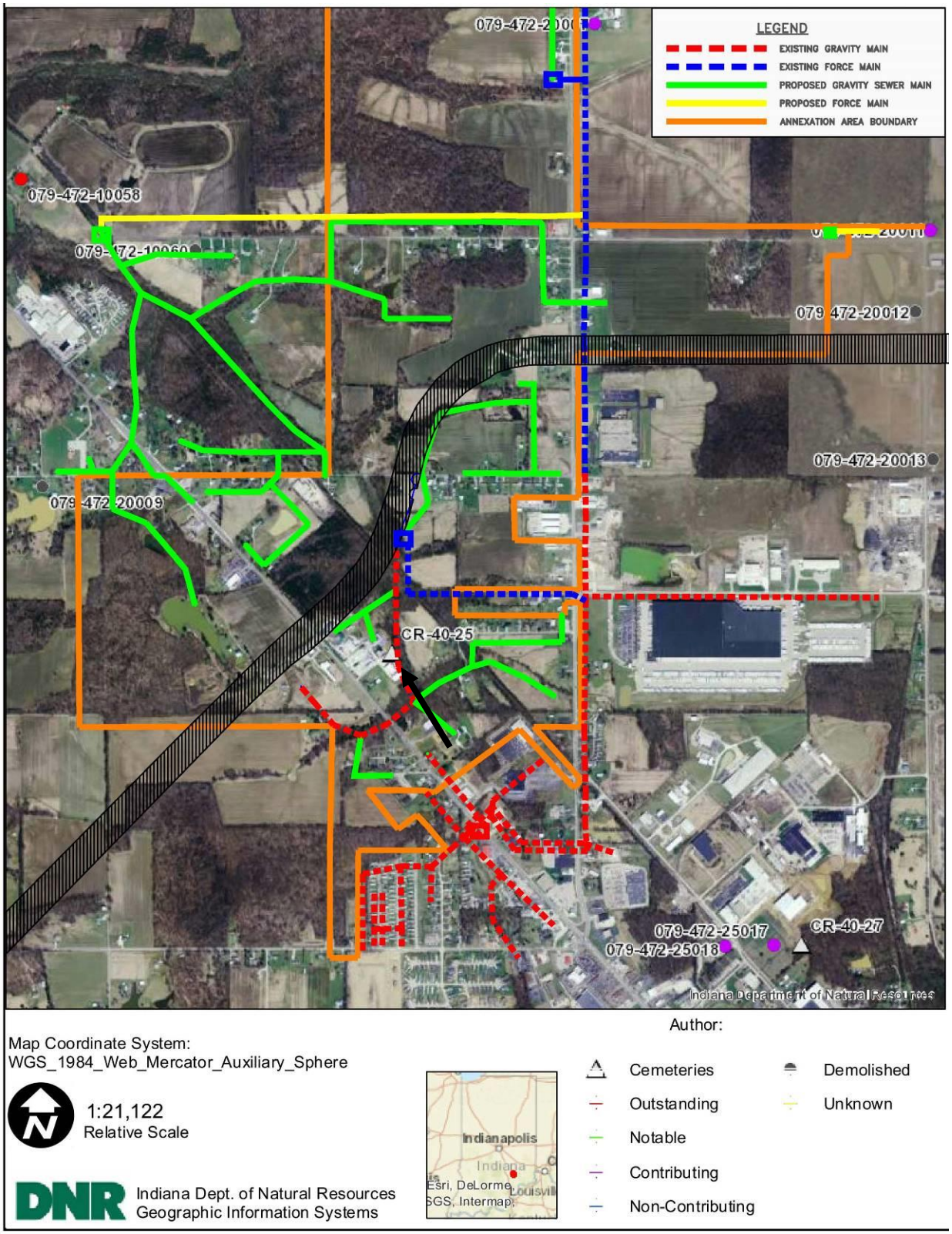

LEGEND
EXISTING GRAVITY MAIN
EXISTING FORCE MAIN
PROPOSED GRAVITY SEWER MAIN
PROPOSED FORCE MAIN
ANNEXATION AREA BOUNDARY
079-472-10058
079-472-20012
079-472-20013
079-472-20009
CR-40-25
079-472-25017
079-472-25018
CR-40-27
Indiana Department of Natural Resources
Author:
Map Coordinate System:
WGS_1984_Web_Mercator_Auxiliary_Sphere
1:21,122
Relative Scale
Indiana Dept. of Natural Resources
Geographic Information Systems
Indianapolis
Indiana
Esri, DeLorme, SGS, Intermap,
Cemeteries
Outstanding
Notable
Contributing
Non-Contributing
Demolished
Unknown

Figure 5.02-2

5.03 WETLANDS

It is anticipated that there will be no negative or only temporary impacts to the wetlands during the construction of the proposed project. Any mitigation measures to lessen wetland impacts cited in the comment letters about the project from the Indiana DNR and the U.S. Fish and Wildlife Service will be implemented. Figure 5.03-1 shows the proposed routes and structure locations for the proposed improvements on the appropriate fish and wildlife service national wetlands inventory map.

It is anticipated that a short length of gravity sewer may encroach a wetland near CR350N at the northwest corner of the study area. Any crossing of a designated wetland would be done in conformance to the nationwide permit 12 for utility type crossings. Essentially soil materials and vegetation would be replaced where the utility crosses through wetland area.

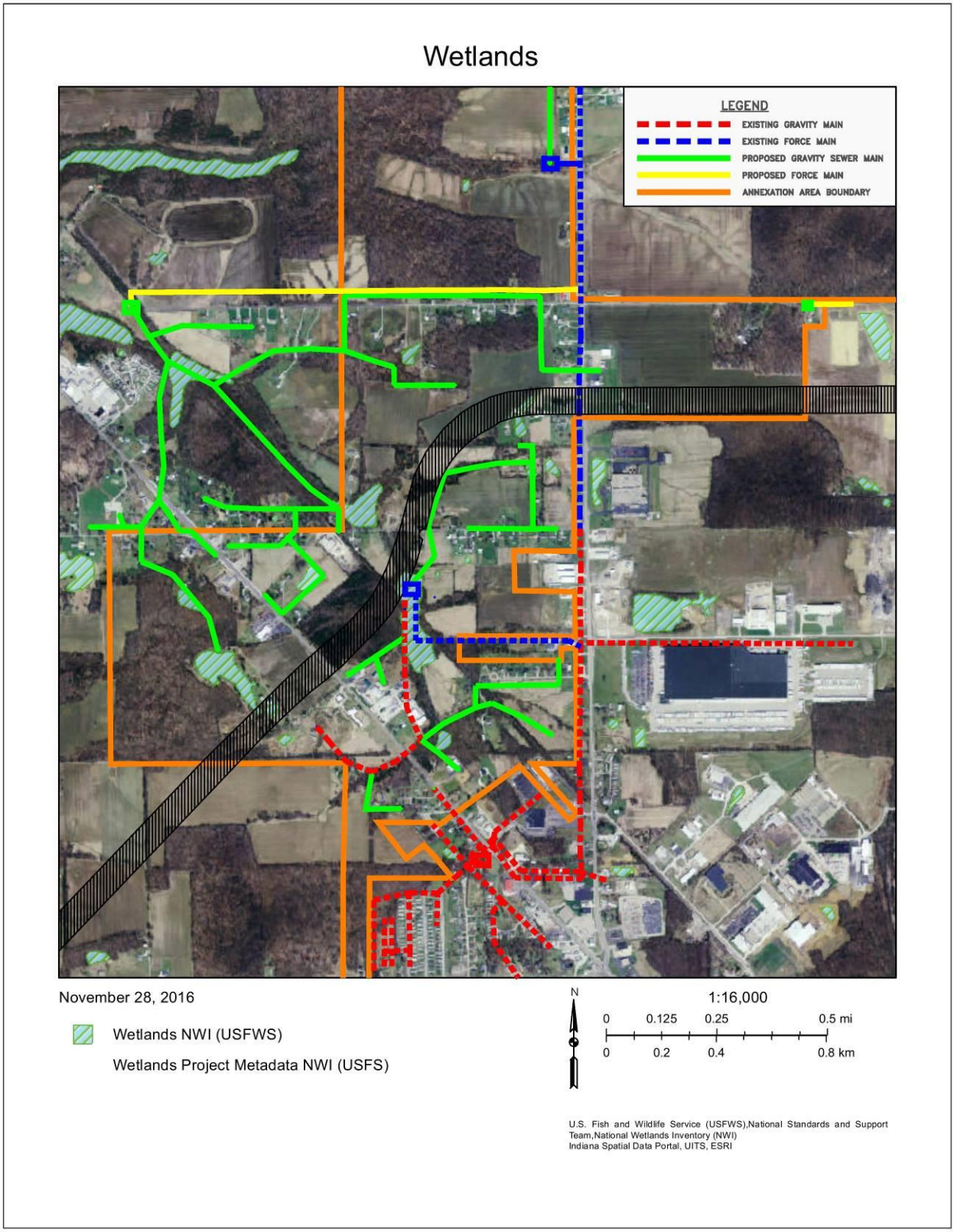


Figure 5.03 Wetlands

5.04 SURFACE WATERS

The project does not include any, nor will it adversely affect any Exceptional Use Streams, Outstanding State Resource Waters, or Natural and Scenic Recreational Rivers and Streams. Due to the size of the construction corridor which is believed to be greater than one acre of disturbed area, an NPDES erosion permit will likely be required for the construction.

Refer to figures 5.03 and 5.04 for streams, lakes, and wetlands in the project area.

5.05 GROUNDWATER

The project areas contain no sole source aquifers. The affected groundwater resources in the area occur mostly in fissured rock wells. Groundwater is not expected to be near the surfaces throughout the year with a season high water table approximately 30 feet below grade. Temporary impact on the unconsolidated groundwater may occur during the construction of the various sewer lines and structures.

The project area is serviced by Jennings water, Inc. There are no known wells being used in the study area.

5.06 100-YEAR FLOOD PLAIN

No floodplains will be adversely affected by the proposed sewer. Figure 5.06-1illustrates the proposed sewer improvements on the appropriate Jennings County Flood Insurance Rate Map. There are no large tributaries in the study area. The area consists primarily of ditches. The nearest designated creek is Six Mile Creek which is noted to start just north of the study area. The ditches and tributaries in the study area flow into Six Mile Creek due to the limited size of ditches and tributaries within the study area there are no 100 year flood designations shown in the study area.

There are no direct efforts of the project for increased runoff which could affect the 100 year flood area outside of the study area. The surface area disturbed by the construction will be returned to pre-existing conditions, except for the small area encompassing lift station(s) (approx. 30’ by 40’ areas). The study area is within the jurisdiction of the Jennings County area plan. Any proposed developments within the study area must be in compliance with the area plan requirements including storm water runoff.

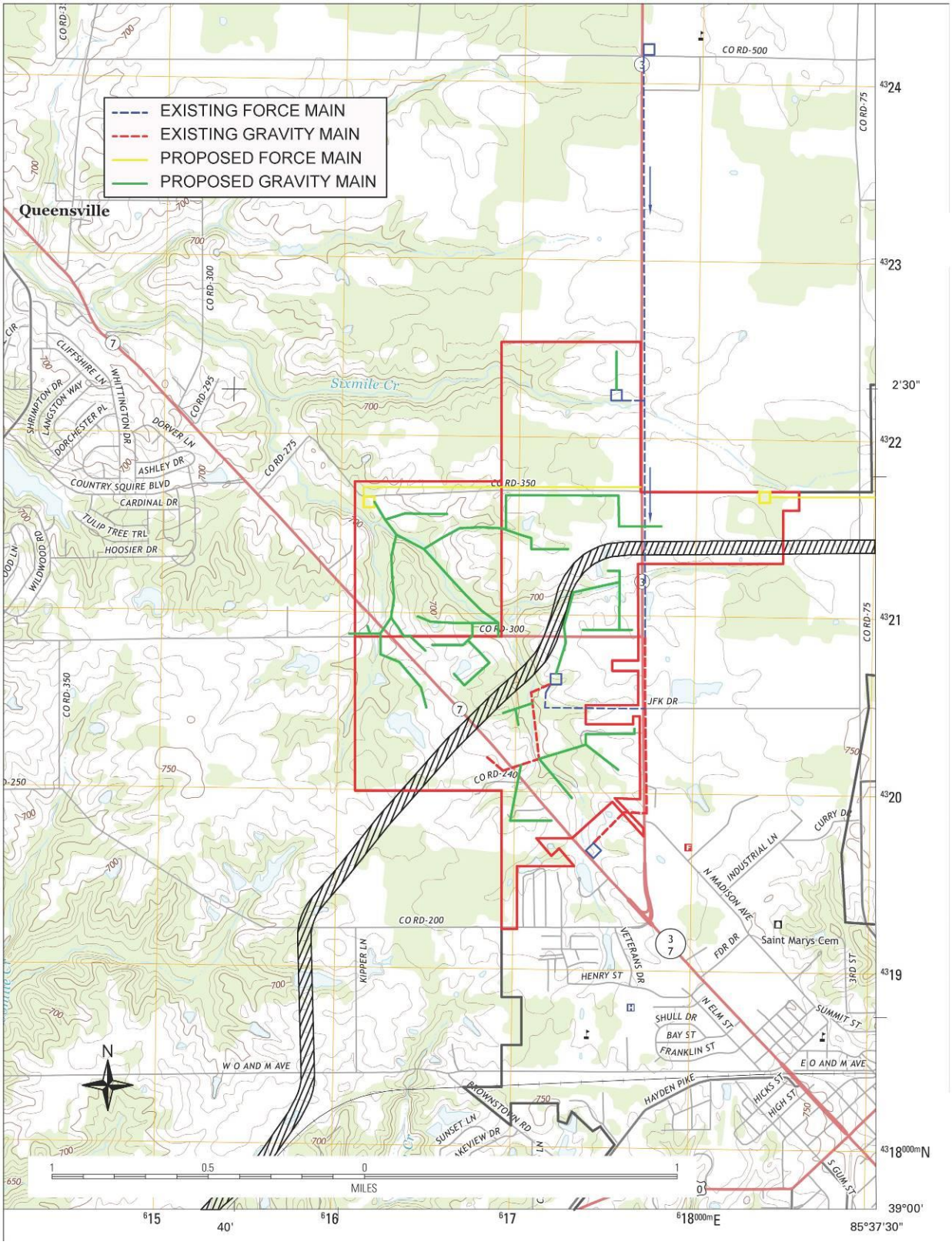


Figure 5.04 Surface Water

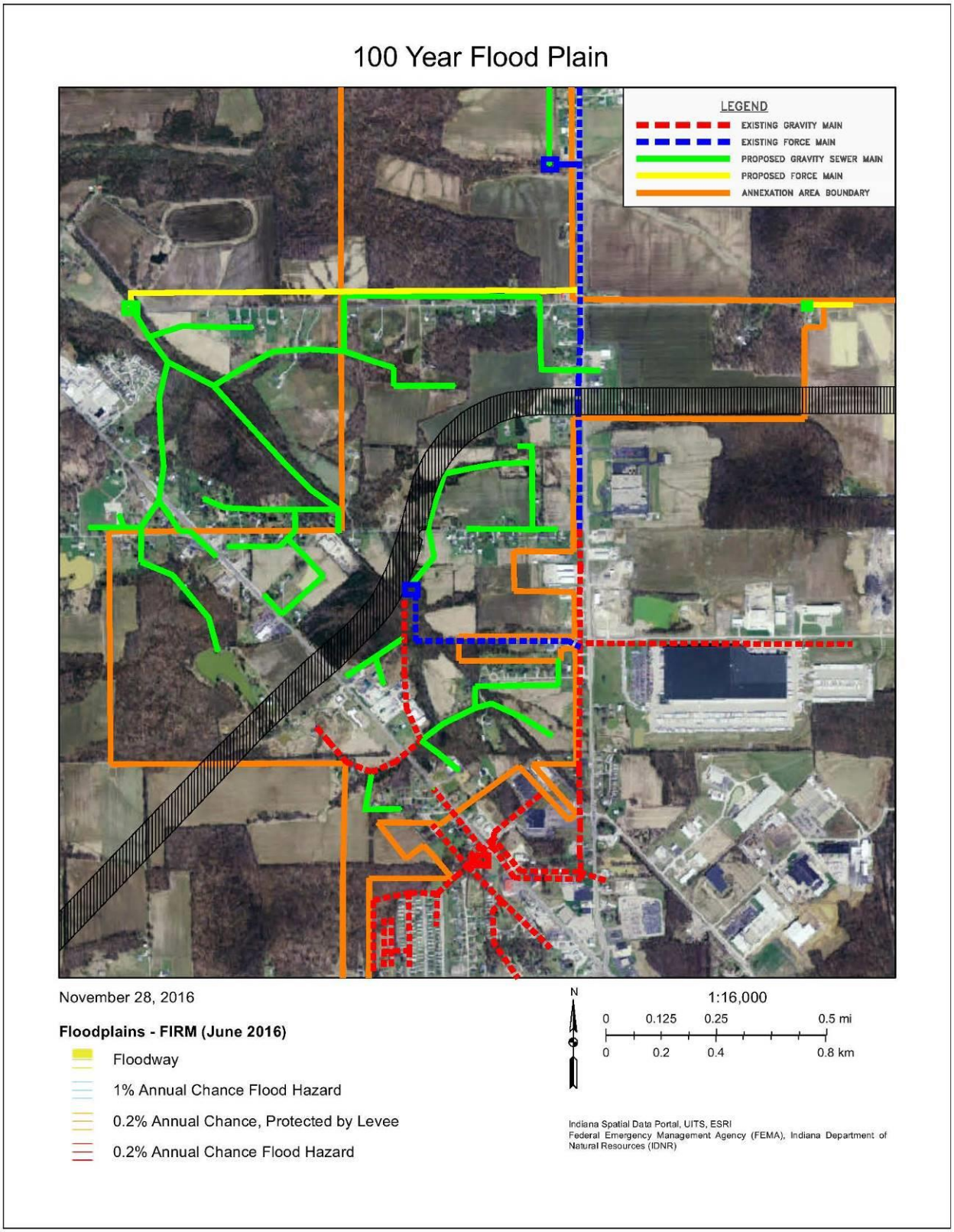


Figure 5.06 100 Year Flood Plain

5.07 PLANTS AND ANIMALS

It is not anticipated that the construction of any of the proposed projects will have any negative impacts on plants and animals. Except for the lift station site(s) (30'x40'), the surface area will be returned to the preexisting condition.

5.08 PRIME FARMLAND

There will be minimal impacts on prime farmland. The area has limited crop production. No prime farmland is anticipated to be removed by the construction of the project. The construction may create a temporary disturbance during the installation of the sewer which will be restored upon project completion. Dependent upon the time of year the construction may or may not impact crop production.

There are no known karst formations in the study area. Due to the relatively shallow depth of the sewer, the project is not anticipated to adversely impact bedrock. Some sections of sewer may require bedrock (limestone or shale) to be removed for the proper depth of the sewer. As the sewer is installed in narrow trenches and at shallow depths, no adverse impacts are anticipated. Due to the surface development of residences, etc. in the study area and proximity to adjacent residences, industries, etc., then future mining of the bedrock is not anticipated.

5.09 AIR QUALITY

There will be some dust during the construction of the sewer improvements. Mitigation measures will be taken to minimize dust initiated be these construction activities. Air quality will not be permanently impacted by the project, but may have temporary impacts due to the construction. The project does not create any permanent exhaust from combustion.

5.10 OPEN SPACE AND RECREATIONAL OPPORTUNITIES

Construction and operation of the proposed projects will neither create nor destroy any open space or recreational opportunities. Mitigation measures will be taken by the contractor during construction in order to minimize erosion and ground disturbance by these construction activities.

5.11 LAKE MICHIGAN COASTAL MANAGEMENT ZONE IMPACTS

The project areas do not lie within the extents of the Lake Michigan Coastal Zone; therefore, no negative impacts exist.

5.12 NATIONAL NATURAL LANDMARKS IMPACTS

The construction and operation of the proposed projects will not impact any National Natural Landmarks.

5.13 MITIGATION MEASURES

No long-term negative erosion, siltation, air quality, or odor impacts are expected from this project. Short-term erosion and siltation impacts will be controlled and monitored by the contractor during the installation and construction of the water improvements. A NPDES construction permit will be obtained and requirements imposed on the contractor. Other mitigation measures required by government agencies will be incorporated into the project.

5.14 INDUCED IMPACTS

The City of North Vernon will ensure, through local zoning laws or other means, that the future development, as well as future conveyance, storage, or sewage treatment works projects connecting to SRF-funded facilities will not adversely impact wetlands/archeological /historical/structural resources, or other sensitive environmental resources. The city will require new development and treatment works projects to be constructed within the guidelines of the U.S. Fish and Wildlife Service, DNR, IDEM, and other environmental review authorities.

6.01 SELECTED WASTEWATER PLAN

For this project, alternative layouts in three separate areas were studied for feasibility. All alternatives compared had wastewater flow in a gravity sewer segment versus lift. Cost analysis' were done one each separate area over the course of 20 years in a present worth format.

For alternative 1, SR 3 and CR 300N area, the gravity sewer option was chosen as opposed to reducing the length of gravity sewer by adding a lift station. This plan was chosen due to a lower installation and operation cost resulting in a lower present worth cost.

Alternative 2 examined the SR 3 and CR 350N area. For this area, the lift station option, was chosen as opposed to a long gravity sewer. While the lift station will have a higher cost of operation this cost is offset by a lower installation price resulting in a lower present worth cost. Note that this lift station was constructed for a development and is not included in the project. The analysis provided for a coordinated plan to benefit the study area.

Alternative 3 examined an area from 300N to 350N east of Highway 7. Plan A, gravity sewer option, was chosen for this area. The alternate plan included using 3 lift stations to keep from installing gravity sewer outside of city limits. While plan A had a higher initial installation cost this was offset by the operation and maintenance cost of 3 lift stations resulting in a lower present worth cost for plan A.

6.02 PLAN PHASING

It is not anticipated that project phasing will be needed or desirable for the project.

6.03 PRELIMINARY DESIGN SUMMARY

The proposed project does not require the existing treatment facility to be expanded as adequate treatment capacity is available to serve the proposed project area. The existing collection system is also adequate for the transportation of wastewater flow from the study area to the treatment facility.

The project generally consists of the installation of gravity sewer service connection to the gravity sewer, two lift stations and force mains to connect the study area into the existing collection system.

All proposed gravity sewers will be 8 inch diameter which is the smallest diameter approvable by the agency. 8 inch diameter is also adequate to handle the project wastewater flow from the study area. The sewers will be laid at the required slope to serve the area and meeting the required minimum slope per agency's requirements.

One lift station is being installed for a very small service area and will be a grinder type lift station due to the limited flow rate. Due to the topography of the area should the future wastewater system expand north of CR 350N and east of SR3, then this lift station would be abandoned and placed on gravity sewer. The force main sizing for this lift station is 2 inch diameter due to the anticipated pumping rate of 23 GPM along with the length of the proposed force main to limit head loss. The design is to maintain 2 feet per second velocity in the force main.

One lift station will collect flows from about ½ of the study area. This lift station will be a standard type lift station with pumps to handle the wastewater solids. The force main for this station is 4inch diameter, the minimum for a standard lift station. The pump flow rate is 85 GPM to keep two feet per second velocity in the force main.

Connections (service WYES) will be provided for each existing wastewater producing property. The location of the WYE on the gravity sewer will be coordinated with each property owner. The property owner will be required to abandon the onsite system in accordance to agency's requirement and connect to the proposed collection system. With the exception of providing the service WYE for each property, the property owner is responsible for cost and installation in accordance to the city's specification for the service line. The services are not included in the funding for the project and no easements are required by the city for the services.

Manholes used in the project will be standard 4 feet diameter pre-cast concrete manholes with depths to maintain proper grade for the gravity sewer.

6.04 SCHEMATICS/LAYOUT/MAPS

Figure 6.01 shows the layout including all selected alternatives.

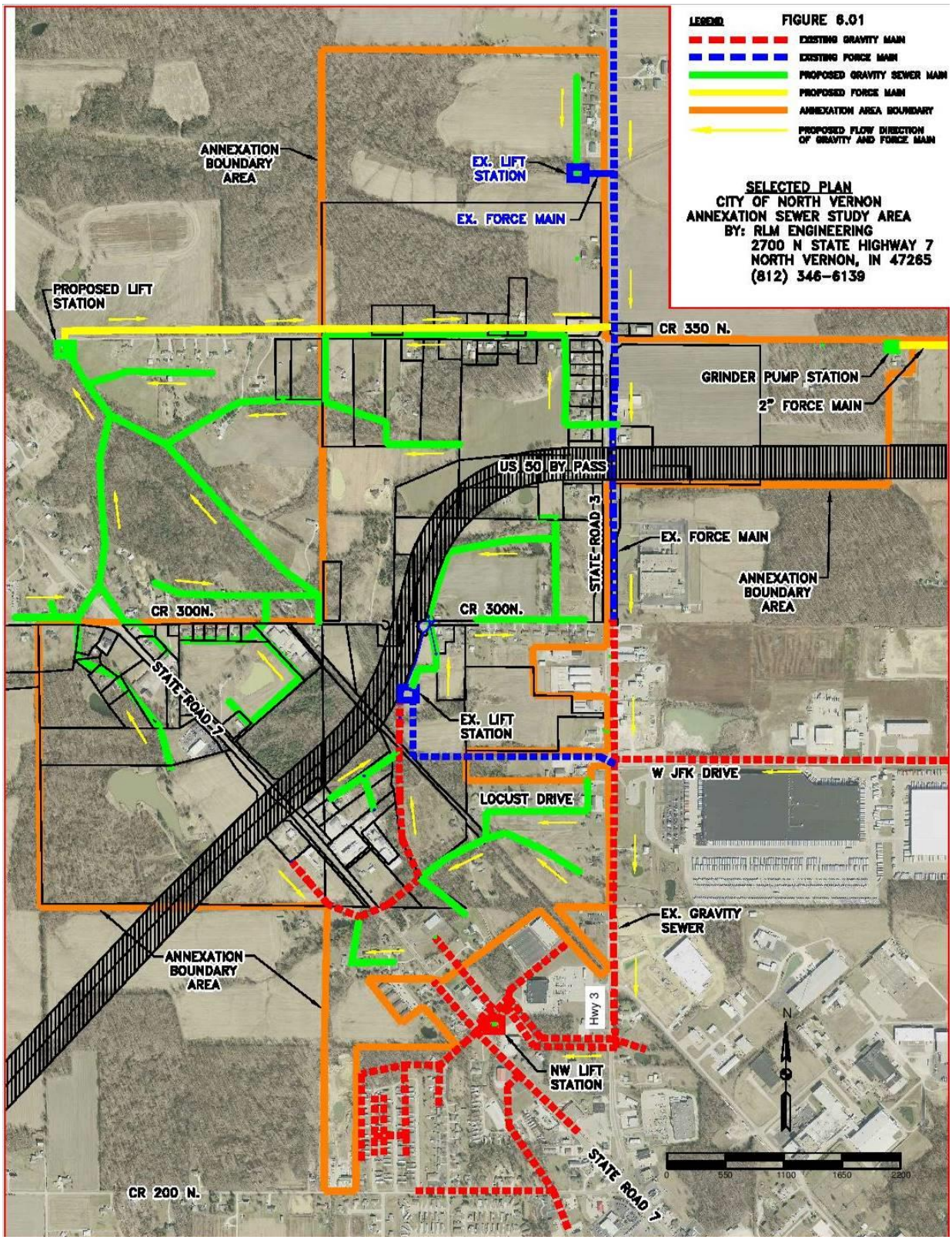


Figure 6.01 Selected Plan

6.05 SELECTED PROJECT PAN COSTS AND USER RATES

Table 6.05 identifies the project components of the selected plan with an opinion of construction cost. Non-construction costs are also itemized.

Table 6.05 opinion of the selected project cost

Item		Quantity	Unit Cost	Item Total
0-6 Feet Depth Gravity Sewer		12700	$39.00	$495,300.00
6-8 Feet Depth Gravity Sewer		8500	$43.00	$365,500.00
8-10 Feet Depth Gravity Sewer		6100	$49.00	$298,900.00
10-12 Feet Depth Gravity Sewer		4400	$55.00	$242,000.00
12-14 Feet Depth Gravity Sewer		1000	$60.00	$60,000.00
14-16 Feet Depth Gravity Sewer		350	$65.00	$22,750.00
16-18 Feet Depth Gravity Sewer		350	$70.00	$24,500.00
18-20 Feet Depth Gravity Sewer		500	$80.00	$40,000.00
20-22 Feet Depth Gravity Sewer		500	$95.00	$47,500.00
22-24 Feet Depth Gravity Sewer		200	$110.00	$22,000.00
24-26 Feet Depth Gravity Sewer		150	$125.00	$18,750.00
26-28 Feet Depth Gravity Sewer		200	$140.00	$28,000.00
Drop for manhole		6	$1,000.00	$6,000.00
0-6 Feet Depth manhole		51	$3,400.00	$173,400.00
6-8 Feet Depth manhole		20	$3,700.00	$74,000.00
8-10 Feet Depth manhole		19	$4,200.00	$79,800.00
10-12 Feet Depth manhole		7	$5,000.00	$35,000.00
12-14 Feet Depth manhole		4	$5,800.00	$23,200.00
14-16 Feet Depth manhole			$6,800.00	$0.00
16-18 Feet Depth manhole		1	$7,800.00	$7,800.00
18-20 Feet Depth manhole		1	$9,000.00	$9,000.00
20-22 Feet Depth manhole		3	$10,200.00	$30,600.00
22-24 Feet Depth manhole		1	$11,500.00	$11,500.00
24-26 Feet Depth manhole			$13,000.00	
Pavement repair Sewer		1800	$50.00	$90,000.00
Pavement repair		800	$35.00	$28,000.00
Drive repair		400	$20.00	$8,000.00
Service connection		133	$200.00	$26,600.00

6" service line		3100	$25.00	$77,500.00
16" casing Hwy bore w/ 8" sewer		410	$150.00	$61,500.00
Lift Station w/ valve pit #2		1	$150,000.00	$150,000.00
4" Force Main		5200	$17.00	$88,400.00
12' wide access drive		100	$12.00	$1,200.00
Fencing/site work		1	$5,000.00	$5,000.00
Electrical		1	$5,000.00	$5,000.00
Connection to existing valve		1	$500.00	$500.00
Lift Station w/ valve pit #4 grinder		1	$30,000.00	$30,000.00
2" Force Main		1100	$15.00	$16,500.00
12' wide access drive		100	$12.00	$1,200.00
Fencing/site work		1	$3,000.00	$3,000.00
Electrical		1	$2,000.00	$2,000.00
2in plug valve		1	$500.00	$500.00
Connection to existing valve		1	$1,000.00	$1,000.00
Highway bore with casing & 4in PVC force main		150	$100.00	$15,000.00
Pavement repair		450	$30.00	$13,500.00
Driveway repair		200	$20.00	$4,000.00
Subtotal				$2,743,900.00
Construction contingency		10%		$274,400.00
Total construction cost				$3,018,300.00
Non-Construction Costs				
Engineering, design, bidding, contract admin.				$275,000.00
Inspection				$220,000.00
Survey- booster site/topographic/etc.				$45,000.00
Land				$10,000.00
Permits				$5,000.00
Legal/easement documents				$30,000.00
Soil exploration				$15,000.00
Easement acquisitions				$100,000.00
Easement preparation assistance				$25,000.00

other/misc.				$25,000.00
Funding/Bond Counsel				$120,000.00
Total non-construction cost				$870,000.00
Total estimated project cost				$3,888,300.00

The project requires that a loan be obtained. The city is pursuing the use of state revolving loan funds (SRF) for the project financing. SRF considers some items as ineligible for funding. For this project, the ineligible items include land and easements. The ineligible cost will be funded from existing wastewater department funds.

Total Project costs	$3,888,300.00
Ineligible costs	$110,000.00
Eligible costs	$3,778,300.00

The London Witte Group (LWG) are providing rate consulting services for the utility services board. A preliminary review was made by LWG for estimating user rates, LWG assumed potential SRF loan rate increases prior to loan closing. The total amount being financed was also increased for a conservative value along with project increases to existing budget items. The user rate projected by LWG should be considered as conservative (high side) and are as follows.

Potential minimum	3,000 gallons	$34.28
Potential Average	4,000 gallons	$42.57
2017 average rate	4,000 gallons	$35.99
Increase over 2017 rates per month		$6.58
Estimated amount of increase due to the project		$4.21

Of the proposed rate increases, 64% was attributed to the project.

An effort is also underway to seek funding assistance from the North Vernon Redevelopment Commission. Depending upon the amount of assistance, it is possible that the funding costs may be negated by the funding assistance. The additional user fees from new users are also considered to offset any increase in operational maintenance for the new users. Therefore, the rate increase may be from $0.00 to $4.21 per month for the average user due to the project. The actual rate increase would be finalized after the bids for the project and closing and the financial assistance is determined.

6.06 PROJECT SCHEDULE

The following are considered as estimated dates for the proposed project milestones.

PER Submittal	March 30, 2017
Anticipated PER Approval	April 30,2017
Plans & Specs Submittal	November 1, 2017
Plans & Specs Approval	December 1, 2017
Land & Easement Acquisition Completion	Jan 1, 2018
Advertise for Bids	Jan 15, 2018
Loan Closing	March 15, 2018
Contract Award	March 15, 2018
Initiation of Construction	April 15, 2018
Substantial Completion of Construction	March 15, 2019
Initiation of Operation	April, 15, 2019

6.07 PROJECT OPERATION

The City North Vernon operates its existing facilities and has the personnel on staff and proper methods in place for the operation of the plant.

It is noted that operation will begin once users connect to the system and the related lift station is operational. All users would be required to connect once the collection system has been completed.

The project is a very minimal increase to the existing wastewater system flows and as such will not require additional personnel to be obtained by the wastewater department to operate and maintain. The necessary personnel are in place to incorporate this project along with the necessary treatment functions including sludge handling, sludge disposal and laboratory services. There is no need for separate contract services for this project.

6.08 GREEN PROJECT RESERVE

As the project consists of gravity sewers with lift station and force mains to extend the existing wastewater service area, then Green Project Reserve does not apply to the project.

7.0 LEGAL, FINANCIAL & MANAGERIAL CAPABILITIES

Resolutions are included in the appendix to indicate the authorized representative and the acceptance of the PER.

As the proposed project is an expansion of a service area, the owner (City of North Vernon) has existing personnel, legal, methods, financial, and managerial capabilities in place to conduct the project. As the City has provided wastewater treatment operation etc. for several decades expanding the service area creates no unusual issues. The city has as established utility services board which includes the wastewater department and will oversee the proposed project. The utility services board meets twice per month to propel management, oversight, and response to the users. The wastewater department includes a wastewater superintendent and personnel to oversee the operation.

The existing user fee system is appropriate for the project as well as the existing sewer use ordinance. The Utility includes a billing office to invoice & collect the user fees. Other financial assistance is provided by the city clerk's office and the department's annual budgets are approved by the city council.

The city of North Vernon has a fiscal sustainability plan in place has obtained other state revolving loan funds for wastewater related projects. The FSP certification form in included in the appendix.

8.0 PUBLIC PARTICIPATION

A public hearing for the proposed project was held on March 13 2017. A sign-in sheet and minutes of the meeting are included. Written comments that were received are included. A handout was prepared and provided at the meeting which is included.

Appendix

Handout for Public Hearing
2017 City of North Vernon
Wastewater Service to North Area of City
March 13, 2017 Meeting Date

Overview

The City of North Vernon annexed an area adjacent to its north boundary in 2015. The area is currently served by on-site septic systems. The City desires to construct a gravity sewer sanitary wastewater collection system in the annexed area in keeping with the provisions for gravity sewers in the City. The Report prepared for the Annexation indicated that a gravity sewer collection system would be installed due to the Annexation.

This project considers only wastewater utility service. For instance, the water service will be continued to be provided by the current water provider.

The area like much of Jennings County has soils that are not effective for use as on-site absorption fields. The Jennings County Health Department has provided a support letter to indicate that on-site systems have failed in the area and that a community collection system should improve the environment in the area.

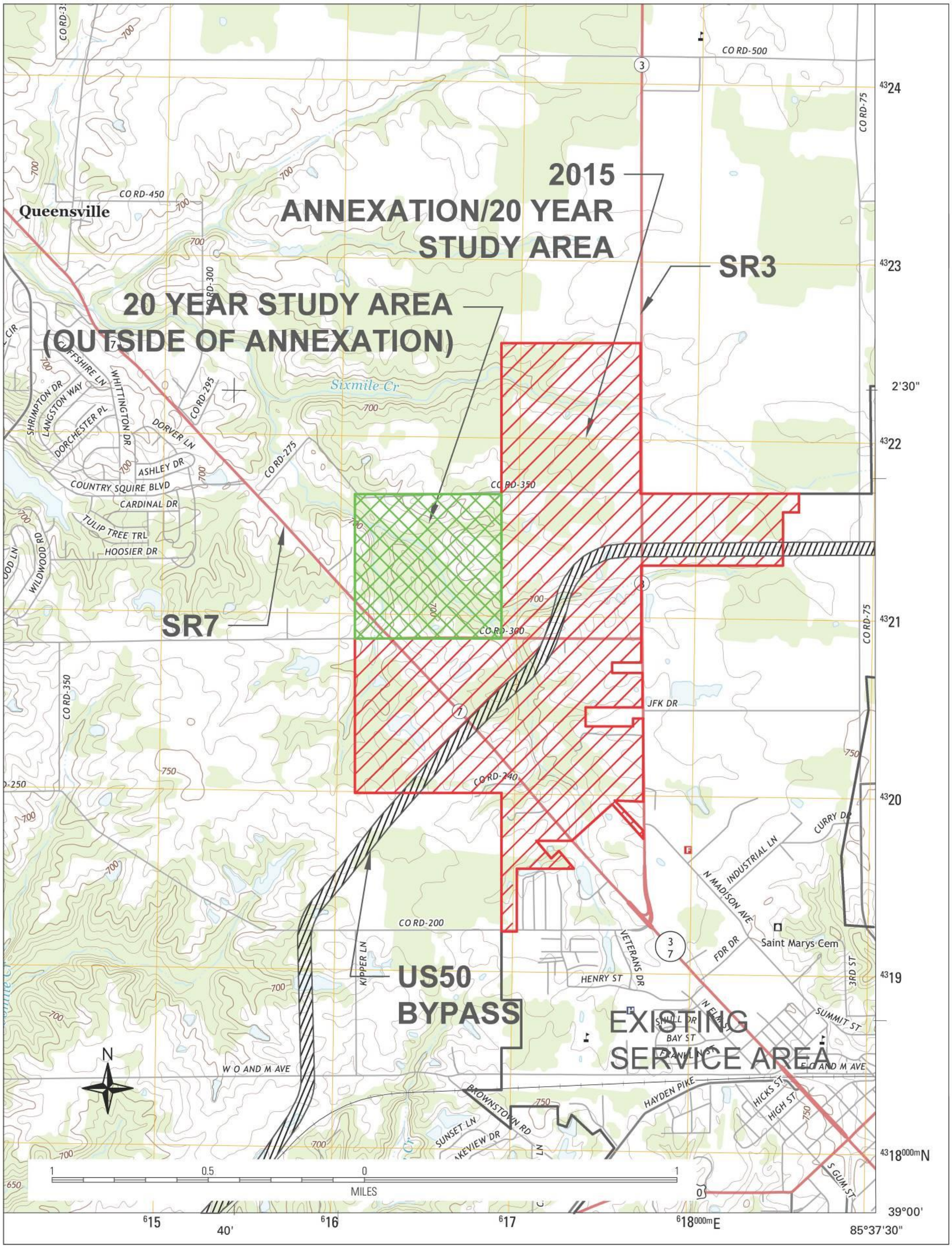
Due to the cost of the project, various agencies were reviewed for financing of the project. For various factors, no grant funds are available for the project. The project is proposed to be financed by the Indiana Finance Authority (IFA) through the State Revolving Loan Fund (SRF) program. The SRF funding was determined to be the best financing alternative for the City for this project. The City has utilized the SRF program recently for another project.

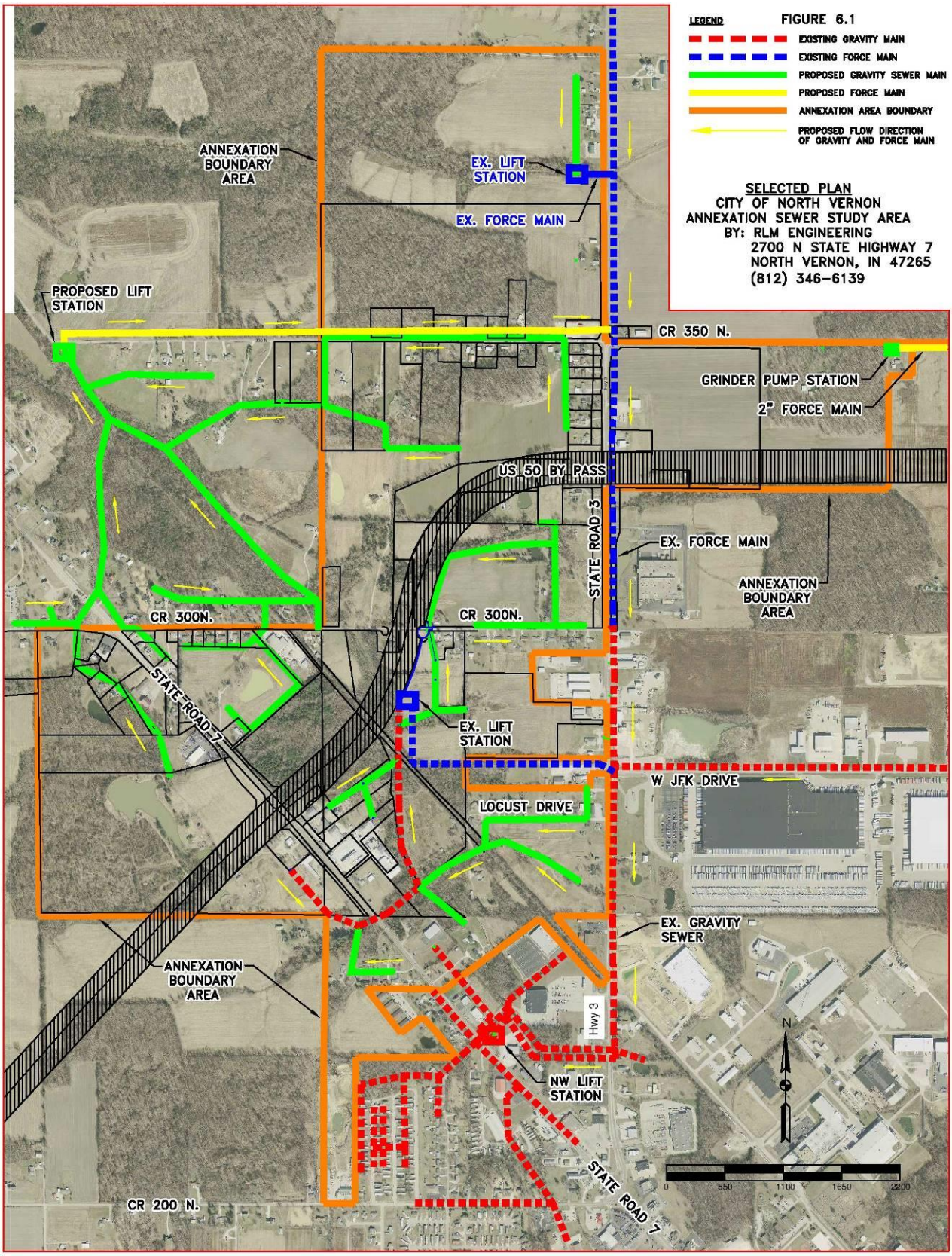
The funding process requires that a Preliminary Engineering Report (PER) be prepared for the project meeting the guidelines of the SRF program. The Public Hearing is to relay information from the PER to the public and to gather comments from the public.

Project Area

A Study Area was determined for the project. The Study Area includes an area outside of the Annexed Area. The reason an area outside of the City's boundary was included was for technical or design reasons. The alternative analysis section of the report determined that including the area is beneficial with the long term costs being reduced and more on-site systems being removed. The Study Area is shown on Figure 1.02.

There are two projects underway in the Project Area concerning wastewater collection. One is a construction project near SR 7 south of the US 50 bypass (SR 750). A project to provide sanitary sewer for a development at the southwest corner of the intersection of SR 7 and SR 750 is in construction. The configuration of the project will benefit the nearby area as the layout being planned for the PER was used. A second project is installing a lift station for the industry along SR3. The lift station will be used for servicing the nearby area. Both of these projects are funded by other means and are not included in the PER. However, both projects are helpful in providing wastewater service to portions of the Study Area.


2015
ANNEXATION/20 YEAR
STUDY AREA
SR3
20 YEAR STUDY AREA
(OUTSIDE OF ANNEXATION)
SR7
US50
BYPASS
EXISTING
SERVICE AREA
Queensville
Sixmile Cr
CO RD-500
CO RD-450
CO RD-350
CO RD-300
CO RD-275
CO RD-240
CO RD-200
CO RD-75
JFK DR
HENRY ST
VETERANS DR
KIPPER LN
N MADISON AVE
INDUSTRIAL LN
CURRY DR
FDR DR
Saint Marys Cem
SUMMIT ST
W O AND M AVE
HAYDEN PIKE
BROWNSTOWN RD
SUNSET LN
HICKS ST
HIGH ST
S GUM ST
COUNTRY SQUIRE BLVD
CARDINAL DR
TULIP TREE TRL
HOOSIER DR
ASHLEY DR
DORVER LN
WHITTINGTON DR
DORCHESTER PL
LANGSTON WAY
SHRIMPTON DR
WILDWOOD RD
MILES
N
39°00'
85°37'30"
2'30"
40'



Planned Project

Figure 6.1 indicates the selected plan. Figure 6.1 is an aerial map of the project area with the proposed locations of the gravity sewers, lift stations, and force mains. The project will install approximately

35,000 feet of 8 inch gravity sewer, 107 manholes, 5200 feet of 4 inch force main, one 85 gpm lift station, one grinder pump station, 1100 feet of 2 inch force main, the necessary pavement repairs, road bores, etc. for 133 service connections.

The proposed improvements will connect to the existing collection system. The existing collection system has adequate capacity to receive the wastewater flows and get the flow to the wastewater treatment facility. The wastewater treatment facility also has the capability to treat the additional flow.

The total construction cost of the project is estimated at $3,018,300.00. Non-constructions are estimated at $870,000.00 with the total project cost estimated at $3,888,300.00. There are some costs that are not eligible for funding which means that about $3,778,300.00 will need to be financed.

Environmental Considerations

The requirements for the PER requires that various environmental issues be reviewed and be included within the PER. The following items were included in the PER:

- Disturbed/Undisturbed land
- Historical, Architectural, and Archeological Sites
- Wetlands
- Groundwater
- 100-year flood plain
- Plants and animals
- Prime farmland
- Air quality
- Open space and recreational opportunities
- Lake Michigan coastal management zone impacts
- National Natural Landmarks Impacts

The project should not adversely affect any of the above items. As the project does not remove any existing buildings with most of the construction taking place in residential areas and land that has been disturbed, then the projects impacts are minimal. Mitigation measures will be enacted where appropriate. The information contained in the report is reviewed by the SRF program and they make additional coordination with other agencies to determine whether additional mitigation measures are appropriate.

Project Schedule

The project is at the Public Hearing stage. The public hearing process is complete once the comment period is over and the summary of the public hearing process and comments are included into the PER. Any changes to the PER by the Utility Services Board and City Council are then added to the PER. The City Council provides a PER acceptance resolution and then the PER is forwarded to the SRF program for review.

SRF reviews the PER, conducts interagency environmental coordination, provides comments, and approves the PER.

Once the PER has been approved, then design, easement acquisition, permits, etc. are completed. After plan approval by IDEM, the project will be advertised for bids. After the receipt of bids, the project

budget is revised (and along with other documents being completed), then the loan is closed. Construction of the project cannot begin until the loan is closed.

The construction of the project will take 9 to 12 months to complete. However, some portions of the proposed sewer will be available for use prior to the final completion.

Financial Information

The project is proposed to be funded through the Indiana SRF. The SRF is 20 year financing. London Witte Group (LWG) is a financial firm that worked on the recent SRF funding for the wastewater treatment facility improvements. LWG provided a review of the potential financing costs and wastewater department budget to determine the effect on user's rates.

LWG used a very conservative approach in assuming what the users rates may be with the project. The interest rate for the project will not be established until the loan is closed on the project which is after the project has been bid. With this possibly being a year away, the interest rate used was increased over the current rate that is in effect. The length of the loan is 20 years. LWG also used a slightly higher project cost in the rate analysis to provide a conservative (or high side) amount for the potential rate increase. In addition, the wastewater annual budget was increased for potential inflationary factors.

Efforts are also being made to enlist the North Vernon Redevelopment Commission to aide in making the loan payments. Any funding by the NVRC on the annual loan payment will offset any rate increase needed.

Until loan closing and a determination by NVRC, the final rate increase cannot be determined. LWG analysis can be considered a worst case scenario. Their results indicate that the residential wastewater rate would increase by $5.32 for the minimum bill (less than 3000 gallons per month) and by $6.58 for an average usage of 4000 gallons per month. Of the PER project related items, the attributed increase due to the project would be $3.40 for the minimum monthly bill and $4.21 for the average monthly bill.

Since the amount of assistance by NVRC has not been determined and the analysis includes inflation factors to the budget, then it is possible that no or little rate increase may be needed. Therefore, a rate increase from $0.00 to $5.32 for the minimum bill and $0.00 to $6.58 for the average bill is the forecast from the financial analysis for what the wastewater department may need once the loan is closed for the PER project.

Project Area Items of Interest for Property Owners

The following contains information for property owners in the Project Area concerning easements, service line construction requirements, and costs for connecting to the proposed sewer system.

What do we need easements for?

Generally, we need easements for the construction of sewers, manholes, force mains, and access drives to the lift stations. Lift stations sites are not constructed in easements, but are titled transferred to the Utility. Some locations will be in existing street right-of-way, but due to the location of other utilities, etc., most locations for this project will be in easements. Easements may be purchased, but the property owner may donate the easement.

What size are the easements?

A permanent easement of 20 feet wide works for most locations. The sewer main will typically be located in the center of the 20 feet wide easement. Due to the depth of excavation needed for the gravity sewer, an additional 20 feet wide temporary construction easement is typical.

What about sewer service lines to residences and businesses?

The Sewer Use Ordinance indicates that the property owner is to construct, maintain, and pay for the service lines to connect the structure to the main sewer. The Utility will provide a stub-out for each property owner to connect to. As the Utility is not constructing service lines, the Utility will not need an easement for the service lines.

Location of the connection for the service line

The property owner will be contacted during construction to determine the location desired for the connection point. The connection point will be either on the main line easement (if the building is on the same side of the street as the sewer main) or it will be at the road right-of-way (if the building is on the opposite side of the street).

The location of the service line on the individual's property is dependent upon each property owner determination as what is best for the property owner. That is, the property owner could determine that it may be better to change where the drain line exits the building or to connect to the existing pipe just outside of the building. The location where it needs to connect to on the sewer main needs to be determined prior to the construction of the main near the property.

Use of any existing buried piping will need to be approved by the Wastewater Superintendent as per the Sewer Use Ordinance. The construction and materials used for the service line must meet the construction requirements for the Utility. The Sewer Use Ordinance and Construction requirements are available on the City's Utility website at http://northvernon-in.gov/wastewater/ordinances.php

What happens to the existing septic tank or on-site system?

Indiana requires that the on-site system be abandoned properly (Referenced 410 IAC 6-8.3-90 for residential systems and 410 IAC 6-10.1-98 for commercial systems). The property owner is responsible for the abandonment and costs for abandonment of the on-site system. Basically, the procedures involve:

- removal of all power and equipment from source (if any),
- pumping and disposal of the tank(s) by licensed hauler
- Removal of the tanks or crushing the lids into the tanks and filling the tank with clean backfill
- Grade and establish vegetation
- Any effluent present on the property must be covered with hydrated lime
- The absorption field does not have to be removed, but if it is removed, then proper procedures must be followed.
- Written documentation by receipt of the contractor doing the abandonment must be provided to the Wastewater Superintendent and the county health department.
- Refer to the above IAC requirements for clarifications.

When do I have to connect to the sewer?

The Sewer Use Ordinance requires the connection to the sewer for properties within 300 feet of the sewer within 90 days of being notified by the Wastewater Department.

What are the property owner's costs?

The sewer mains, lift stations, manholes, and design will be a funded project through the Utility. The property owner will be required to construct and pay for the service line and abandonment of the on-site system. It is anticipated that most property owner's cost for the service line and abandonment will range from $1500.00 to $1800.00.

The Utility also has a tap fee of $250.00 and a capacity fee of $600.00 for a total of $850.00 for each residential connection. Non-residential fees are treated as residential equivalents for the flow of 400 gpd by building use factors.

Rates

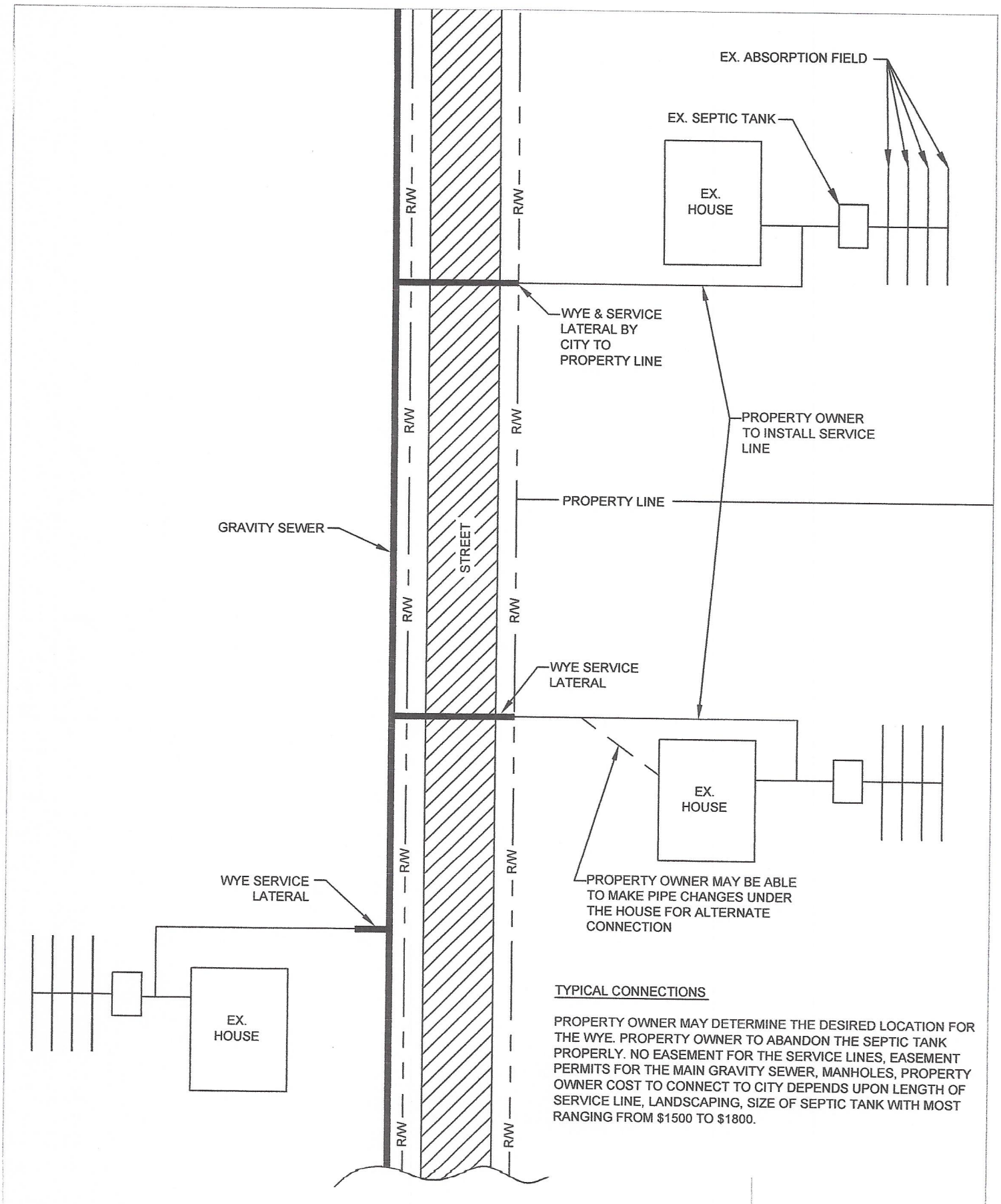
Each user will pay monthly usage rates based upon water meter readings. The rates for the annexation area will be the same as all existing customers. The current 2017 monthly rates are:

First 3000 gallons	$ 28.96 (minimum)
Next 1000 gallons	$ 7.03 per 1000 gallons
Above 4000 gallons	$ 7.03 per 1000 gallons

For example, the following indicates the billing for various amounts of usage:

Amount used	Cost	
1000 gallons	$ 28.96	
2000 gallons	$ 28.96	
3000 gallons	$ 28.96	
4000 gallons	$ 35.99	(Considered as the average residential bill)
5000 gallons	$ 43.02	
6000 gallons	$ 50.05	

The user rates after the project are dependent upon several factors, including the interest rate at the time of loan closing, inflationary factors for the existing wastewater department items, and the amount of financial assistance from NVRC. See the previous financial discussion as to how this may impact the rates.



TYPICAL CONNECTIONS

PROPERTY OWNER MAY DETERMINE THE DESIRED LOCATION FOR THE WYE. PROPERTY OWNER TO ABANDON THE SEPTIC TANK PROPERLY. NO EASEMENT FOR THE SERVICE LINES, EASEMENT PERMITS FOR THE MAIN GRAVITY SEWER, MANHOLES, PROPERTY OWNER COST TO CONNECT TO CITY DEPENDS UPON LENGTH OF SERVICE LINE, LANDSCAPING, SIZE OF SEPTIC TANK WITH MOST RANGING FROM $1500 TO $1800.

Jennings County Health Department
200 East Brown Street – Vernon, Indiana 47282
Phone: 812-352-3091 – fax: 812-352-3030

January, 1 2017

To Whom it may concern

The Jennings County Health Department is supportive of any efforts to convert existing on-site systems into a community wide sewer system. Elimination of the on-site systems would be seen as a benefit to the environment due to the number of failed systems.

The annexed area has several residences constructed in the 1960's and 1970's time period. During this time period, several jet aeration type on-site units were installed. Most of these were installed without an absorption field. The mechanical portion of the units have been failing resulting in the tanks become a septic tank rather than an aerated treated tank. The installation of a sewage collection system resolves the issues associated with maintaining obsolete equipment an lack of lot size for absorption field.

With the age of the existing absorption fields being generally over 40 years, many are failing without an area to install another field. We make efforts to modify the systems to be workable as possible and sometimes mound sand systems are constructed.

For instance, in the past several years we have had numerous complaints for failed systems. We have been able to find a workable solution (at least a temporary solution) for several of these systems.

A part of this area does not have much topographic relief and is very flat which results in some standing water hindering the ability of absorption field.

It is expected that should a collection system be installed as being proposed, that it would provide an environmental benefit outside of this area. The proposed service area drains into ditches which are the beginning of Six Mile Creek. Six Mile Creek flows into the primary lake in County Squire Lakes. Runoff from this area likely includes the effects from the failed aeration systems and absorption fields. Elimination of these should improve the downstream water quality.

I hope that funding this project is obtained as it will provide for a better environment and a healthier life for residents in Jennings County.

Sincerely,

Kenny Pearson
Kenny Pearson
Environment Health Specialist

A.

MODEL AUTHORIZED REPRESENTATIVE RESOLUTION

WHEREAS, the (PARTICIPANT) of _____, Indiana, herein called _____, has plans for a municipal water pollution control project to meet State and Federal regulations, such as the NPDES discharge limitations, and the community intends to proceed with the construction of such works:

WHEREAS, the (PARTICIPANT) has adopted this Resolution dated _____.

NOW, THEREFORE, BE IT RESOLVED by the Council/Board, the governing body of said _____, that:

1. **_____ be authorized to make application for an SRF Loan and provide the State Revolving Fund Loan Program such information, data and documents pertaining to the loan process as may be required, and otherwise act as the authorized representative of the community.**

2. **The community agrees to comply with the Indiana Finance Authority, State of Indiana and Federal requirements as they pertain to the SRF.**

3. **That two copies of the resolution be prepared and submitted as part of the community's Preliminary Engineering Report.**

ADOPTED this _____ day of _____, 2010.

THE (PARTICIPANT) OF _____, INDIANA
BY AND THROUGH ITS COUNCIL/BOARD OF TRUSTEES

AUTHORIZED SIGNATORY

_____ **BY:** _____

_____

_____

ATTEST: _____

B.
MODEL PER ACCEPTANCE RESOLUTION

WHEREAS, the (PARTICIPANT) of _____ County, Indiana, has caused a Preliminary Engineering Report, PER, dated_____, to be prepared by the consulting firm of_____; and

WHEREAS, said PER has been presented to the public at a public hearing held _____, for their comments; and

WHEREAS, the (PARTICIPANT's) Board/Council finds that there was not sufficient evidence presented in objection to the recommended project in the Preliminary Engineering Report.

NOW, THEREFORE BE IT RESOLVED THAT:

The _____ Preliminary Engineering Report dated _____ be approved and adopted by the (PARTICIPANT's)Board/Council; and
That said PER be submitted to the State Revolving Fund Loan Program for review and approval.

Passed and adopted by the (PARTICIPANT's) Board/Council this _____ day of _____, at their regularly scheduled meeting.

_____
President/Mayor

_____
Member

_____
Member

_____
Member

Attest:_____

Cost & Effectiveness Certification Form

(Pursuant to Section 602(B)(13) of the Federal Water Pollution Control Act)
(Applies to all assistance recipients submitting an application on or after October 1, 2015)
(To be submitted prior to Participant's Wastewater Loan Closing)

Participant Name		
CITY OF NORTH VERNON		
Street Address	P. O. Box Number	
143 E WALNUT ST		
City	State	Zip Code
NORTH VERNON	IN	47265

Section 602(B)(13) of the Federal Water Pollution Control Act (FWPCA) requires a recipient of a loan to certify that the recipient:

1) has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under the Clean Water State Revolving Fund Loan Program; and
2) has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account –
   (i) the cost of constructing the project or activity;
   (ii) the cost of operating and maintaining the project or activity over the life of the project or activity; and
   (iii) the cost of replacing the project or activity

Certification

We hereby certify pursuant to Section 602(B)(13) that the Participant has completed the requirements of Section 602(B)(13) as set forth in items (1) and (2) above.

Signature of the Authorized Representative

Printed Name: _____

Signature: _____

Date: _____

Signature of Consulting Engineer

Printed Name: RICHARD MORIN

Signature: Richard Morin

Date: JAN 9, 2017

Fiscal Sustainability Plan Self –Certification Form

(Pursuant to Section 603(d)(1)(E)(ii) of the Federal Water Pollution Control Act)
(To be submitted prior to Participant's Wastewater Loan Closing)

Participant Name		
CITY OF NORTH VERNON		
Street Address		P. O. Box Number
143 E WALNUT ST.		
City	State	Zip Code
NORTH VERNON	IN	47265

Section 603(d)(1)(E) of the Federal Water Pollution Control Act (FWPCA) requires a recipient of a loan for a project that involves the repair, replacement or expansion of a publically owned treatment works to develop and implement a Fiscal Sustainability Plan (FSP). The requirement pertains to those portions of the treatment works paid for with Clean Water SRF Loan Funds. The FSP must include the following minimum requirements as set forth in Section 603(d)(1)(E)(i): (I) an inventory of critical assets that are a part of the treatment works; (II) an evaluation of the condition and performance of inventoried assets or asset groupings; (III) a certification that the recipient has evaluated and will be implementing water and energy conservation efforts as part of the plan; and (IV) a plan for maintaining, repairing, and as necessary, replacing the treatment works and a plan for funding such activities; or per Section 603(d)(1)(E)(ii) certify that the recipient has developed and implemented a plan that meets the requirements above.

I certify that I am an authorized representative for the above listed Participant. I hereby certify pursuant to Section 603(d)(1)(E)(ii) that the Participant has developed an FSP that meets the above minimum requirements and the FSP is being implemented and will be updated as necessary. I further certify that the Participant has evaluated and will be implementing water and energy conservation efforts as part of the FSP. Upon the request of the Environmental Protection Agency (EPA) or the Indiana State Revolving Fund Loan Program (SRF), the Participant agrees to make the FSP available for inspection and/or review.

Signature of Authorized Representative	Date
Printed Name	Phone Number

TABLE VIII

SRF PROJECT FINANCING INFORMATION

(wastewater)

1. Project Cost Summary
   a. Collection/transport system cost _____
   b. Treatment System cost _____0_____
   c. Non-Point-Source (NPS) cost _____0_____
   Subtotal Construction Cost _____
   d. Capacity Reservation Fees _____0_____
   e. Contingencies _____
   (should not exceed 10% of construction cost)
   f. Non-construction Cost ____$870,000
   e.g., engineering/design services, field exploration studies, project management & construction inspection, legal & administrative services, land costs (including capitalized 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) **$3,888,300**
   h. Total ineligible SRF costs* (see next page) ____$110,000
   * 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.)__$110,000____
      (2) Cash on hand _____
      (3) Indiana Dept. of Commerce Community Focus Fund (CFF) _____
      (4) US Dept. of Agriculture Rural Development (RD) _____
      (5) Other _____
      Total Other Funding Sources **$110,000**

2. **SRF Loan Amount** (line g minus line item h) ____$3,778,300____

3. Financial Advisor
   a. Firm Contact ____London-Witte_____
   b. Name ____Sue Haase_____

4. Bond Counsel
   a. Firm Contact ___Bingham Greenebaum Doll
   b. Name ___Sue Beesley_____

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

1. Land cost (*unless it's for sludge application*) $ 110,000

   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 political subdivision.

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

   $_____