

MADISON TOWNSHIP

The township is located in the west central area of Sandusky County and the 2010 census stated that 1,273 people live in the unincorporated portions of the Township. The total land area is 27.3 square miles at an elevation of 679 feet. The Village of Gibsonburg is the only incorporated community in the Township. There are 141 people/square miles which includes the Village of Gibsonburg. Rollersville is an unincorporated community on the border between Madison and Scott Township. It is located on US Route 6 approximately 4.5 miles west of Helena.

The Village of Gibsonburg is located in the northeast corner of Madison Township. The Village's 2010 Census listed the population at 2,581 and its total land area is at 2.88 square miles at an average elevation of 686 feet. There are 1,075 people per square mile. Additional demographic and population projections for both Madison Township and the Village of Gibsonburg are as follows:

2010 DEMOGRAPHIC INFORMATION					
	2010 Census	Square Mile	Population/ Square Mile	MHI	LMI %
Madison Township	1,273	27.3	141	\$46,813	32.0
Village of Gibsonburg	2,581	2.88	1,075	\$43,690	37.6

20 YEAR PROJECTED DEMOGRAPHIC INFORMATION						
	2010 Population	2010 Estimated Water Demand (100 gpcd)	2010 Estimated Water Demand/ Square Miles	2030 Population Estimate**	2030 Estimated Water Demand (100 gpcd)	2030 Estimated Water Demand/ Square Mile
Madison Township*	1,273	127,300 gpd	5,213 gpd	1,198	119,800 gpd	4,388 gpd
Village of Gibsonburg	2,581	258,100 gpd	89,618 gpd	2,429	242,900 gpd	84,340 gpd
* Water demand without Gibsonburg						
** Ohio Department of Development - Sandusky County Projected Rate of Change - .059% to 2030						

Gibsonburg has several new areas identified by village officials as either future residential growth areas or industrial growth areas. Prominent among them was the Village's industrial park located east of downtown on SR 600. The township expects possible residential growth to the south west.¹

Groundwater Resources - The groundwater source for the entire township is from a carbonate aquifer which generally yields as much as 100 gpm at depths of less than 200 feet. There is a test well northeast of the Village of Gibsonburg that yields 150 gpm and two (2) industrial wells, one north and one south of the village that yields 80 to 100 gpm. The Village of Gibsonburg owns and operates a groundwater supply system that is supported by six (6) wells. Gibsonburg provides aeration and disinfection. Well No. 2 was removed from service due to trichloroethylene contamination. The raw water quality for the test well is listed as follows:

EXISTING WELL PRODUCTION AND WATER QUALITY	
	Test Well A
Depth (feet)	250
Bedrock (feet)	19
Yield (gpm)	150
Hardness (mg/l)	345
Iron (mg/l)	.73
Manganese (mg/l)	Not Tested
Dissolved Solids (mg/l)	388
Sulfates (mg/l)	71
Fluoride (mg/l)	Not Tested
Calcium	87

Surface Water Resources - There are a number of small creeks and ditches that flow northeast and discharge into Lake Erie. Madison Township is in the Portage River Watershed. The majority of the land cover within the watershed is agricultural. None of the tributaries in Madison Township would support a regional surface water supply. Hurlbut Ditch provides an outlet for the Village of

Gibsonburg's wastewater treatment facility. Atlas Industries discharges into Sugar Creek and US 6/23 Retail Sales discharges to Coon Creek.

Public Water Systems - The Village of Gibsonburg has the only municipal public water system in Madison Township. The village currently operates a groundwater system that includes aeration and disinfection. Finished water storage consists of a 500,000 gallon clearwell and a 250,000 gallon elevated tank. Gibsonburg's design flow is rated at 0.620 mgd and the current average daily flow is 0.374 mgd. The supply of raw water is pumped from five (5) wells. There are six (6) private public water systems in the Madison Township.

Wastewater Treatment Systems - There are currently three (3) NPDES permitted wastewater plants in the Township. The Village of Gibsonburg owns and operates a 0.500 mgd treatment plant that discharges into Hurlbut Ditch and State Route 300 ditch. The treatment process consists of an oxidation ditch and final clarifiers followed by disinfection. The wastewater treatment facility at this time has limited capacity. The current average daily flow is at 0.437 mgd. Atlas Industries located at 1520 County Road 42 operates a 3,000 gpd packaged treatment plant that discharges into Sugar Creek and US 6/23 Retail Sales operates a 5,000 gpd packaged treatment plant that discharges into Coon Creek. All three of these facilities discharge to the Portage River Watershed then to Lake Erie.

Proposed Water Service

White Star Park²

The existing planning area does not have a central water system. The water system consists of individual wells at each facility. The wells are considered public systems. The water quality is poor and significant treatment is required to make the water palatable and less prone to causing problems in the systems.

The five (5) wells are located throughout the park and service the maintenance shed, a couple of sinks in the campground and beach area and some sinks at the barn.

The Sandusky County Park District (SCPD) along with the Sanitary Engineer's Office is evaluating White Star Park's sanitary sewer system and the need to upgrade to the 21st century standards. The park would also like to abandon their existing water wells, individual water systems, and run a public water distribution system throughout the park. Both of these would allow the park to host bigger functions and park activities.

The recommended water supply alternative is the regional alternative to connect to the Village of Gibsonburg's public water system.

The maintenance shed, the campground facility, the beach house, and the barn already have running water to these structures from the existing wells. However, some plumbing within the building will still have to be completed in order to connect the water service to the proposed restroom facilities. A small waterline will have to be installed to the beach house restroom facility, the picnic area restroom, and the SCUBA Building.

Estimated Water Usage and Sanitary Sewage Flows

Based on the information provided by the SCPD and by using the Ohio EPA guidelines, average daily flows and peak daily flows were calculated for the different areas of the park. The design flows are as follows:

TABLE D-1 AVERAGE/PEAK DAILY WATER USAGE (GPD)			
	OEPA Guidelines	Avg. Daily Flows	Peak Daily Flows
Maintenance/EMS Building	assumed	10	33
Campground Area	60 gpd/site * 48 sites	2,880	9,500
Quarry Area/Beach Swim Area	5 gpd/person(s) * 333 person(s)	1,665	5,500
Barn/Banquet Hall	3 gpd/seat * 185 seats	555	1,830
SCUBA Building	5 gpd/person(s) * 63 person(s)	315	1,049
TOTAL		5,425	17,912

The estimated water usage was used to determine water main size and/or to size a groundwater system at the park.

Regional Treatment - Gibsonburg

Regional water supplies are becoming more prevalent with the proliferation of environmental regulations and the added responsibilities which they create. In recent years, increased levels of contaminants have affected both ground and surface water supply. Moreover, the regulations and costs of adequately treating water has affected many municipal and private water supplies. In the future, these costs and the level of treatment required could increase the desire to regionalize water systems or to look for alternative sources of raw water. Regulations for monitoring volatile organic chemicals, herbicides, pesticides, synthetic organic compounds, and heavy metals are but a few of the additional reporting requirements.

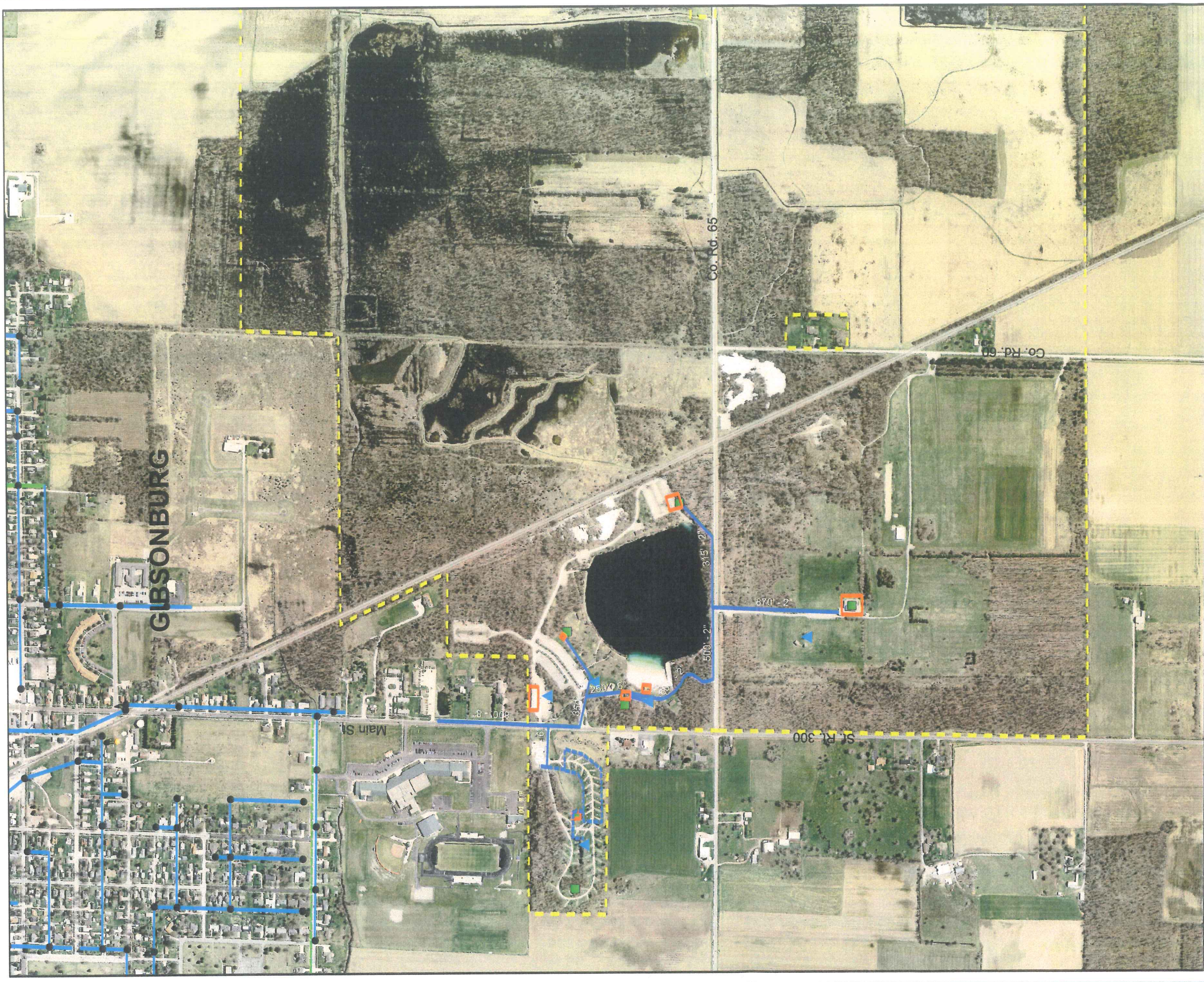
Cost of compliance with EPA regulations has risen sharply and can be expected to continue to rise as the national concern for health and the environment matures.

This alternative evaluates a regional approach for the delivery of potable water. A regional approach for the treatment of water would include the construction of an 8" diameter water transmission line from the Village of Gibsonburg to White Star Park. The community of Gibsonburg meets this requirement; the distance to the connection point within their water distribution is approximately 1,100 linear feet. The connection location would be at the south end of Gibsonburg on South Main Street, near Gibsonburg Middle School.

1. Advantages:
 - A. The Park District would not have the day to day responsibilities of running a water treatment plant or wells.

2. Disadvantages:
 - A. Would be affected by rate increases from Gibsonburg when they would need to make capital improvements to their treatment facility or treatment operational costs increase.

Plate D-1 from the White Star Park Engineering Report illustrates the proposed route for the water transmission line from Gibsonburg to White Star Park. Table D-2 lists estimated construction and project costs.



Existing		Proposed	
▲	Wells	—	Waterline
•	Manholes		
—	Combined Sewers		
—	Gravity Sewers		
—	Forcemain		
—	Waterlines		
■	Pit Latrine (to be abandoned)		
□	Existing Structures		
—	Park Boundary		
—	Corpline		

REFERENCE:
D. PLUMMER
12/09/2013

JOB# 3184-007
S\3184-007\PLATE8.MXD



PROPOSED WATERLINE
IMPROVEMENTS
ALTERNATE NO. 3
PLATE D-1

WHITE STAR PARK
WATER AND WASTEWATER
PRELIMINARY ENGINEERING
REPORT



TABLE D-2
ALTERNATIVE 3
OPINION OF PROBABLE COST
REGIONAL TREATMENT - GIBSONBURG

Item No.	Description	Quantity	Unit	Unit Price	Total Price
1	8" Ductile Iron Waterline	1,130	L.F.	\$35	\$39,550
2	8" Gate Valve and Box	2	Each	\$1,600	\$3,200
3	Connection to Existing Waterline	1	Each	\$1,500	\$1,500
4	Fire Hydrant Assembly	1	L.F.	\$3,900	\$3,900
5	Rock Excavation	500	C.Y.	\$66	\$33,000
6	Restoration (Includes Sidewalks, Driveways, Street Repair, Seeding, and Mulching)	1	L.S.	\$6,000	\$6,000
7	Storm Sewer Replacement	100	LF	\$10	\$1,000
8	Mobilization, Bonds, Surface Video, and Traffic Maintenance	1	L.S.	\$3,000	\$3,000
	SUBTOTAL				\$91,150
	Contingencies (10%)				\$9,115
	TOTAL OPINION OF CONSTRUCTION COST				\$100,265
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$18,230
	TOTAL OPINION OF PROBABLE COSTS				\$118,495

Water Purchase

Alternative No. 3 will include an annual cost associated with purchasing water from Gibsonburg. The Village of Gibsonburg currently supplies water to areas outside of their corporation limits. Outside rates are currently 1.5 times that of inside rates.

The Village's current monthly residential charge for water is as follows:

Base Rate charge = \$16.75/month

Volume charge = \$1.55/100 cubic feet

The estimated average monthly volume charge is based on the 153,300 gallons per month based upon current Village water service charges.

$$153,300 \text{ gallons/month} = 20,492 \text{ cubic feet/month} \div 100 \text{ cf billing units} = 204.9 \text{ units} \times \$1.55/\text{unit} \\ = \$317.60 \times 1.5 \text{ times for outside rate} = \$476.40$$

Estimated monthly water bill = \$493.15

Proposed Water Distribution System

As discussed previously, White Star Park has individual wells at each of its facilities. Because of that, a water distribution system needs to be installed in the park to transport the water from the water main extension from Gibsonburg to each of the facilities.

Waterlines are generally laid parallel to the surface of the ground, at a depth of not less than 4 feet and sometimes up to 5 feet to prevent freezing, and are, therefore, less subject to control by topography and subsurface conditions than sewerage systems. The major factor to be considered in the expansion of a water supply system is the capacity of the system to serve the expanded area. White Star Park is maxed out for future development.

The distribution system will include 6" and 2" diameter PVC waterline fittings, valves, and fire hydrants. The proposed water distribution is shown on Plate D-1 and the estimate of costs are listed on Table D-3.

TABLE D-3
 OPINION OF PROBABLE COST
 WHITE STAR PARK
 WATER DISTRIBUTION SYSTEM

Item No.	Description	Quantity	Unit	Unit Price	Total Price
1	6" Waterline	950	L.F.	\$30	\$28,500
2	2" Waterline	3,070	L.F.	\$15	\$46,050
3	Fire Hydrant Assembly	6	L.F.	\$3,900	\$23,400
4	Rock Excavation	1,300	C.Y.	\$66	\$85,800
5	6" Gate Valve	5	Each	\$1,200	\$6,000
6	Restoration (Includes Sidewalks, Driveways, Street Repair, Seeding, and Mulching)	1	L.S.	\$30,000	\$30,000
7	Storm Sewer Replacement	200	L.F.	\$10	\$2,000
8	Mobilization, Bonds, Surface Video, and Traffic Maintenance	1	L.S.	\$10,000	\$10,000
9	Abandon Wells per OEPA Standards	5	Each	\$2,500	\$12,500
	SUBTOTAL				\$244,250
	Contingencies (10%)				\$24,425
	TOTAL OPINION OF CONSTRUCTION COST				\$268,675
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$48,850
	TOTAL OPINION OF PROBABLE COSTS				\$317,525

Critical Sewage Areas:

The Sandusky County Health Department 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.

Sugar Creek (SA-04) and Rodriguez Street (SA-24) are listed as Critical Sewage Areas. The Sugar Creek (SA-04) Critical Sewage Area includes a large unincorporated area in Madison, Scott, and Woodville Townships. The Critical Sewage Area is identified by the Health Department with very low residential density. Due to the low residential density, sanitary sewer service to this area would be cost prohibitive.

Proposed Sanitary Sewer Service³

For Critical Sewage Area SA-24, the Sandusky County Commissioners authorized a Preliminary Engineering Report for Rodriguez Street Sanitary Sewer and Waterline Improvements. The feasibility study for sanitary sewers was completed due to the potential of Findings and Orders from Ohio EPA for failing on-site sewage disposal systems.

The planning area under consideration for this project includes the area of Rodriguez Street, in Madison Township. The project is adjacent to, but located outside of the corporation limits of the Village of Gibsonburg and includes approximately 3 acres.

Rodriguez Street is a small residential street adjacent to the corporation limits of the Village of Gibsonburg. This street provides the only access to seven (7) residential homes. One of these homes faces Yeasting Street, but the driveway access is from Rodriguez Street. The Village of Gibsonburg provides potable water to the residences and each homeowner has a private household sewage treatment system (HSTS). The Clearview Industrial Park borders the proposed project site.

Residents along Rodriguez Street have household sewage treatment system (HSTS) that are failing. The EPA is currently monitoring the area and Findings and Orders may be pending. The installation of a public sanitary sewer collection system would eliminate this source of pollution.

This unincorporated area on Yeasting Street east of Park includes the private road of Rodriguez Street to the south of Yeasting Street. There is presently a 4" diameter force main on Yeasting Street from the east that is capped off at each end. It will serve as the conduit for sewage coming from the new Clearview Industrial Park, located directly east of Rodriguez Street, and presently completing site work. Presently there is a 1 ½" diameter force main coming from an individual company's pump station (Widmer Industry). There are no storm sewers in the incorporated area adjacent to this project location.

Sewer Collection System

There are presently two (2) force main lines going down Yeasting Street to a manhole - MH "A" located in the lawn of 717 Yeasting Street. There also is a solid lid storm water catch basin in the yard of 801 Yeasting that connects a 8" diameter sewer into Manhole "A". Manhole "A" outlet pipe presently goes north under Yeasting, down Park, to Madison Street; and, it is severely damaged going under Yeasting and is in need of repair. The existing combined sewer flowing to Madison from the south comes into the manhole at Madison below the invert of the sewer line leaving this manhole. This existing 8" diameter line is therefore always surcharged due to the elevation problem. This sewer on Park Street needs to be reworked in any alternative suggested for Rodriguez Street improvements. Additionally, in all cases, any property owner connecting into the new sanitary sewer system to the Village needs to have an approved septic tank. It should also be noted that there is not enough drop in the existing manhole elevations from Park and Madison (or Park and Yeasting) that would allow gravity being installed down Yeasting and down Rodriguez Streets.

The unincorporated area of Yeasting and Rodriguez Streets that are part of this project include 6 houses on Rodriguez Street with the following addresses:

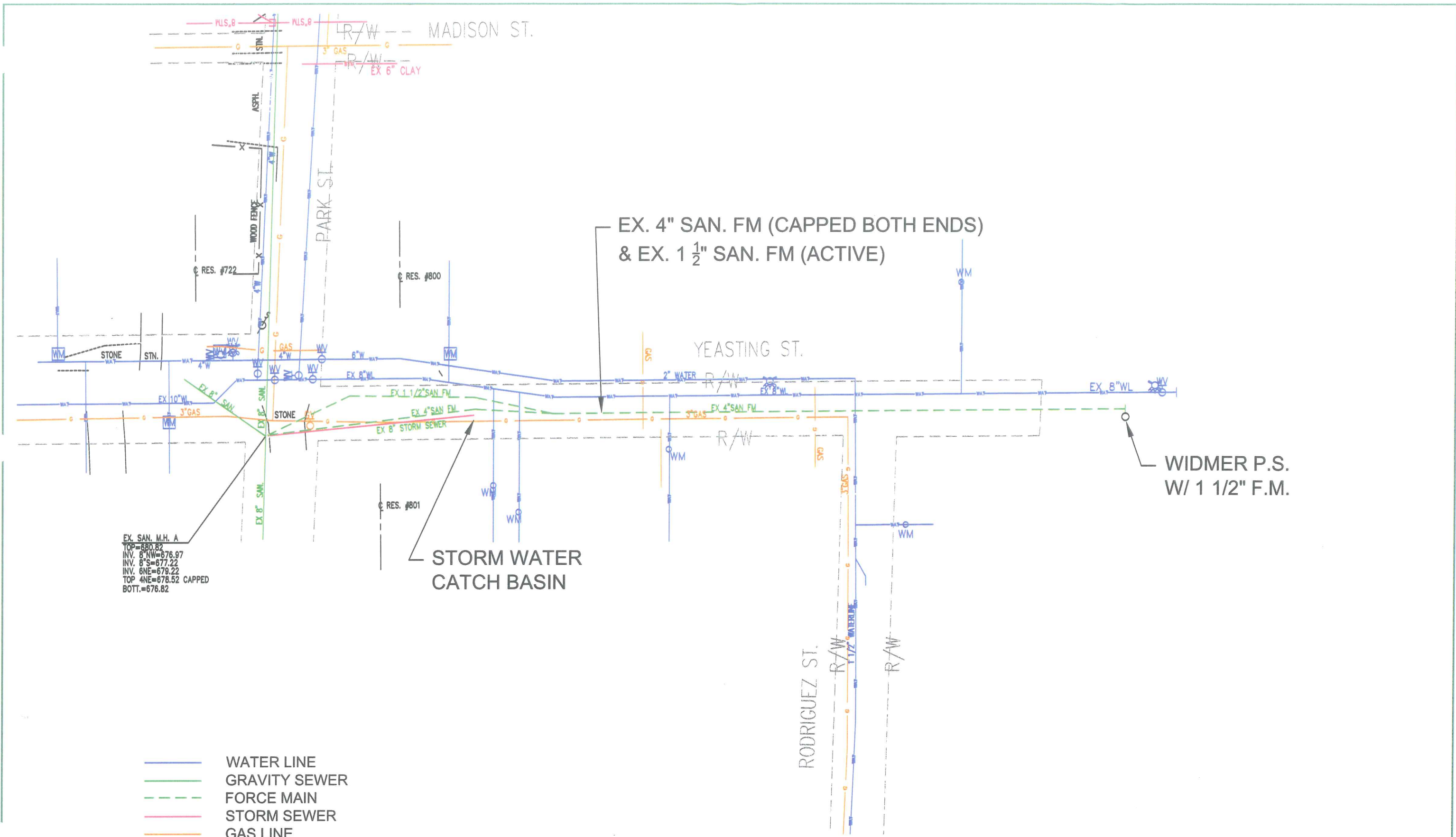
274, 262, 260	West Side
275, 261, 227	East Side

It also includes 10 home on Yeasting Street with the following addresses:

875, 813, 809, 805, 803, 801	South Side
878, 872, 866, 865	North Side

Each of these residents will require an approved septic tank along with a pumping unit to transfer its sewage into a force main. An existing 4" diameter force main was previously installed at the same time that a 1 ½" diameter force main was constructed from the 4 foot deep Manhole "A" easterly down Yeasting to a new pump station owned by Widmer Industry. The 4" force main extends past the pump station and into the Clearview Industrial Park. It is capped on both ends presently; but, it will be activated once the site work is completed at the industrial park. This force main could then be utilized also for transfer of sewage from most of the aforementioned residents on Yeasting. As part of this proposed project, the six (6) residents on Rodriguez as well as two (2) homes on south side of Yeasting at the corner of Rodriguez will require a new force main installed on Rodriguez and connecting into the existing 4" diameter force main.

There appears to be only one option for the sewage collection system connecting into the Village of Gibsonburg's sewers. There is a need to replace the sewer line on Park from Yeasting to Madison due to structural problems and this sewer being full of sewage at times near the connecting sewer at Madison. Manhole "A" depth is 4; and, there is no adequate elevation differences to install gravity sewer upstream on Yeasting or Rodriguez. Besides, there is an existing unused 4" diameter force main that terminates into Manhole A. It is to become activated with the start up of the industrial park; and, it could also easily be utilized for area residents. The Sewer Probable Construction Cost can be seen in Table D-4.



EX. SAN. M.H. A
 TOP=680.82
 INV. 8"NW=676.97
 INV. 8"S=677.22
 INV. 6"NE=679.22
 TOP 4"NE=678.52 CAPPED
 BOTT.=676.82

- WATER LINE
- GRAVITY SEWER
- - - FORCE MAIN
- STORM SEWER
- GAS LINE

EX. 4" SAN. FM (CAPPED BOTH ENDS)
 & EX. 1 1/2" SAN. FM (ACTIVE)

STORM WATER
 CATCH BASIN

WIDMER P.S.
 W/ 1 1/2" F.M.

REFERENCE:
 ACAD DWG
 R. JACKSON
 8/8/2013

JOB #3185-043
 FILE: PLATEB.DWG

EXISTING UTILITIES
 IN AREA

PLATE D-2

PRELIMINARY ENGINEERING REPORT
 RODRIGUEZ STREET ROADWAY
 AND UTILITY IMPROVEMENTS
 MADISON TOWNSHIP, SANDUSKY
 COUNTY



TABLE D-4
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE
RODRIGUEZ STREET SEWER IMPROVEMENTS
MADISON TOWNSHIP, SANDUSKY COUNTY

Item No.	Description	Quantity	Unit	Unit Price	Total Price
RODRIGUEZ STREET					
1	Septic Tanks to Effluent Pumps	6	Each	\$12,000	\$72,000
2	3" Diameter Force Main	342	L.F.	\$17	\$5,814
3	Connection to Existing 4" Force Main with tee and 3" Plug Valve and Valve Box	1	Each	\$1,500	\$1,500
4	1" Diameter Septic Tank Discharges to Force Main	300	L.F.	\$9	\$2,700
5	Incidentals	1	L.S.	\$1,500	\$1,500
6	Restoration	1	L.S.	\$3,000	\$3,000
7	Traffic Control	1	L.S.	\$500	\$500
8	Bonds, Mobilization, and Insurance	1	L.S.	\$2,000	\$2,000
SUBTOTAL Rodriguez Street					\$89,014
YEASTING STREET					
1	Septic Tanks to Effluent Pumps	10	Each	\$12,000	\$120,000
2	1" Diameter Septic Tank Discharges to Force Main	500	L.F.	\$9	\$4,500
3	Lateral Connection into Existing 4" Diameter Force Main	8	Each	\$500	\$4,000
4	Incidentals	1	L.S.	\$1,500	\$1,500
5	Restoration	1	L.S.	\$3,000	\$3,000
6	Traffic Control	1	L.S.	\$500	\$500
7	Bonds, Mobilization, and Insurance	1	L.S.	\$2,500	\$2,500
SUBTOTAL Yeasting Street					\$136,000
PARK STREET					
1	15" Sanitary Sewer	415	L.F.	\$75	\$31,125
2	Manhole Rework Along with Core Drilling	2	Each	\$3,000	\$6,000
3	Service Reconnections on Park Street	3	Each	\$1,300	\$3,900

TABLE D-4
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE
RODRIGUEZ STREET SEWER IMPROVEMENTS
MADISON TOWNSHIP, SANDUSKY COUNTY

Item No.	Description	Quantity	Unit	Unit Price	Total Price
4	Abandon Existing 8" sewer	1	L.S.	\$1,300	\$1,300
5	Rock Excavation ,0.4 C.Y. Rock/LF	166	C.Y.	\$75	\$12,450
6	Incidentals	1	L.S.	\$1,000	\$1,000
7	Traffic Control	1	L.S.	\$500	\$500
8	Bonds, Mobilization, and Insurance	1	L.S.	\$1,500	\$1,500
	SUBTOTAL Park Street				\$57,775
	SUBTOTAL ALL STREETS				\$282,789
	Contingencies (10%)				\$28,279
	Easements \$500 each (Rodriguez-6, Yeasting- 10)				\$8,000
	TOTAL ESTIMATED CONSTRUCTION TOTAL				\$319,068

White Star Park

The planning area under consideration for this project has been established as White Star Park South of the Penn Central Railroad. White Star Park is located approximately 1/4 mile south of the Village of Gibsonburg.

The Village of Gibsonburg is located in the Portage River Basin which drains 581 square miles. The Portage River Basin drains north to northeast with head water as far south as Northern Hancock County with the majority of tributaries located in Wood and Sandusky County.

The planning area drains into Nine Mile Creek which then connects north into the North Branch of the Portage River.

Currently, White Star Park is not served by a public collection and/or treatment facility. The maintenance shed/EMS building has a leach field and a septic tank. The campground area West of State Route 300 consists of four, 1,000 gallon tank latrines. The beach area has two, 1,000 gallon tank latrines. Two 1,000 gallon pit latrines are located in the picnic area. The scuba area

at the back of the park consists of two, 1,500 gallon tank latrines and the barn at the South end of the park has two, 2,000 gallon pit latrines. These pit latrines are currently located under each building structure and are currently pumped one time a year by Adkins Sanitation Ltd. and the waste is disposed of at the Fremont Wastewater Treatment Plant.

The Sandusky County Park District (SCPD) along with the Sanitary Engineer's Office is evaluating White Star Park's sanitary sewer system and the need to upgrade to the 21st century standards. The park would also like to abandon their existing water wells, individual water systems, and run a public water distribution system throughout the park. Both of these would allow the park to host bigger functions and park activities.

It would appear that shallow limestone throughout the planning area will result in rock excavation for the water supply and sewer collection system alternatives. Rock excavation will also be taken into consideration for a regional wastewater connection to a nearby village of Gibsonburg that could provide treatment.

Recommendations

Based on the findings of this study, the recommended wastewater treatment alternative is to construct a small diameter, shallow force main sewer system throughout the park including a septic tank and a grinder pump for each facility to be served as shown on Plate D-3. This force main will be connected to the Village of Gibsonburg's sanitary sewer system. Due to the rock in the area, constructing a gravity sanitary sewer system would not be feasible or cost effective, which is the reason this alternative has not been considered. The construction of a wastewater treatment plant would also not be cost effective. This alternative requires, along with the actual treatment plant, additional costs of a pump station, a railroad crossing and permits, and the construction of an outlet structure in the wetland area East of the Penn Central Railroad.

The existing pit latrines at the West end of the camp ground and at the East end of the quarry may be abandoned depending on the SCPD's necessity to have facilities located in these two areas.

Based on the information provided by the SCPD and by using the Ohio EPA guidelines, average daily flows and peak daily flows were calculated for the different areas of the park. The design flows are as follows:

TABLE D-5 AVERAGE/PEAK DAILY WATER USAGE (GPD)			
	OEPA Guidelines	Avg. Daily Flows	Peak Daily Flows
Maintenance/EMS Building	assumed	10	33
Campground Area	60 gpd/site * 48 sites	2,880	9,500
Quarry Area/Swim Area	5 gpd/person(s) * 333 person(s)	1,665	5,500
Barn/Banquet Hall	3 gpd/seat * 185 seats	555	1,830
TOTAL		5,110	16,863

The wastewater generated at each of these facilities will be assumed to be equal to the water usage. The estimated water usage was used to determine water main size and/or to size a groundwater system at the park.

The sanitary flows were used to determine the pipe sizes of the gravity sewers and/or of the force mains to service White Star Park.

Alternative No. 1. Septic Tank – Small Diameter, Shallow Force Main Sewer System

A small diameter, shallow force main sewage collection system is designed to convey septic tank effluent in small diameter sewer pipes to a regional sewer system, in this case, the Village of Gibsonburg. The use of smaller diameter pipe is made possible by the fact that septic tank effluent represents primary settled wastewater, thus is low in settleable solids. This force main system has some advantages over the conventional gravity sewer system in that the smaller diameter pipe reduces both the material costs and the excavation costs. Also, the gravity system would be considerably deeper in order to achieve the required slopes set forth by the OEPA and a pump station would be needed to lift the waste material into the existing Village of Gibsonburg's sewer which is only five foot in depth at the connection point. Much of the sub-grade of White Star Park consists of rock and to excavate through this rock to install a sanitary sewer by gravity will increase

the cost of the project considerably. This savings, however, is offset to some degree by the need for installing a septic tank and grinder pump at each facility which meets the water tightness requirements imposed by the system design criteria. Another disadvantage of the system lies in the added operation and maintenance cost associated with regular cleaning of the septic tanks and the clearing of blockages caused by malfunctioning grinder pumps. The opinion of probable cost for Alternative No. 1 is \$546,241 as shown in Table D-6 and the operation and maintenance of this system is \$3,700 as shown in Table D-7.

<p style="text-align: center;">TABLE D-6 ALTERNATIVE 1 OPINION OF PROBABLE COST SEPTIC TANK – SMALL DIAMETER, SHALLOW FORCE MAIN SEWER SYSTEM DESIGN FLOW - 5,000 GPD</p>					
Item No.	Description	Quantity	Unit	Unit Price	Total Price
1	4" Low Pressure Force Main	1,600	L.F.	\$23	\$36,800
2	2" Low Pressure Force Main	5,370	L.F.	\$13	\$69,810
3	1 ¼" Low Pressure Force Main(25' to Building)	165	L.F.	\$11	\$1,815
4	Rock Excavation (assume 2' Dp. x 2' W x L)	1,060	C.Y.	\$66	\$69,960
5	New Septic Tank	6	Each	\$4,000	\$24,000
6	Simplex Grinder Pump Stations and Electrical	6	Each	\$7,600	\$45,600
7	Restroom Facility Upgrades (Incl. Water Supply, Plumbing, & Toilets)	5	Each	\$25,000	\$125,000
8	Storm Sewer Replacement	200	L.F.	\$11	\$2,200
9	Surface Video, Mobilization, and Insurance	1	L.S.	\$13,000	\$13,000
10	Restoration Includes Sidewalks, Driveways, Street Repair, and Seeding and Mulching	1	L.S.	\$32,000	\$32,000
	SUBTOTAL				\$420,185
	Contingencies (10%)				\$42,019
	TOTAL OPINION OF CONSTRUCTION COST				\$462,204
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$84,037
	TOTAL OPINION OF PROBABLE COSTS				\$546,241
Notes: Estimated costs based on 2014 bidding and construction.					

TABLE D-7
ALTERNATIVE 1
OPERATION AND MAINTENANCE
SEPTIC TANK - SMALL DIAMETER,
SHALLOW FORCE MAIN SEWER SYSTEM
DESIGN FLOW - 5,500 GPD

Item	Estimated Annual Cost
	Initial
Labor	\$1,100.00
Utilities	\$100.00
Miscellaneous and Repairs	\$500.00
Gibsonburg Treatment Cost*	\$2,000.00
TOTAL	\$3,700.00
*Based on 5,500 gpd. design flow. The actual costs and the metering options will be determined during the design phase of the project.	

Alternative No. 1 was also divided into two different phases. Phase one costs consists of the installation of the force main, septic tanks, grinder pumps, and facility upgrades to serve the maintenance/EMS building, the campground area, the beach area, and the picnic area. The opinion of probable cost to complete Phase One is \$340,067 as shown in Table D-8.

Phase Two costs consists of the installation of a force main from a connection point in phase one to the South to the barn and SCUBA Building along with septic tanks and grinder pumps. The opinion of probable cost for the Phase Two construction will be \$206,174 as shown in Table D-9.

TABLE D-8
 ALTERNATIVE 1 - PHASE 1
 OPINION OF PROBABLE COST
 SEPTIC TANK – SMALL DIAMETER,
 SHALLOW FORCE MAIN SEWER SYSTEM

Item No.	Description	Quantity	Unit	Unit Price	Total Price
1	4" Low Pressure Force Main	1,600	L.F.	\$23	\$36,800
2	2" Low Pressure Force Main	2,300	L.F.	\$13	\$29,900
3	1 ¼" Low Pressure Force Main (25' to Building)	120	L.F.	\$11	\$1,320
4	Rock Excavation (assume 2' Dp. x 2' WxL)	650	C.Y.	\$66	\$42,900
5	New Septic Tank	4	Each	\$4,000	\$16,000
6	Simplex Grinder Pump Stations and Electrical	4	Each	\$7,600	\$30,400
7	Restroom Facility Upgrades (Incl. Water Supply, Plumbing, & Toilets)	3	Each	\$25,000	\$75,000
8	Storm Sewer Replacement	170	L.F.	\$11	\$1,870
9	Surface Video, Mobilization, and Insurance	1	L.S.	\$8,400	\$8,400
10	Restoration Includes Sidewalks, Driveways, Street Repair, and Seeding and Mulching	1	L.S.	\$19,000	\$19,000
	SUBTOTAL				\$261,590
	Contingencies (10%)				\$26,159
	TOTAL OPINION OF CONSTRUCTION COST				\$287,749
	Other Fees (20%) Legal, Design, Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees				\$52,318
	TOTAL OPINION OF PROBABLE COSTS				\$340,067

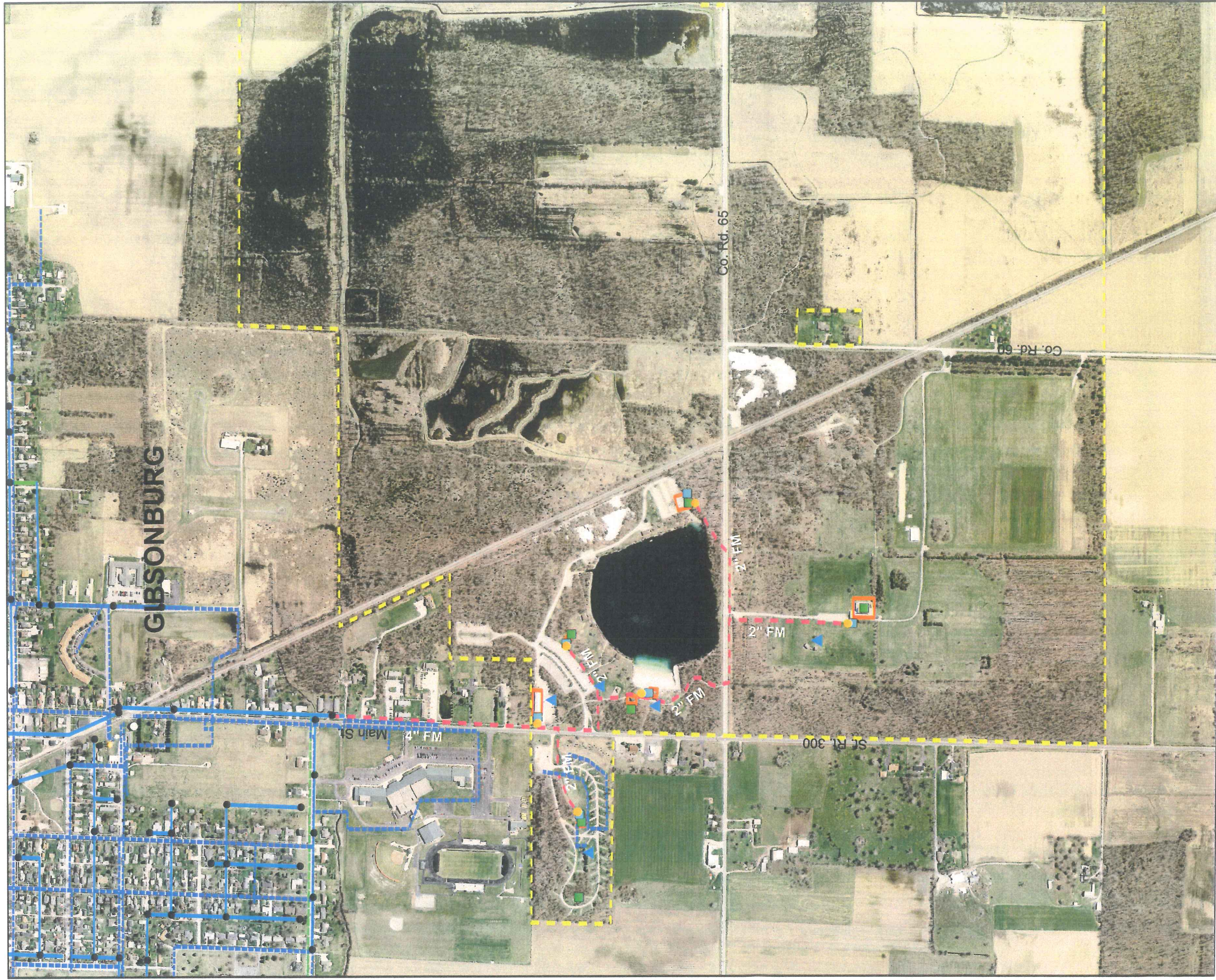
Notes: Estimated costs based on 2014 bidding and construction.

TABLE D-9
 ALTERNATIVE 1 - PHASE 2
 OPINION OF PROBABLE COST
 SEPTIC TANK – SMALL DIAMETER,
 SHALLOW FORCE MAIN SEWER SYSTEM

Item No.	Description	Quantity		Unit Price	Total Price
1	2" Low Pressure Force Main	3,070	L.F.	\$13	\$39,910
2	1 ¼" Low Pressure Force Main (25' to Building)	45	L.F.	\$11	\$495
3	Rock Excavation (assume 2' Dp. x 2' W x L)	410	C.Y.	\$66	\$27,060
4	New Septic Tank	2	Each	\$4,000	\$8,000
5	Simplex Grinder Pump Stations and Electrical	2	Each	\$7,600	\$15,200
6	Restroom Facility Upgrades (Incl. Water Supply, Plumbing. & Toilets)	2	Each	\$25,000	\$50,000
7	Storm Sewer Replacement	30	L.F.	\$11	\$330
8	Surface Video, Mobilization, and Insurance	1	L.S.	\$4,600	\$4,600
9	Restoration Includes Sidewalks, Driveways, Street Repair, and Seeding and Mulching	1	L.S.	\$13,000	\$13,000
	SUBTOTAL				\$158,595
	Contingency (10%)				\$15,860
	TOTAL ESTIMATED CONSTRUCTION COST				\$174,455
	Other Fees (20%) (Legal, Design Engineering, Financing, Construction Observation, Testing, Interest During Construction, and Review Fees)				\$31,719
	TOTAL ESTIMATED PROJECT COST				\$206,174

Notes: Estimated costs based on 2014 bidding and construction.

2



Existing		Proposed	
▲	Wells	●	Grinder Pump
●	Manholes	■	Septic Tank
—	Combined Sewers	—	Forcemain
—	Gravity Sewers		
—	Forcemain		
—	Waterlines		
■	Pit Latrine (to be abandoned)		
□	Existing Structures		
—	Park Boundary		
—	Corpline		

REFERENCE:
D. PLUMMER
12/09/2013

JOB# 3185-039
S:\3184-007\
PLATED3.MXD



PROPOSED SANITARY
IMPROVEMENTS
ALTERNATE NO. 1
PLATE D-3

WHITE STAR PARK
WATER AND WASTEWATER
PRELIMINARY ENGINEERING
REPORT

