

SANDUSKY TOWNSHIP

The township is located in the central area of Sandusky County and the 2010 census stated that 3,619 people live in the unincorporated portions of the Township. The total land area is 22.4 square miles at an elevation of 614 feet. The City of Fremont is the only incorporated community in the Township. There are 162 people/square miles which does not include Fremont.

The City of Fremont is located in the southern portion of Sandusky Township. The City's 2010 Census listed the population at 16,734 and its total land area is at 8.35 square miles at an average elevation of 627 feet. There are 2,004 people per square mile. There are three (3) unincorporated communities located within the township, Four Mile House Center, Kingsway, and Muncie Hollow. Additional demographic and population projections for both Sandusky Township and the City of Fremont are as follows:

	2010 Census	Square Mile	Population/ Square Mile	MHI	LMI %
Sandusky Township	3,619	22.4	162	\$47,981	30.5
City of Fremont	16,734	8.35	2,004	\$39,398	49.3

	2010 Population	2010 Estimated Water Demand (100 gpcd)	2010 Estimated Water Demand/ Square Mile	2030 Population Estimate**	2030 Estimated Water Demand (100 gpcd)	2030 Estimated Water Demand/ Square Mile
Sandusky Township*	3,619	361,900 gpd	16,156 gpd	3,405	340,500 gpd	15,200 gpd
City of Fremont	16,734	1,673,400 gpd	200,407 gpd	15,747	1,574,700 gpd	188,587 gpd
* Water demand without Fremont						
** Ohio Department of Development - Sandusky County Projected Rate of Change - .059% to 2030						

Continuing their efforts with the City of Fremont and Ballville Township, the Sandusky Township Trustees identified a growth area along both sides of Hayes Avenue extending from the city limits westward. The two townships and the city are jointly extending water and sewer to serve both existing businesses eager to expand, and create an environment for new economic development.

The township also identified an array of other sites and areas in the township that are suitable for additional growth. One of the most visible and active in recent years is SR 53 at the township and municipal boundary. Much of this development has taken place in territory previously annexed from the township, but recent projects have approached the township side, and further growth is anticipated. The township and city have executed an annexation agreement to facilitate growth in a manner that is beneficial to both parties. With the annexed territory along SR 53 mostly built out, further growth and annexation farther to the north is a certainty.

Another area identified by County, Fremont, and township officials was the general area surrounding the US 80/90 Turnpike and SR 53 junction. This area continues to witness increased commercial and industrial growth, and a small boom in the hospitality industry. The availability of water and sewer, as well as proximity to major highways is well suited to this. The area west of Port Clinton Road, south of Hawk Road was also selected as an industrial growth area because of its rail access and prime location within the thoroughfare network.

City officials continue to embrace programs designed to revitalize and reuse existing properties within the city's boundaries. Currently, the City of Fremont has over 514,000 square feet of industrial and commercial space for lease or sale and approximately 36 acres for commercial and industrial development.

During the planning process, city officials designated several growth areas in the future land use map. Hayes Avenue from the City west to SR 53 was identified as a growth area by Ballville Township, Sandusky Township and the City of Fremont. Terra State Community College and the area east of campus area also expected to develop in the coming years. The City designated the east side of Stone Street as a growth area, which mirrors Sandusky Township's selection of the west side of that street. Sandusky Township might experience additional growth in the area surrounding the Fremont Energy Center due to the presence of water and sewer.

On Fremont's East Side, continued development is anticipated in the Bark Creek Industrial Park and the surrounding area. A developer has recently purchased a long-unused agricultural property that extends from this location south to SR 20.¹

Groundwater Resources - Sandusky Township is in a carbonate aquifer with yields ranging between 100 to 500 gpm. A small area to the east and also to the west of the City of Fremont have lower yields that would range between 50 to 100 gpm. There is an ODNR test well located northwest of Fremont that has a yield at 300 gpm. There are a number of industrial wells in the township that yield between 100 up to 200 gpm. Water quality and construction information on the test well is listed as follows:

	Test Well B
Depth (feet)	390
Bedrock (feet)	22
Yield (gpm)	300
Hardness (mg/l)	460
Iron (mg/l)	1.0
Calcium (mg/l)	109
Dissolved Solids (mg/l)	516
Sulfates (mg/l)	128

Surface Water Resources - Sandusky Township has four surface water drainage basins with the largest being the Sandusky River. The Sandusky River along with the other three basins all flow to the northeast. East of the Sandusky River, Bark Creek provide drainage for the small portion of the City of Fremont. The Muskellunge Creek flows northeast of Fremont and joins the Sandusky River. Muddy Creek is located in the northwest section of Sandusky Township.

Public Water Systems - The City of Fremont provides potable water to areas north of their corporation boundaries in Sandusky Township. Fremont's water treatment plant provides settling, softening, disinfection, and fluoridation. The plant is designed to produce 14.0 mgd and the current average daily demand is at 6.25 mgd. The City of Fremont's water plant would appear to have capacity for additional water needs in Sandusky Township. There are also three (3) private public water systems in the Township.

Wastewater Treatment Systems - The City of Fremont owns and operates an NPDES permitted wastewater Treatment Facility which is located at 1019 Sand Road. The treatment facility is designed for an average daily flow of 7.6 mgd, secondary treatment is provided and Sandusky River provides an outlet for the effluent discharge. The treatment process consists of screening, grit removal, primary settling, activated sludge, secondary settling, tertiary sand filtration followed by disinfection. There are also two (2) non-public wastewater treatment plants that currently discharge to receiving streams within the Township. Heinz North America located at 1200 North Fifth Street is Ohio EPA permitted to discharge to the Sandusky River and Precision Aggregates owns and operates a .202 mgd facility that discharges to the Muskellunge Creek.

Proposed Water Service⁵

Tractor Supply Company has recently experienced problems with their transient public water system. The Notice of Violations includes Failure to Sample for Total Coliforms, Not Providing an Operator of Record, and Appropriate Vent on the Well Cap.

The Sandusky and Rice Township Planning Area for water service is in the area north and northeast of the City of Fremont. The area includes the Port Clinton Road Corridor from Fremont to north of the Turnpike. The 1997 Comprehensive General Plan indicated that this area includes approximately 660 residential units with a number of commercial establishments. The current population in 1997 was estimated at 2000 and the commercial water demand was at 75,000 gpd. Also within this planning area is an existing water treatment plant that serves the Shorewood Village Subdivision.

A computer model of the proposed planning area water system was completed using a WaterCad computer program. This program allows data to be entered concerning pipe size, length, and condition; high service pumps, storage tanks, elevations, and projected flow data.

This model utilizes hydrant flow test data provided by the City. By running the computer model with this flow information, the computer program can then evaluate and determine appropriate waterline size in order to meet distribution system requirements.

It should be noted that in a complex system with several variables that it is not always possible to duplicate actual field results. The goal of this process is to create a model that will produce results that are reasonably close to actual field results. Although the results may not match exactly, this process works very well for evaluating proposed improvement. As such, the distribution modeling should be used only as a guide for selecting waterline sizes, locations, along with any additional storage improvements.

The computer model analyzed the available flow based on a residual pressure of 20 psi at selected fire hydrant locations. Required fire flows are determined by the type of building construction and total floor area in square feet. Table G-1 lists the amount of water required to be available for fire fighting purposes for two hour durations with domestic consumption at the 24 hour maximum rate. Available fire flows were then determined by the model and then compared to minimum fire flows as listed in Table G-1.

TABLE G-1 MINIMUM FIRE FLOWS		
Classification	Needed Fire Flow	Duration (hours)
One- and Two-Family Dwellings	500 - 1,000 gpm	2
Small Commercial	1,500 - 2,000 gpm	2
Medium Commercial and Industrial	2,000 - 3,000 gpm	3
Large Commercial and Industrial	3,500 gpm	3
Note: The above-listed fire flows are dependent on type of building construction material, total floor area of structure, and distances between structures.		

This planning area consists of portions of both townships. As previously discussed in the above Northern Ballville Service Area, this area was also included in the 1974 Regional Facility Master Plan and 1997 Sandusky County Comprehensive Water and Sanitary Sewer General Plan. It was again recommended that the City of Fremont be the supplier of potable water. The Fremont water treatment facility has available capacity to provide the design peak daily demand and the existing water distribution lines with the 2 mg elevated storage tank located north of the County fairgrounds would support the construction of a regional distribution system in this planning area. The water

distribution study completed in 1997 also evaluated the capability of the City of Fremont's water distribution to supply an adequate volume and pressure for both current and future water demands for this planning area. The suggested water distribution improvements from this study have been incorporated into this distribution model.

The Sandusky/Rice Township Service Area to be evaluated and modeled includes Port Clinton Road north to the Turnpike exchange and then west to Fangboner Road, also north of the Turnpike exchange to approximately Artz Road, east to the Sandusky River and west to Church Road.

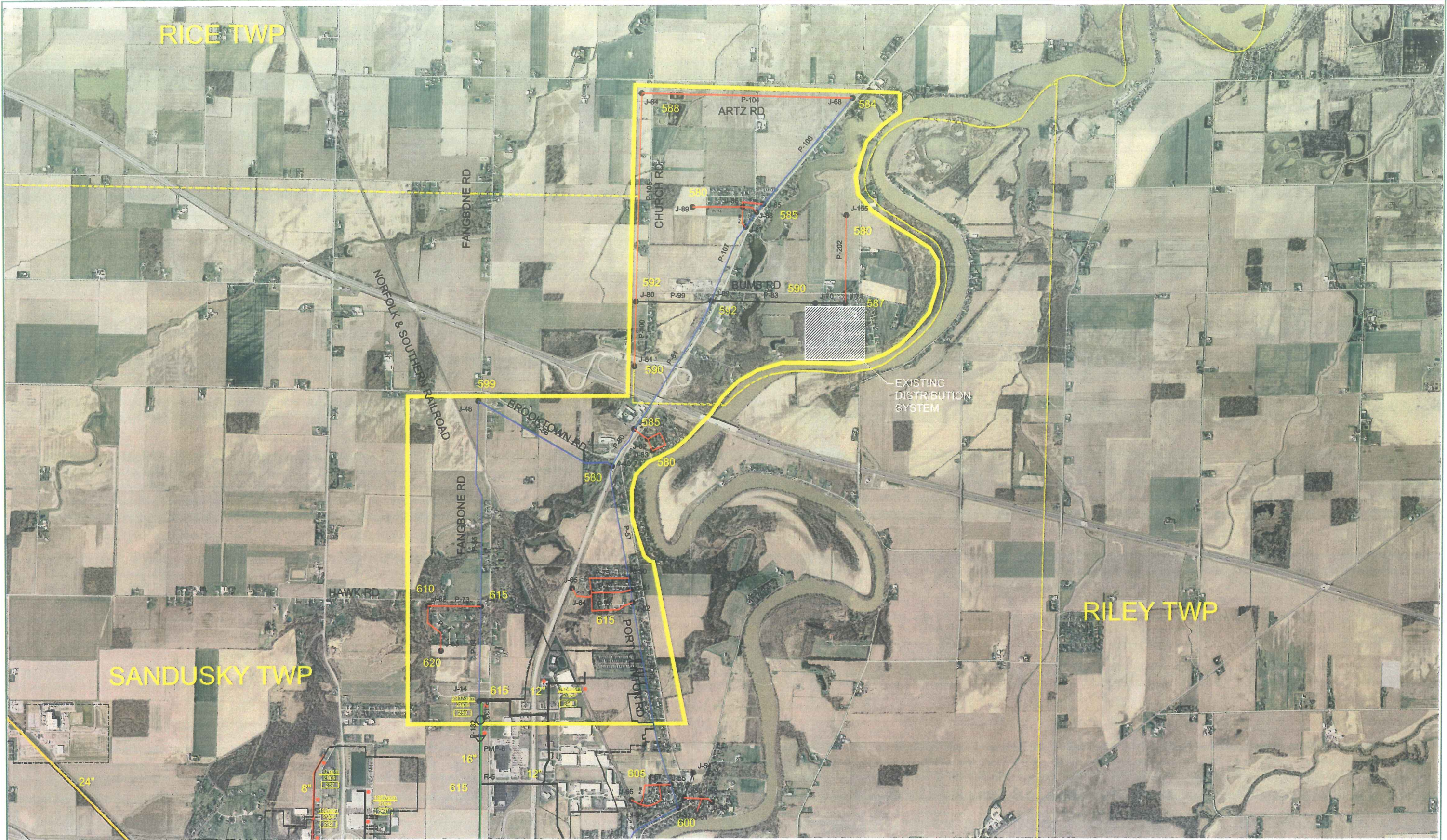
Plate G-1 from the Fremont Area Water District study illustrates the proposed water distribution improvements necessary to serve this planning area with potable water and minimum residential fire protection. The Sandusky/Rice Township Service Area proposed water distribution improvements included two (2) connection locations to the City of Fremont. Each of the two (2) connection locations was modeled to determine available fire flows and static pressure to the planning area. Estimated construction and project costs are identified in Table F-15. Criteria used for the development of the distribution model was based on the following:

- ▶ Available static pressure and fire flows from the City of Fremont.
- ▶ Projected daily peak demand of 508,000 gpd (353 gpm) also includes Shorewood Village Subdivision and projected commercial demand.

SANDUSKY AND RICE TOWNSHIPS PLANNING AREA PROJECTED AVERAGE AND PEAK DAILY FLOWS				
Current Population	Average Daily Flow (100 gpcd)	Average Daily Commercial Flow	Shorewood Village Subdivision	Peak Daily Flow (2.0)
1,075	107,500 gpd	75,000 gpd	25,000 gpd	415,000 gpd
Projected Population	Projected Average Daily Flow (100 gpcd)	Projected Average Daily Commercial Flow	Shorewood Village Subdivision	Projected Peak Daily Flow (2.0)
1,290	129,000 gpd	100,000 gpd	25,000 gpd	508,000 gpd

Current population based on actual house count and 2000 census data that suggested 2.56 people/household. Projected population based on 2013 Sandusky County Comprehensive Plan (20%).

- ▶ Minimum fire protection flow rate of 500 gpm at 20 psi.



LEGEND

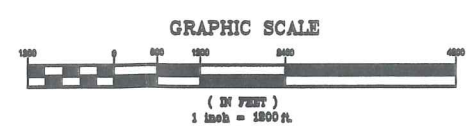
- PLANNING AREA
- 8" WATERLINE
- 10" WATERLINE
- 12" WATERLINE
- 16" WATERLINE
- 24" WATERLINE
- FIRE HYDRANT
- 255 FIRE HYDRANT ID NUMBER
- 1234gpm
20psi FIRE HYDRANT FLOW TEST RESULT
- CORPORATION LINE
- TOWNSHIP LINE

DISTRIBUTION MODEL LEGEND

- J-99 ● JUNCTION NODE

ESTIMATED PROPOSED WATERLINE QUANTITIES

8"	30,102'
10"	6,343'
12"	36,597'
16"	21,116'
24"	0'



REFERENCE:
ACAD DWG
R. HEYMAN
1/16/04

JOB #9166-090
FILE: ANALYSIS09A.DWG

**SANDUSKY AND RICE TOWNSHIP
PROPOSED DISTRIBUTION SYSTEM**

OHIO

PLATE G-1

**FREMONT AREA
WATER DISTRICT STUDY**

POGEMEYER DESIGN GROUP, INC.
ENGINEERS + ARCHITECTS + PLANNERS

Estimated construction costs for water service are listed as follows:

TABLE G-2 ESTIMATE OF COST WATERLINE IMPROVEMENTS SANDUSKY AND RICE TOWNSHIP SERVICE AREA					
Item No.	Description	Quantity	Unit	Unit Price	Total Cost
1	12" Diameter Waterline, Installed Complete	36,597	L.F.	\$48	\$1,756,656
2	12" Diameter Valve with Valve Box, Installed Complete	15	Each	\$2,600	\$39,000
3	Turnpike Jack Bore and Casing	220	L.F.	\$360	\$79,200
4	10" Diameter Waterline, Installed Complete	6,343	L.F.	\$44	\$279,092
5	10" Diameter Valve with Valve Box, Installed Complete	5	Each	\$2,175	\$10,875
6	8" Diameter Waterline, Installed Complete	30,102	L.F.	\$36	\$1,083,672
7	8" Diameter Valve and Valve Box, Installed Complete	20	Each	\$1,450	\$29,000
8	Fire Hydrant with Watch Valve, Installed Complete	45	Each	\$3,050	\$137,250
9	Waterline Connection into Existing Waterline Installed Complete with Tee, Valve, and Valve Box	2	Each	\$8,700	\$17,400
10	3/4" Service Line, Includes Meter and Pit (60% Participation)	252	Each	\$1,200	\$302,400
11	Restoration	1	L.S.	\$336,835	\$336,835
12	Miscellaneous, Includes Mobilization, Insurance, Bonding, and Administrative Costs	1	L.S.	\$14,500	\$14,500
	SUBTOTAL				\$4,085,880
	Contingencies (10%)				\$408,588
	TOTAL OPINION OF CONSTRUCTION COST				\$4,494,468
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$817,176
	TOTAL OPINION OF PROBABLE COSTS				\$5,311,644
Note: Fire hydrants located approximately every 500 feet in high density populated areas and every 1,000 feet in sparsely populated areas					

Critical Sewage Areas:

The Sandusky County Health Department, Ohio EPA, and TMACOG has identified Critical Sewage Areas which would include failed or failing onsite sewage systems. System failures could lead to surface and/or groundwater contamination or public health nuisances. These areas have been determined to be places where onsite sewage problems cannot be solved by conventional system upgrade or replacement. These areas became a priority for the Health Department and Ohio EPA to conduct sanitary surveys and general plans for providing public sanitary collection system and treatment alternatives.

There are six (6) Critical Sewage Areas located in Sandusky Township, East of Sandusky River (SA-08), Country Club Estates (SA-18), West State Street (SA-21), Christina Drive (SA-22), Four Mile House Road (SA-23), and West Hayes Avenue (SA-15).

Proposed Sanitary Sewer Service

The East of Sandusky River (SA-08) Critical Sewage Area is located north of Fremont and east of the Sandusky River. This area includes Muncie Hollow and Shannon Road areas adjacent to the river totaling 180 residents. Country Club Estates (SA-18) Critical Sewage Area is located east of Fremont at the corner of Sandusky Township. Both of these areas are in the Sandusky County General Sewer District and in the City of Fremont's 208 Planning Area.

The West State Street (SA-21) Critical Sewage Area is located west of the City of Fremont just south of the Route 20 Bypass. The SA-21 area is in the Sandusky County Sewer District No. 1 and in the City of Fremont's 208 Planning Area. The Four Mile House Road (SA-23) Critical Sewage Area is west of State Route 20 and the SA-21 area which is located east of State Route 20 would need to be constructed before the SA-23 area could be served with sewers.

Four Mile House Road (SA-23) Critical Sewage Area is also located west of Fremont and south of Route 20. The area is in the Sandusky County General Sewer District and in the City of Fremont's 208 Planning Area.

Christina Drive (SA-22) Critical Sewage Area is located in the City of Fremont with the closest sanitary sewer being in an annexed area by the City of Fremont. Since both of these are in the City of Fremont, this Critical Sewage Area will not be addressed in the County's General Plan.

Findings and orders were issued on December 10, 2007 to the Sandusky County Commissioners for the unsewered areas of Hayes Avenue (SA-15) and Timpe Road (SA-16). Timpe Road is in Ballville Township, but Hayes Avenue is on the Township line between Ballville Township and Sandusky Township. Residences in the Hayes Avenue Area have inadequate or failing onsite sewage disposal systems which discharge raw or partially treated sewage indirectly through storm sewers or field tiles. The County has the Hayes Avenue Sanitary Sewer Improvements - Phase 2 ready for construction in 2015 to address the Ohio EPA Findings and Orders. Hayes Avenue Sanitary Sewer Improvements - Phase 1 was completed in 2014. The area is in Sandusky County Sewer District No. 1 and in the City of Fremont's 208 Planning Area.

To address the East of Sandusky River (SA-08), there are a few items to consider since there is multiple Critical Sewage Areas (Wightman's Grove (SA-10) and Barkshire Hills (SA-19)) in Riley Township in close proximity. The East of Sandusky River Critical Sewage Area is divided by the Ohio Turnpike (Interstate 80/90). The southern part includes Muncie Hollow and the northern part includes Shannon Road.

Estimated construction costs for sanitary sewer service are listed as follows:

Option No. 1

City of Fremont South of Ohio Turnpike:

The area south of the Ohio Turnpike includes Barkshire Hills and the southern part of the East of Sandusky River (Muncie Hollow) area. This option would include the construction of conventional gravity sewers. The collected sewage would be delivered to the City of Fremont for treatment by means of a pump station located in the area of River Road and County Road 245. This pump station would pump to a second pump station that would be constructed in the area south of Barkshire Hills on County Road 198. This pump station would then deliver the sewage to the City

of Fremont for treatment via the General Sewer District's Fleming Lift Station on North Fifth Street. The sewer collection estimate of cost for this service area is as follows:

Muncie Hollow Gravity Sewers SA-08	\$ 966,115
Muncie Hollow Force Main	\$ 350,700
Barkshire Hills Gravity Sewers SA-19	\$ 622,304
Barkshire Hills Force Main	<u>\$ 273,300</u>
TOTAL OPINION OF CONSTRUCTION COST	\$2,212,419

Wightman's Grove Treatment North of Ohio Turnpike:

The area north of the Ohio Turnpike includes Memory Marina, Wightman's Grove, and the northern part of East of Sandusky River (Shannon Road) area. This option for sewer collection would include the construction of conventional gravity sewers in all these areas.

The collected sewage would be delivered to a wastewater treatment lagoon system that was sited south of Wightman's Grove as illustrated in the 2010 General Plan. A pump station would be constructed south of Wightman's Grove and would pump into a main pump station east of Memory Marina on County Road 259 then to the treatment process. Another pump station could then be constructed near Shannon Road and County Road 211 to deliver sewage to the wastewater treatment system. This treatment facility would be a Sandusky County Regional Treatment plant. The sewer collection and treatment estimate of cost for this service area is as follows:

Shannon Road Gravity Sewers SA-08	\$1,051,544
Shannon Road Force Main	\$ 451,500
Memory Marina Gravity Sewers SA-10	\$ 581,620
Memory Marina Force Main	\$ 181,500
Wightman's Grove Gravity Sewers SA-10	\$ 986,609
Wightman's Grove Force Main	\$ 181,500
Controlled Discharge Lagoon Treatment	<u>\$1,180,300</u>
TOTAL OPINION OF CONSTRUCTION COST	\$4,614,573

Option No. 1B

For the Shannon Road area within East of Sandusky River (SA-08) Critical Sewage Area, another option to consider would be to install a pump station on Shannon Road and pump the sewage across to the Shorewood Lift Station to be treated by the City of Fremont. The force main would cross the underneath the Sandusky River. The sewer collection estimate of cost for this service area is as follows:

Shannon Road Gravity Sewers SA-08	\$1,051,544
Shannon Road Force Main	<u>\$ 48,000</u>
TOTAL OPINION OF CONSTRUCTION COST	\$1,099,544

Option No. 2

Moving the wastewater treatment system to a centrally located area north of County Road 211 allows for gravity conventional systems to be constructed and the collected sewage pumped to this proposed location for treatment via force mains. The wastewater treatment system site will require additional investigation to verify availability of land, soil conditions, floodplain, wetlands, and outlet to the river. The Critical Sewage Areas to be considered are as follows:

- Muncie Hollow (SA-08)
- Barkshire Hills (SA-19)
- Shannon Road (SA-08)
- Memory Marina (SA-10)
- Wightman's Grove (SA-10)

The sewer collection and treatment estimate of cost for these areas is listed as follows:

Muncie Hollow Gravity Sewers SA-08	\$ 966,115
Muncie Hollow Force Main	\$ 350,700
Barkshire Hills Gravity Sewer SA-19	\$ 622,304
Barkshire Hills Force Main	\$ 287,700
Shannon Road Gravity Sewers SA-08	\$1,051,514

Shannon Road Force Main	\$ 98,700
Memory Marina Gravity Sewers SA-10	\$ 581,620
Memory Marina Force Main	\$ 451,500
Wightman's Grove Gravity Sewers SA-10	\$ 986,609
Wightman's Grove Force Main	\$ 181,500
Regional Treatment-Controlled Discharge Lagoon	<u>\$1,180,300</u>
TOTAL OPINION OF CONSTRUCTION COST	\$6,758,562

Option No. 3

Under Option No. 2, all Critical Areas are addressed with the proposed wastewater treatment system site. With the rising costs for wastewater treatment via the City of Fremont, costs to add the existing General Sewer District in Rice Township by changing the outlet of the Rice Lift Station force main to the Shannon Road system to transport the sewage to the proposed wastewater treatment system. This would include crossing underneath the Sandusky River.

The estimate for Option No. 3A to change the outlet connection to the Rice Lift Station force main is listed as follows:

Rice Lift Station Force Main	\$997,594
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Including the Sandusky Township Sewer District treatment from the proposed wastewater treatment system site would be done by changing the outlet of the Port Clinton Lift Station force main to the Muncie Hollow collection system to transport the sewage to the proposed wastewater treatment system. This would include crossing underneath the Sandusky River. Under this connection, Option No. 3A would not have to be completed and could be routed to the proposed wastewater treatment system.

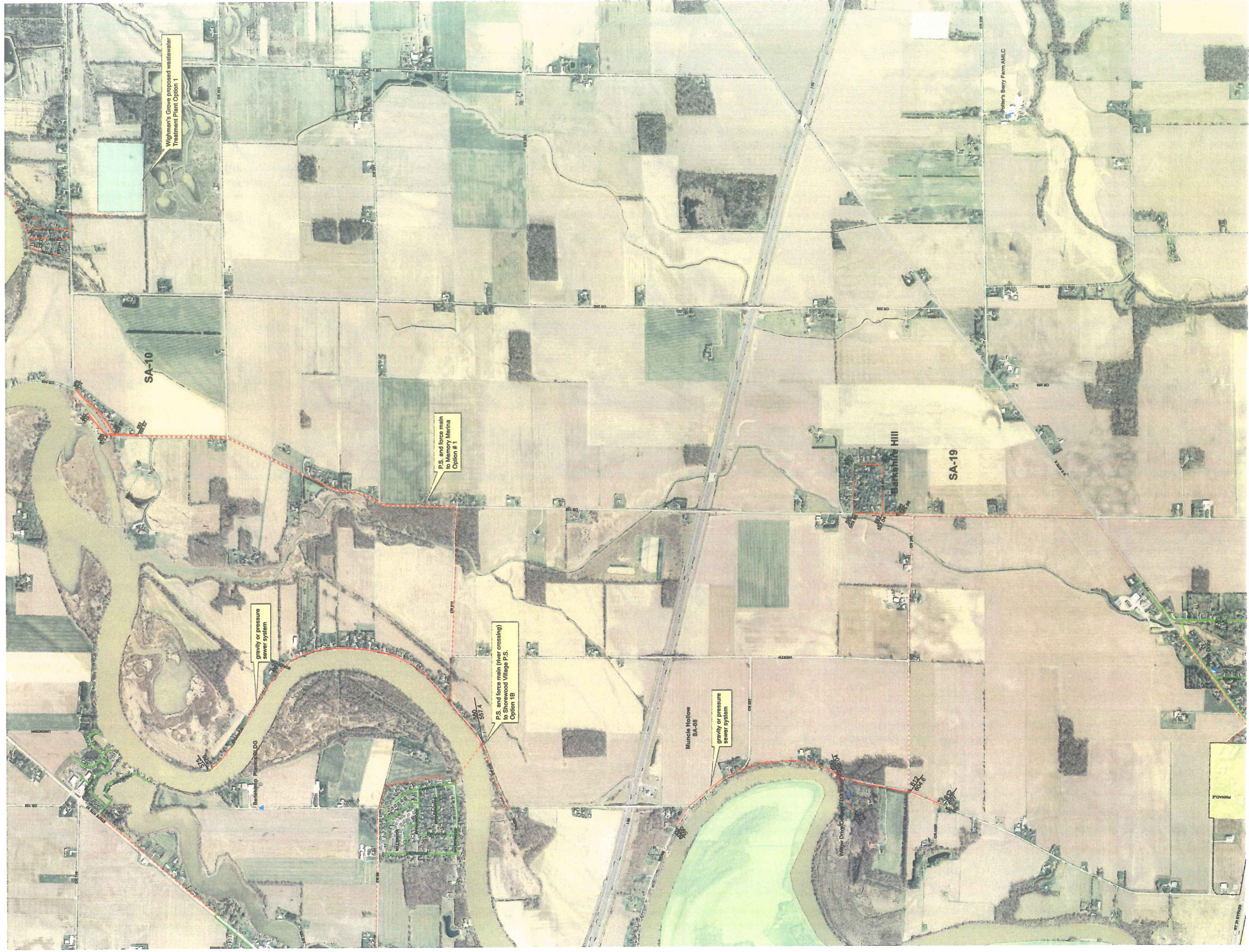
The estimate for Option No. 3B to change the outlet connection for the Port Clinton Lift Station force main is listed as follows:

Port Clinton Lift Station Force Main	\$1,142,804
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Option No. 3B would also allow for the possible reconnection of the Fleming Lift Station to the proposed wastewater treatment system at North River Road.

The estimate for Option No. 3C to change the outlet connection for the Fleming Lift Station force main is listed as follows:

Fleming Lift Station Force Main	\$328,380
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Option No. 1



- Proposed Manholes
- Proposed Pump Station
- Proposed Sanitary
- - - Proposed Forcemain
- District Gravity Sewers
- - - District Forcemain
- Proposed Treatment Site



D. HEYMAN
4/27/2014
PDC JOB# 3185-039
FILE: S:\13\80039
PLATE G-2

**CRITICAL AREA- SA-08/SA-10/SA-19
RILEY AND SANDUSKY TOWNSHIP
SANDUSKY COUNTY, OHIO
PLATE G-2**

**SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN**





0 0.175 0.35 0.7 Miles

Option No. 2

- Proposed Manholes
- Proposed Pump Station
- Proposed Sanitary
- - - Proposed Forcemain
- District Gravity Sewers
- - - District Forcemain
- Proposed Treatment Site



D. HEYMAN
4/27/2014
PDG JOB# 3185-038
FILE: S:\3185\038\PLATE16.MXD

CRITICAL AREA- SA-08/SA-10/SA-19
RILEY AND SANDUSKY TOWNSHIP
SANDUSKY COUNTY, OHIO
PLATE G-3

SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN





0 800 1,600 3,200 Feet

Sandusky Township and Sandusky County
Regional Treatment which Includes Critical Areas
SA-08/SA-10/SA-19

Option No. 3A, 3B, and 3C

- Proposed Manholes
- Proposed Pump Station
- Proposed Sanitary
- ... Proposed Forcemain
- District Gravity Sewers
- ... District Forcemain
- Proposed Treatment Site



D. HEYMAN
4/27/2014
POG JOB# 3185-039
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RILEY AND SANDUSKY TOWNSHIP
SANDUSKY COUNTY, OHIO
PLATE G-4

SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN



Estimated construction costs for sanitary sewer service are listed as follows:

TABLE G-3 MUNCIE HOLLOW CONVENTIONAL GRAVITY SEWERS RIVER ROAD AND WILLOW DRIVE SA-08					
Item No.	Description	Quantity	Unit	Unit Cost	Total Price
1	8" Gravity Sanitary Sewers	5,865	L.F.	\$65	\$381,225
2	6" Sanitary Laterals	29	Each	\$1,300	\$37,700
3	Manholes	17	Each	\$3,500	\$59,500
4	Asphalt Pavement Replacement	211	S.Y.	\$40	\$8,440
5	Driveway Replacement	150	S.Y.	\$45	\$6,750
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	950	L.F.	\$11	\$10,450
8	Stone Pavement	778	S.Y.	\$25	\$19,450
9	1 ½" Service Line	1	Each	\$450	\$450
10	Grinder Pump	1	Each	\$7,200	\$7,200
11	Pump Station	1	Each	\$150,000	\$150,000
12	Preconstruction Video	1	L.S.	\$2,500	\$2,500
13	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
14	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$743,165
	Contingencies (10%)				\$74,317
	TOTAL OPINION OF CONSTRUCTION COST				\$817,482
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$148,633
	TOTAL OPINION OF PROBABLE COSTS				\$966,115
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-4
 BARKSHIRE HILLS AREA - SA-19
 CONVENTIONAL GRAVITY SEWERS
 STATE ROUTE 198 AND COUNTY ROAD 631

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" Gravity Sanitary Sewers	2,710	L.F.	\$65	\$176,150
2	6" Sanitary Laterals	37	Each	\$1,300	\$48,100
3	Manholes	8	Each	\$3,500	\$28,000
4	Asphalt Pavement Replacement	19	S.Y.	\$40	\$760
5	Driveway Replacement	243	S.Y.	\$45	\$10,935
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	250	L.F.	\$11	\$2,750
8	Pump Station	1	Each	\$150,000	\$150,000
9	Preconstruction Video	1	L.S.	\$2,500	\$2,500
10	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
11	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$478,695
	Contingencies (10%)				\$47,870
	TOTAL OPINION OF CONSTRUCTION COST				\$526,565
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$95,739
	TOTAL OPINION OF PROBABLE COSTS				\$622,304
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-5
SHANNON ROAD AREA SA-08
CONVENTIONAL GRAVITY SEWERS

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" Gravity Sanitary Sewers	4,400	L.F.	\$65	\$286,000
2	6" Sanitary Laterals	47	Each	\$1,300	\$61,100
3	Manholes	11	Each	\$3,500	\$38,500
4	Asphalt Pavement Replacement	1,112	S.Y.	\$40	\$44,480
5	Driveway Replacement	440	S.Y.	\$45	\$19,800
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	1,200	L.F.	\$11	\$13,200
8	2" Low Pressure Sewer	1,600	L.F.	\$21	\$33,600
9	1 ½" Service Line	13	Each	\$450	\$5,850
10	Grinder Pump	13	Each	\$7,200	\$93,600
11	Flushing Connection	1	Each	\$750	\$750
12	Pump Station	1	Each	\$150,000	\$150,000
13	Preconstruction Video	1	L.S.	\$2,500	\$2,500
14	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
15	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$808,880
	Contingencies (10%)				\$80,888
	TOTAL OPINION OF CONSTRUCTION COST				\$889,768
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$161,776
	TOTAL OPINION OF PROBABLE COSTS				\$1,051,544
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-6
MEMORY MARINA AREA SA-10
CONVENTIONAL GRAVITY SEWERS

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" Gravity Sanitary Sewers	1,920	L.F.	\$65	\$124,800
2	6" Sanitary Laterals	29	Each	\$1,300	\$37,700
3	Manholes	6	Each	\$3,500	\$21,000
4	Stone Pavement Replacement	670	S.Y.	\$40	\$26,800
5	Driveway Replacement	140	S.Y.	\$45	\$6,300
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	250	L.F.	\$11	\$2,750
8	1 ½" Service Line	2	Each	\$450	\$900
9	Grinder Pump	2	Each	\$7,200	\$14,400
10	Flushing Connection	1	Each	\$750	\$750
11	Pump Station	1	Each	\$150,000	\$150,000
12	Preconstruction Video	1	L.S.	\$2,500	\$2,500
13	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
14	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$447,400
	Contingencies (10%)				\$44,740
	TOTAL OPINION OF CONSTRUCTION COST				\$492,140
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$89,480
	TOTAL OPINION OF PROBABLE COSTS				\$581,620
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-7
WIGHTMAN'S GROVE SA-10
ESTIMATE OF COST
CONVENTIONAL GRAVITY SEWER SYSTEM

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" PVC Sanitary Sewer	4,400	L.F.	\$65	\$286,000
2	6" Sanitary Laterals	75	Each	\$1,300	\$97,500
3	Manholes	18	Each	\$3,500	\$63,000
4	Asphalt Pavement Replacement	1,112	S.Y.	\$40	\$44,480
5	Driveway Replacement	440	S.Y.	\$45	\$19,800
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	1,200	L.F.	\$11	\$13,200
8	Residential Grinder Pumps	3	Each	\$7,200	\$21,600
9	1 ½" Service Lines	3	Each	\$450	\$1,350
10	Pump Station	1	Each	\$150,000	\$150,000
11	Preconstruction Video	1	L.S.	\$2,500	\$2,500
12	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
13	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$758,930
	Contingencies (10%)				\$75,893
	TOTAL OPINION OF CONSTRUCTION COST				\$834,823
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$151,786
	TOTAL OPINION OF PROBABLE COSTS				\$986,609
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-8
OPTION 3A
RICE LIFT STATION AND FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	10" Force Main Includes River Crossing	7,100	L.F.	\$75	\$532,500
2	Grinder Pump	3	Each	\$7,200	\$21,600
3	1 ½" Service Line	3	Each	\$450	\$1,350
4	8" Gravity Sanitary Sewer	2,200	L.F.	\$65	\$143,000
5	6" Sanitary Laterals	21	Each	\$1,300	\$27,300
6	Manholes	6	Each	\$3,500	\$21,000
7	Asphalt Pavement Replacement	311	S.Y.	\$40	\$12,440
8	Driveway Replacement	182	S.Y.	\$45	\$8,190
9	Pump Station	1	Each	\$150,000	\$150,000
10	Seeding, Mulching, Restoration	1	L.S.	\$25,000	\$25,000
11	Preconstruction Video	1	L.S.	\$2,500	\$2,500
12	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
13	Mobilization and Bonds	1	L.S.	\$2,700	\$2,700
	SUBTOTAL				\$767,380
	Contingencies (10%)				\$76,738
	TOTAL OPINION OF CONSTRUCTION COST				\$844,118
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$153,476
	TOTAL OPINION OF PROBABLE COSTS				\$997,594
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-9
OPTION 3B
PORT CLINTON LIFT STATION AND FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	12" Force Main Includes River Crossing	9,300	L.F.	\$75	\$697,500
2	Grinder Pump	12	Each	\$7,200	\$86,400
3	1 ½" Service Line	12	Each	\$450	\$5,400
4	Flushing Connection	1	Each	\$750	\$750
5	Drive Replacement	194	S.Y.	\$45	\$8,730
6	Asphalt Pavement Replacement	70	S.Y.	\$40	\$2,800
7	Pump Station Modification	1	Each	\$50,000	\$50,000
8	Seeding, Mulching, Restoration	1	L.S.	\$25,000	\$25,000
9	Preconstruction Video	1	L.S.	\$2,500	\$2,500
10	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
11	Mobilization and Bonds	1	L.S.	\$2,700	\$2,700
	SUBTOTAL				\$879,080
	Contingencies (10%)				\$87,908
	TOTAL OPINION OF CONSTRUCTION COST				\$966,988
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$175,816
	TOTAL OPINION OF PROBABLE COSTS				\$1,142,804
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-10
OPTION 3C
FLEMING LIFT STATION FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	4" Force Main	3,100	L.F.	\$40	\$124,000
2	Grinder Pump	6	Each	\$7,200	\$43,200
3	1 ½" Service Line	6	Each	\$450	\$2,700
4	12" Bore and Jack Casing Pipe (US Route 6)	60	L.F.	\$250	\$15,000
5	Pump Station Modification	1	Each	\$30,000	\$30,000
6	Seeding, Mulching, Restoration	1	L.S.	\$25,000	\$25,000
7	Preconstruction Video	1	L.S.	\$2,500	\$2,500
8	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
9	Mobilization and Bonds	1	L.S.	\$2,700	\$2,700
	SUBTOTAL				\$252,600
	Contingencies (10%)				\$25,260
	TOTAL OPINION OF CONSTRUCTION COST				\$277,860
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$50,520
	TOTAL OPINION OF PROBABLE COSTS				\$328,380
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-11
FORCE MAIN OPINION OF ESTIMATED COST

Option No. 1			
Memory Marina SA-10	3,025	L.F.	\$181,500
Shannon Road SA-08	7,525	L.F.	\$451,500
Muncie Hollow SA-08	5,845	L.F.	\$350,700
Barkshire Hills SA-19	4,555	L.F.	\$273,300
Option No. 1B			
Shannon Road SA-08	800	L.F.	\$48,000
Option No. 2			
Wightman's Grove SA-10	3,025	L.F.	\$181,500
Memory Marina SA-10	7,525	L.F.	\$451,500
Shannon Road 234 SA-08	1,645	L.F.	\$98,700
Barkshire Hills SA-19	4,795	L.F.	\$287,700
Muncie Hollow SA-08	4,200	L.F.	\$252,000
Option No. No. 3			
Rice Lift Station/Force Main 3A	Table G-8		\$844,118
Port Clinton Lift Station/Force Main 3B	Table G-9		\$966,988
Fleming Lift Station/Force Main 3C	Table G-10		\$277,860
<p>Note: Above listed force mains are 6" diameter and estimated at \$60/l.f. Cost includes restoration and project costs. See detailed estimate in the Appendix.</p>			

TABLE G-12
PROJECTED SANITARY SEWER FLOWS
OPTION 1
SERVICE AREA ESTIMATED SANITARY FLOW TO FREMONT

- ▶ 2010 Census - 2.31 persons per household
- ▶ 100 gallon/day/capita residential
- ▶ Commercial and allowable I/I = 10%
- ▶ Adjusted gallons/day/capita - 110 gpcd
- ▶ 20 year projected growth = -.059

Muncie Hollow

- ▶ 30 service connections x 2.31 pph x 110 gpcd = 7,623 gpd

Barkshire Hills

- ▶ 37 service connections x 2.31 pph x 110 gpcd = 9,402 gpd

Total estimated sanitary flows = 17,025 gpd

Fremont Treatment Costs = \$62.41/month (current)
\$80.00/month (projected by city)

TABLE G-13
PROJECTED SANITARY SEWER FLOWS
OPTION 1
SERVICE AREA ESTIMATED SANITARY FLOW TO WIGHTMAN'S GROVE

- ▶ 2010 Census - 2.31 persons per household
- ▶ 100 gallon/day/capita residential
- ▶ Commercial and allowable I/I = 10%
- ▶ Adjusted gallons/day/capita - 110 gpcd
- ▶ 20 year projected growth = -.059

Shannon Road

- ▶ 60 service connections x 2.31 pph x 110 gpcd = 15,246 gpd

Memory Lane

- ▶ 31 service connections x 2.31 pph x 110 gpcd = 7,877 gpd

Wightman's Grove

- ▶ 75 service connections x 2.31 pph x 110 gpcd = 19,058 gpd

Total estimated sanitary flows = 42,181 gpd

Treatment Estimated O&M Costs = \$37,700/year

Total estimated service connections = 166

Sandusky County Treatment Costs = \$18.93/month

TABLE G-14
 SHANNON ROAD, MEMORY LANE AND WIGHTMANS GROVE
 EXTENDED AERATION
 WITH TERTIARY SLOW SAND FILTERS
 DESIGN FLOW - 45,000 GPD

Item No.	Item	Estimated Cost
1	Pretreatment Facilities (Trash Trap/Aerated Flow EQ) Extended Aeration Plant (Package) Alum Feed Dosing Tank with Submersible Pumps/Controls Distribution Box Fixed Media Clarifiers and Slow Sand Filters Chlorination/Dechlorination Tank/Post Aeration Flow Meter and Recorder Aerated Sludge Holding Tank	\$295,000.00
2	Outfall Sewer to Receiving Stream with Manhole	94,000.00
3	Control and Storage Building	85,000.00
4	Standby Power	40,000.00
5	Non-Component Costs (Includes piping and electrical)	75,000.00
6	Site Work (including Grading, Seeding, Walks, Etc.)	85,000.00
7	Drives and Fences	50,000.00
	SUBTOTAL	\$724,000.00
	10% Contingencies	72,400.00
	Land Purchase (1 acre)	10,000.00
	TOTAL OPINION OF CONSTRUCTION COSTS	\$806,400.00
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees	\$144,800.00
	TOTAL OPINION OF PROBABLE COSTS	\$951,200.00
	Note: Pump station and force main to WWTP is included in the collection system opinion of construction costs.	

TABLE G-15
 SHANNON ROAD, MEMORY LANE AND WIGHTMANS GROVE
 45,000 GPD
 ESTIMATED COST OF OPERATION AND MAINTENANCE -
 EXTENDED AERATION PLANT WITH TERTIARY TREATMENT

Item	Estimated Annual Cost
Labor *	\$14,600.00
Administration and Billings	\$5,200.00
Utilities	\$8,700.00
Chemicals	\$600.00
Replacement	\$1,700.00
Contract Sludge Hauling	\$3,000.00
Contract Lab	\$2,800.00
Insurance and Miscellaneous Fees	\$1,100.00
TOTAL	\$37,700.00

* The treatment works at .030 mgd will require a Class 1 Operator of Record at a minimum. The minimum staffing requirement is 3 days/week for a minimum of 1.5 hour per week. The labor estimate is based on 8 hours/week. The above estimate is only intended to be used as a comparison to different treatment technologies and processes. Actual annual costs will be based on Sandusky County's operations and maintenance.

TABLE G-16
PROJECTED SANITARY SEWER FLOWS
OPTION 1B
SERVICE AREA ESTIMATED SANITARY FLOW TO FREMONT

- ▶ 2010 Census - 2.31 persons per household
- ▶ 100 gallon/day/capita residential
- ▶ Commercial and allowable I/I = 10%
- ▶ Adjusted gallons/day/capita - 110 gpcd
- ▶ 20 year projected growth = -.059

Shannon Road

- ▶ 60 service connections x 2.31 pph x 110 gpcd = 15,246 gpd

Total estimated sanitary flows = 15,246 gpd

Fremont Treatment Costs = \$52.32/month (current)
\$80.00/month (projected by city)

TABLE G-17
PROJECTED SANITARY SEWER FLOWS
OPTION 2
SERVICE AREA ESTIMATED SANITARY FLOW

- ▶ 2010 Census - 2.31 persons per household
- ▶ 100 gallon/day/capita residential
- ▶ Commercial and allowable I/I = 10%
- ▶ Adjusted gallons/day/capita - 110 gpcd
- ▶ 20 year projected growth = -.059

Muncie Hollow

- ▶ 30 service connections x 2.31 pph x 110 gpcd = 7,623 gpd

Barkshire Hills

- ▶ 37 service connections x 2.31 pph x 110 gpcd = 9,402 gpd

Shannon Road

- ▶ 60 service connections x 2.31 pph x 110 gpcd = 15,246 gpd

Memory Lane

- ▶ 31 service connections x 2.31 pph x 110 gpcd = 7,877 gpd

Wightman's Grove

- ▶ 75 service connections x 2.31 pph x 110 gpcd = 19,058 gpd

Total estimated sanitary flows = 59,206 gpd

Treatment Estimated O&M Cost = \$41,000/year

Total Estimated Service Connections = 233

Sandusky County Treatment Costs = \$14.66/month

TABLE G-18
 OPTION 2
 EXTENDED AERATION
 WITH TERTIARY SLOW SAND FILTERS
 DESIGN FLOW - 60,000 GPD

Item No.	Item	Estimated Cost
1	Pretreatment Facilities (Trash Trap/Aerated Flow EQ) Extended Aeration Plant (Package) Alum Feed Dosing Tank with Submersible Pumps/Controls Distribution Box Fixed Media Clarifiers and Slow Sand Filters Chlorination/Dechlorination Tank/Post Aeration Flow Meter and Recorder Aerated Sludge Holding Tank	\$450,000.00
2	Outfall Sewer to Receiving Stream with Manhole	94,000.00
3	Control and Storage Building	85,000.00
4	Standby Power	50,000.00
5	Non-Component Costs (Includes piping and electrical)	80,000.00
6	Site Work (including Grading, Seeding, Walks, Etc.)	85,000.00
7	Drives and Fences	50,000.00
	SUBTOTAL	\$894,000.00
	10% Contingencies	89,400.00
	Land Purchase (1 acre)	10,000.00
	TOTAL OPINION OF CONSTRUCTION COSTS	\$993,400.00
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees	\$178,800.00
	TOTAL OPINION OF PROBABLE COSTS	\$1,172,200.00
	Note: Pump station and force main to WWTP is included in the collection system opinion of construction costs.	

TABLE G-19
 OPTION 2
 60,000 GPD
 ESTIMATED COST OF OPERATION AND MAINTENANCE -
 EXTENDED AERATION PLANT WITH TERTIARY TREATMENT

Item	Estimated Annual Cost
Labor *	\$14,600.00
Administration and Billings	\$5,200.00
Utilities	\$10,700.00
Chemicals	\$800.00
Replacement	\$2,000.00
Contract Sludge Hauling	\$3,800.00
Contract Lab	\$2,800.00
Insurance and Miscellaneous Fees	\$1,100.00
TOTAL	\$41,000.00

* The treatment works at .030 mgd will require a Class 1 Operator of Record at a minimum. The minimum staffing requirement is 3 days/week for a minimum of 1.5 hour per week. The labor estimate is based on 8 Hours/week. The above estimate is only intended to be used as a comparison to different treatment technologies and processes. Actual annual costs will be based on Sandusky County's operations and maintenance.

TABLE G-20
PROJECTED SANITARY SEWER FLOWS
OPTION 3
SERVICE AREA ESTIMATED SANITARY FLOW

- ▶ 2010 Census - 2.31 persons per household
- ▶ 100 gallon/day/capita residential
- ▶ Commercial and allowable I/I = 10%
- ▶ Adjusted gallons/day/capita - 110 gpcd
- ▶ 20 year projected growth = -.059

Muncie Hollow

- ▶ 30 service connections x 2.31 pph x 110 gpcd = 7,623 gpd

Barkshire Hills

- ▶ 37 service connections x 2.31 pph x 110 gpcd = 9,402 gpd

County Road 234

- ▶ 60 service connections x 2.31 pph x 110 gpcd = 15,246 gpd

Memory Lane

- ▶ 31 service connections x 2.31 pph x 110 gpcd = 7,877 gpd

Wightman's Grove

- ▶ 75 service connections x 2.31 pph x 110 gpcd = 19,058 gpd

Sandusky County General Sewer District

- ▶ 267 service connections x 2.31 pph x 110 gpcd = 67,845 gpd

Sandusky Township Sewer District

- ▶ 419 service connections x 2.31 pph x 110 gpcd = 106,468 gpd

Total estimated sanitary flows = 233,519 gpd

Treatment Estimated O&M Cost = \$165,300/year

Total estimated service connections = 919

Sandusky County Treatment Cost = \$14.99/month

TABLE G-21
TREATMENT PLANT ALTERNATIVE NO. 1
OXIDATION DITCH WITH FINAL SETTLING .250 MGD

Description: Alternative No. 1 will include a mechanical screen, raw sewage pumps, oxidation ditch, final settling tanks, RAS/WAS pump station, UV disinfection, post aeration, aerobic sludge digestion, and sludge dewatering.

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Raw Water Pump and Mechanical Screen Building Complete with Flow Meter, Recorders, VFD Controls, and Sampler	1	L.S.	\$700,000	\$700,000
2	Oxidation Ditch - 2 Channel Looped Reactor System with Controls	1	L.S.	\$725,000	\$725,000
3	Two Final Settling Tanks	1	L.S.	\$475,000	\$475,000
4	RAW/WAS Pump Station Complete with Wet Well, Flow Metering, and Building	1	L.S.	\$260,000	\$260,000
5	UV Disinfection Complete with Post Aeration, Flow Meter, and Sample	1	L.S.	\$200,000	\$200,000
6	Chemical Feed and Storage For Phosphorous Removal	1	L.S.	\$100,000	\$100,000
7	Aerobic Sludge Digestion 2 Tanks for 180 day Storage and Treatment, Includes Building, Blowers, Mixers, Diffusers, and Piping	1	L.S.	\$375,000	\$375,000
8	Sludge Dewatering Includes Building, Polymer Feed System, and Storage	1	L.S.	\$500,000	\$500,000
9	Laboratory Building to Include Office and Restrooms	1	L.S.	\$240,000	\$240,000
10	Auxiliary Power Complete with Fuel Storage, Controls, and Outside Housing	1	L.S.	\$100,000	\$100,000
11	Non-Potable Water System	1	L.S.	\$65,000	\$65,000
12	Piping, Electrical, Site Work, Driveway, Fence, and Outfall to River	1	L.S.	\$650,000	\$650,000
	SUBTOTAL				\$4,390,000
	Contingencies (10%)				\$439,000
	Land Purchase				\$30,000
	TOTAL OPINION OF CONSTRUCTION COST				\$4,859,000
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$878,000
	TOTAL OPINION OF PROBABLE COSTS				\$5,737,000

TABLE G-22
TREATMENT PLANT ALTERNATIVE NO. 2
SEQUENCING BATCH REACTOR (SBR) .250 MGD

Description: Alternative No. 2 will include a mechanical screen, raw sewage pumps, Sequencing Batch Reactor (SBR), UV disinfection, post aeration, aerobic sludge digestion, and sludge dewatering.

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Raw Water Pump and Mechanical Screen Building Complete with Flow Meter, Recorders, VFD Controls, and Sampler	1	L.S.	\$700,000	\$700,000
2	Sequencing Batch Reactor (SBR) Includes Blowers, Diffusers, Decant, Equipment, Valves, Controls, Tanks, and Blower Building	1	L.S.	\$1,300,000	\$1,300,000
3	UV Disinfection Complete with Post Aeration, Flow Meter, and Sampler	1	L.S.	\$250,000	\$250,000
4	Chemical Feed and Storage For Phosphorous Removal	1	L.S.	\$100,000	\$100,000
5	Aerobic Sludge Digestion 2 Tanks for 180 day Storage and Treatment, Includes Building, Blowers, Mixers, Diffusers, and Piping	1	L.S.	\$375,000	\$375,000
6	Sludge Dewatering Includes Building, Polymer Feed System, and Storage	1	L.S.	\$500,000	\$500,000
7	Laboratory Building to Include Office and Restrooms	1	L.S.	\$240,000	\$240,000
8	Auxiliary Power Complete with Fuel Storage, Controls, and Outside Housing	1	L.S.	\$100,000	\$100,000
9	Non-Potable Water System	1	L.S.	\$65,000	\$65,000
10	Piping, Electrical, Site Work, Driveway, Fence, and Outfall to River	1	L.S.	\$650,000	\$650,000
	SUBTOTAL				\$4,280,000
	Contingencies (10%)				\$428,000
	Land Purchase				\$30,000
	TOTAL OPINION OF CONSTRUCTION COST				\$4,738,000
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$856,000
	TOTAL OPINION OF PROBABLE COSTS				\$5,594,000

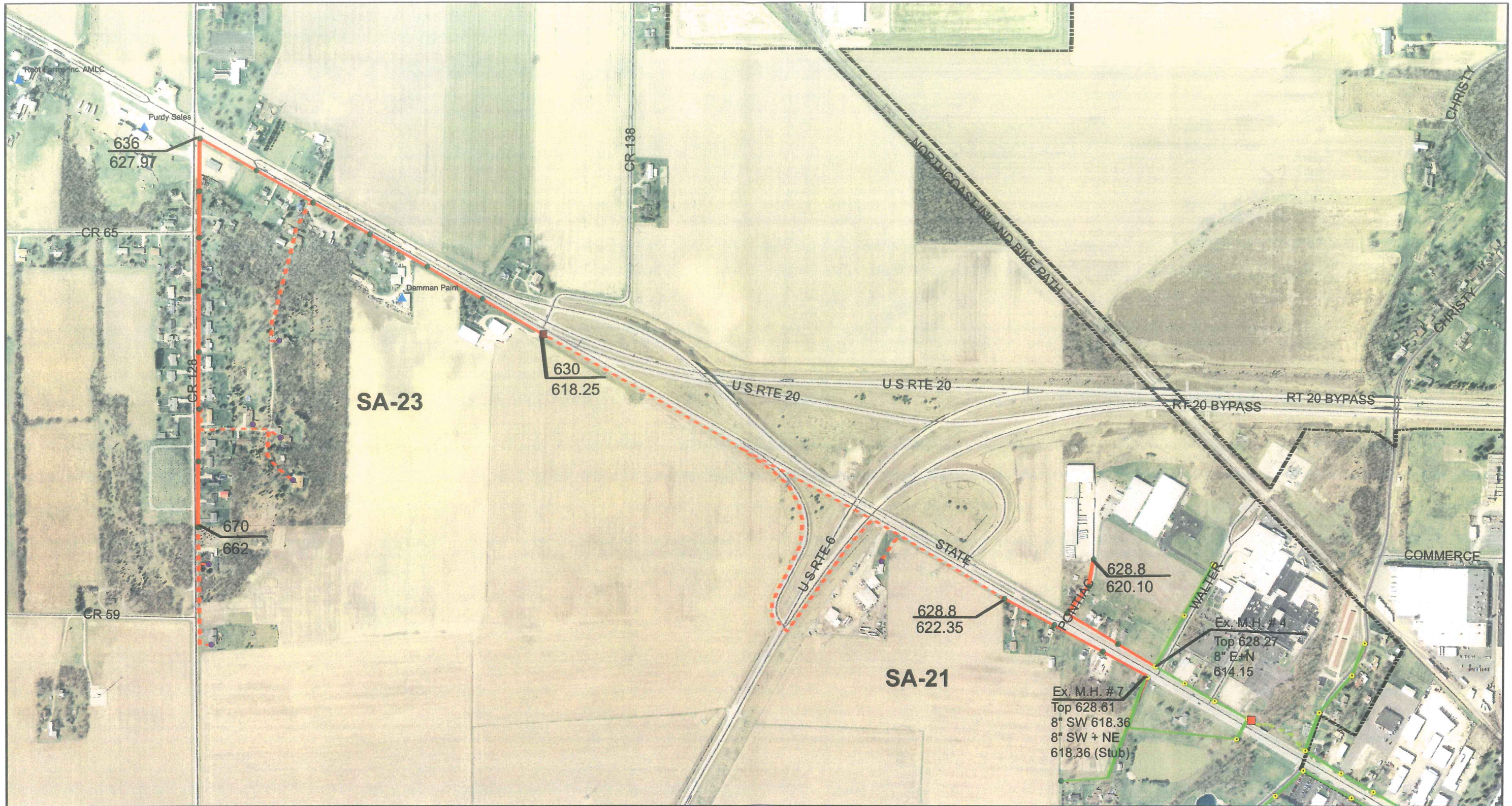
TABLE G-23
ESTIMATED ANNUAL REGIONAL TREATMENT COSTS

Description	Estimated Costs
Personnel Services *	\$80,000
Ohio Public Employees Retirement System	\$11,200
Medicare	\$1,200
Medical/Hospitalization	\$6,900
Worker's Compensation	\$3,000
Uniforms and Clothing	\$2,000
Telephone	\$2,400
Training Services	\$1,200
Professional and Technical Services - Labs	\$5,600
Insurance and Bonding	\$3,000
Utility - Wastewater Treatment	\$30,000
Operating Supplies and Materials	\$2,600
Operating Supplies and Materials - Chemicals	\$4,700
Repairs and Maintenance of Building and Land	\$1,000
Sludge Disposal	\$5,500
Capital Improvement Fund	\$5,000
ESTIMATED OPERATING COSTS	\$165,300

* Based on one full-time Ohio EPA certified operator and one part-time staff member
 Note: The above estimate only includes treatment plant operations and does not include administration or billing which is already provided by the Sandusky County Sanitary Engineer's office.

Estimated monthly operation and maintenance cost:

- ▶ Estimated operating and maintenance - \$165,300
- ▶ 919 service connections = \$14.99/month



- Existing Pump Station
- Proposed Pump Station
- Proposed Grinder Pump
- Proposed Manhole
- Existing Manhole
- Existing Sewers
- Proposed Sanitary
- - Proposed Forcemain



R. HEYMAN
4/27/2014
PDG JOB# 3185-039
FILE: S:\3185-039\SEWERS\PLATE23.MXD

CRITICAL AREA- SA-21 and SA-23
SANDUSKY TOWNSHIP
SANDUSKY COUNTY, OHIO
PLATE G-5

SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN



TABLE G-24
WEST STATE STREET AREA - SA-21
CONVENTIONAL GRAVITY, LOW PRESSURE, PUMP STATION, AND FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" Gravity Sanitary Sewers	1,990	L.F.	\$65	\$129,350
2	6" Sanitary Laterals	11	Each	\$1,300	\$14,300
3	Manholes	7	Each	\$3,500	\$24,500
4	Asphalt Pavement Replacement	40	S.Y.	\$40	\$1,600
5	Driveway Replacement	175	S.Y.	\$45	\$7,875
6	Storm Sewer Replacement	300	L.F.	\$11	\$3,300
7	Connection to Existing Manholes	2	Each	\$2,000	\$4,000
8	Seeding, Mulching, & Rest.	1	L.S.	\$10,000	\$10,000
9	Preconstruction Video	1	L.S.	\$2,000	\$2,000
10	Traffic Maintenance	1	L.S.	\$3,500	\$3,500
11	Mobilization and Bonds	1	L.S.	\$13,500	\$13,500
	SUBTOTAL				\$213,925
	Contingencies (10%)				\$21,393
	TOTAL OPINION OF CONSTRUCTION COST				\$235,318
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$42,785
	TOTAL OPINION OF PROBABLE COSTS				\$278,103
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				

TABLE G-25
FOUR MILE HOUSE ROAD AREA - SA-23
CONVENTIONAL GRAVITY, LOW PRESSURE, PUMP STATION, AND FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	8" Gravity Sanitary Sewers	6,770	L.F.	\$65	\$440,050
2	6" Sanitary Laterals	51	Each	\$1,300	\$66,300
3	Manholes	20	Each	\$3,500	\$70,000
4	Asphalt Pavement Replacement	140	S.Y.	\$40	\$5,600
5	Driveway Replacement	745	S.Y.	\$45	\$33,525
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	750	L.F.	\$11	\$2,750
8	1 ½" Service Line	1,795	L.F.	\$12	\$21,540
9	2" Force Main	1,265	L.F.	\$13	\$16,445
10	Grinder Pump	8	Each	\$7,200	\$57,600
11	Flushing Connection	3	Each	\$750	\$2,250
12	12" Steel Casing Pipe	80	L.F.	\$250	\$20,000
13	Pump Station	1	Each	\$217,500	\$217,500
14	Fencing 8' High	1	L.S.	\$3,625	\$3,625
15	Grading/Site Work/Drive	1	L.S.	\$3,625	\$3,625
16	4,480' of 4" Force Main (at \$30/LF)	1	L.S.	\$134,400	\$134,400
17	Preconstruction Video	1	L.S.	\$2,500	\$2,500
18	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
19	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$1,157,210
	Contingencies (10%)				\$115,721
	TOTAL OPINION OF CONSTRUCTION COST				\$1,272,931
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$231,442
	TOTAL OPINION OF PROBABLE COSTS				\$1,504,373
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				



- SA-18 Proposed Grinder Pump
- SA-18 Proposed Manhole
- SA-18 Proposed Forcemain
- SA-18 Proposed Sanitary
- Existing Gravity Sewers
- Existing Forcemain



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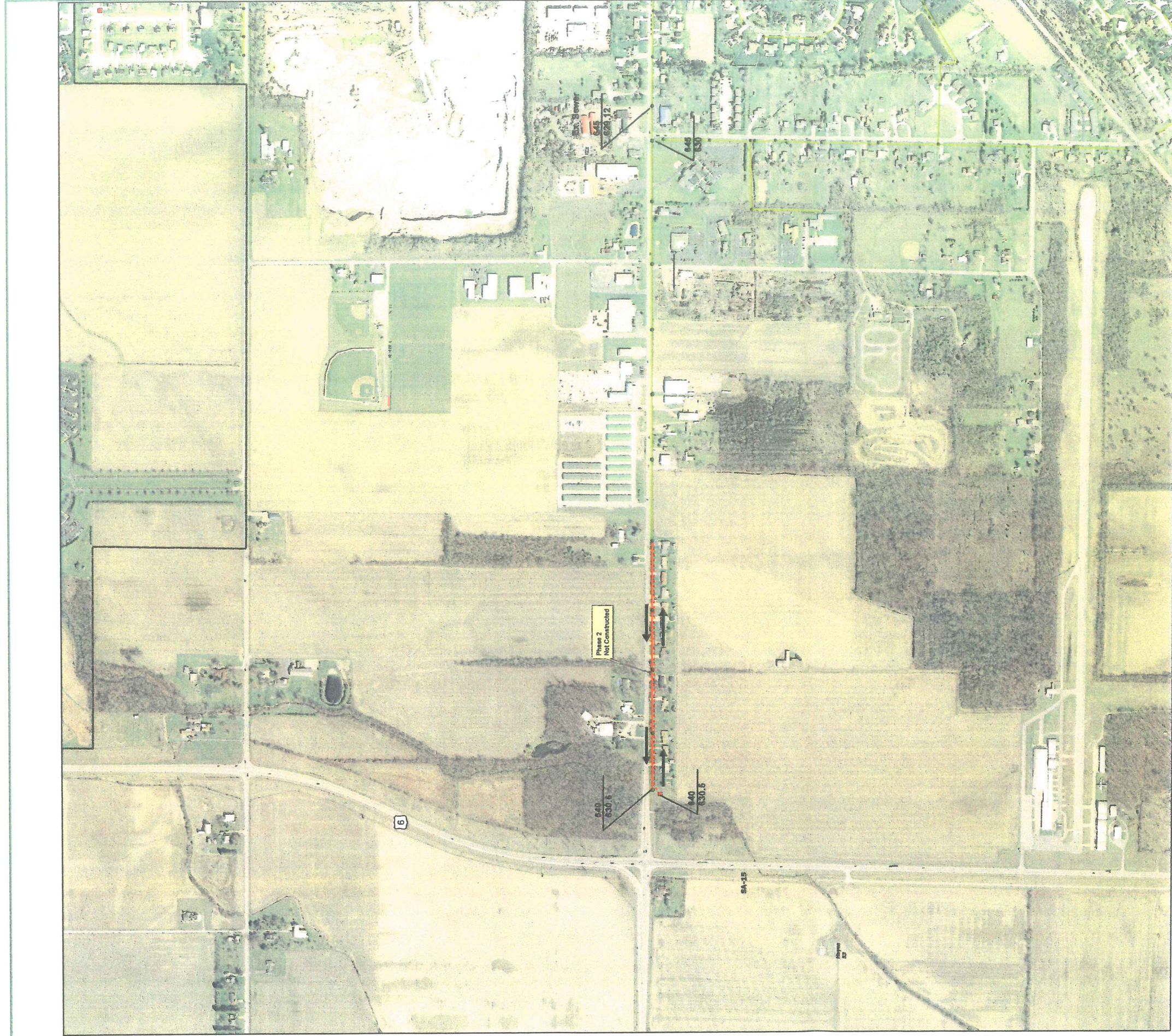
CRITICAL AREAS- SA-16 & SA-18
BALLVILLE, GREEN CREEK & SANDUSKY TOWNSHIPS
SANDUSKY COUNTY, OHIO
PLATE G-6

**SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN**



TABLE G-26
 COUNTRY CLUB ESTATES (COUNTY ROAD 198) AREA - SA-18
 CONVENTIONAL GRAVITY, LOW PRESSURE, PUMP STATION, AND FORCE MAIN

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	10" Gravity Sanitary Sewers	2,382	L.F.	\$75	\$178,650
2	6" Sanitary Laterals	1	Each	\$1,300	\$1,300
3	Manholes	7	Each	\$3,500	\$24,500
4	Asphalt Pavement Replacement	19	S.Y.	\$40	\$760
5	Driveway Replacement	268	S.Y.	\$45	\$12,060
6	Storm Sewer Replacement	300	L.F.	\$11	\$3,300
7	1 ½" Service Line	1,300	L.F.	\$12	\$15,600
8	3" Force Main	200	L.F.	\$13	\$2,600
9	Grinder Pump	15	Each	\$7,200	\$108,000
10	Flushing Connection	3	Each	\$750	\$2,250
11	12" Steel Casing Pipe	120	L.F.	\$250	\$30,000
12	Seeding, Mulching, & Rest.	1	L.S.	\$20,000	\$20,000
13	Preconstruction Video	1	L.S.	\$2,000	\$2,000
14	Traffic Maintenance	1	L.S.	\$3,500	\$3,500
15	Mobilization and Bonds	1	L.S.	\$20,000	\$20,000
	SUBTOTAL				\$424,520
	Contingencies (10%)				\$42,452
	TOTAL OPINION OF CONSTRUCTION COST				\$466,972
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$84,904
	TOTAL OPINION OF PROBABLE COSTS				\$551,876
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				



- Existing Sanitary MH
- SA-15 Proposed PS
- SA-15 Proposed Sanitary
- SA-15 Proposed FM
- Existing Gravity Sewers



D. HEYMAN
4/27/2014
PDG JOB# 3185-039
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**CRITICAL AREA - SA-15
BALLVILLE AND SANDUSKY TOWNSHIPS
SANDUSKY COUNTY, OHIO
PLATE G-7**

**SANDUSKY COUNTY
COMPREHENSIVE WATER & SEWER
GENERAL PLAN**



Estimated construction costs for sanitary sewer service are listed as follows:

TABLE G-27 HAYES AVENUE (SA-15) CONVENTIONAL GRAVITY SEWERS					
Item No.	Description	Quantity	Unit	Unit Cost	Cost
1	8" Gravity Sanitary Sewers	4,350	L.F.	\$65	\$282,750
2	6" Sanitary Laterals	36	Each	\$1,300	\$46,800
3	Manholes	12	Each	\$3,500	\$42,000
4	Asphalt Pavement Replacement	86	S.Y.	\$40	\$3,440
5	Driveway Replacement	655	S.Y.	\$45	\$29,475
6	Seeding, Mulching, & Rest.	1	L.S.	\$25,000	\$25,000
7	Storm Sewer Replacement	950	L.F.	\$11	\$10,450
8	6" Diameter Force Main	1,780	L.F.	\$30	\$53,400
9	Pump Station	1	Each	\$150,000	\$150,000
10	Preconstruction Video	1	L.S.	\$2,500	\$2,500
11	Traffic Maintenance	1	L.S.	\$7,500	\$7,500
12	Mobilization and Bonds	1	L.S.	\$27,000	\$27,000
	SUBTOTAL				\$680,315
	Contingencies (10%)				\$68,032
	TOTAL OPINION OF CONSTRUCTION COST				\$748,347
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$136,063
	TOTAL OPINION OF PROBABLE COSTS				\$884,410
	Notes: Project estimate assumes no rock excavation required and abandonment of septic tanks is the responsibility of the homeowner				