

MOUNTAIN WATER DISTRICT LOWER SHELBY 201 FACILITIES PLAN

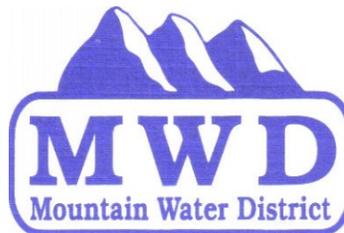
PIKE COUNTY, KENTUCKY

6375.047



Prepared for:
Mountain Water District
Pike County, Kentucky

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SECTION 1 – REGIONAL FACILITY PLAN SUMMARY

1.1 PURPOSE

The Pike County Fiscal Court has authorized Summit Engineering, Inc. to prepare a Regional Facility Plan Update to the Lower Shelby Creek Facility Planning Area. The existing Regional Facility Plan covers a portion of the Shelby Creek watershed in southern Pike County. The proposed additions to the existing area are along the Levisa Fork between Fords Branch and Marrowbone to the north, and further along Shelby Creek and its tributaries to the south (See **Exhibit 3-1**). The goal of this plan is to evaluate the collection, conveyance, and treatment of wastewater for a 20-year period within this planning area. This evaluation will be incorporated into the existing plan as an update in order to comply with 401 KAR 5:006.

The existing Planning Area is anchored by the Douglas Wastewater Treatment Plant. The current capacity of the plant is 0.2 MGD. A proposed expansion will increase capacity to 0.3 MGD in the near future. The existing collection system consists of approximately 145,000 linear feet of force main serving approximately 726 customers.

The estimated population within the existing 38.5 square mile Planning Area is 7,756 individuals. The estimated population within the proposed 30.9 square mile addition to the Planning Area is 6,836 individuals. No growth is anticipated based upon estimates from the Kentucky State Data Center. Residents in the proposed Planning Area addition and portions of the existing Planning Area rely on package plants, septic tanks, or straight pipe discharges for the disposal of sanitary wastewater. Most of these systems are of unknown size and/or design standards. Straight pipe discharges are a source of contamination to the many streams in the area and a cause of concern to both public health and the environment.

The purpose of this Facility Plan Update is to determine the most economical, effective, environmentally sound, and feasible wastewater collection and treatment system for the Lower Shelby Planning Area.

1.2 RECOMMENDED ALTERNATIVE

Various alternatives were considered for treatment and collection of sanitary waste within the Planning Area. These are summarized below:

COLLECTION	TREATMENT
No Action	No Action
Pressure Sewer	Expand Existing Plant
Gravity Sewer	Build New Plant at Site

A life cycle cost analysis of each system revealed that pressure sewers are the most cost effective method of collecting wastewaters in the Planning Area. An extension of the existing collection system to additional areas is proposed, with the collected wastewater being treated at the existing Douglas Wastewater Treatment Plant. Upgrades to the existing Douglas WWTP are proposed to accommodate the additional flow. Phasing is based on three planning periods as suggested by

Division of Water’s guidelines: 0 – 2 Years (2016-2018), 3 – 10 Years (2019-2026), and 11 – 20 (2027-2036) Years.

1.3 ESTIMATED COST

See Appendix D for opinions of probable project costs.

The Mountain Water District proposes to charge rates consistent with those established in the existing Planning Area. These are as follows:

First 2,000 Gallons	\$14.00 Minimum Bill
All Over 2,000 Gallons	\$6.00 per 1,000 Gallons

1.4 PLANNING AGENCY COMMITMENTS

The Mountain Water District is the lead agency for this Regional Facility Plan. The following information is provided to document the legal standing to implement this project:

1. Appendix G: A signed ordinance defining the creation and legal standing of the Mountain Water District.

1.5 SCHEDULE OF IMPLEMENTATION

1.5.1 PLANNING PHASE 0 TO 2 YEARS

The recommended plan proposes to upgrade the Douglas Wastewater Treatment Plant from the current 200,000 GPD to 300,000 GPD during this phase at an estimated cost of \$2,800,000. The plan also proposes to extend the collection system to serve 150 structures within the 0 to 2-year period at an estimated project cost of \$2,691,981.

1.5.2 PLANNING PHASE 3 TO 10 YEARS

The recommended plan proposes to extend the collection system to serve 678 structures within the 3 to 10-year period at an estimated project cost of \$12,608,083.50. No improvements to the Douglas Wastewater Treatment Plant are anticipated in this phase.

1.5.3 PLANNING PHASE 11 TO 20 YEARS

The recommended plan proposes to extend the collection system to serve 866 structures within the 11 to 20-year period at an estimated project cost of \$19,802,269.50. Improvements will be necessary at the Douglas WWTP to accommodate the additional flow. It is unrealistic to project the cost of treatment expansion this far into the future due to rising costs of construction.

**TABLE 1-1
LOWER SHELBY 201 FACILITIES PLAN
0-20 YEAR PLANNING PERIOD PROJECTS
PRELIMINARY PROJECTS IMPLEMENTATION SCHEDULE**

Area #	Proposed Service Area	Planning Period	Planning Period									
			0-2 Year		3-10 Year							
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Douglas WWTP Expansion to 300,000 GPD	0-2 Year										
2	Buckfield	0-2 Year										
3	Branham Heights	0-2 Year										
4	Shelbiana	0-2 Year										
5	Little Creek	3-10 Year										
6	Robinson Creek	3-10 Year										
7	Sugar Camp	3-10 Year										
8	Little Robinson	3-10 Year										

Area #	Proposed Service Area	Planning Period	Planning Period									
			11-20 Year									
			2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
9	Douglas WWTP Expansion to 500,000 GPD	11-20 Year										
10	Upgrade Existing Caney and Penny Road Line	11-20 Year										
11	Indian Creek - Section 1	11-20 Year										
12	Indian Creek - Section 2	11-20 Year										
13	Indian Creek - Section 3	11-20 Year										
14	Jonancy - Section 2	11-20 Year										
15	Long Fork - Section 2	11-20 Year										
16	Caney Creek - Section 1	11-20 Year										
17	Caney Creek - Section 2	11-20 Year										
18	Caney Creek - Section 3	11-20 Year										

Notes:

1. Each implementation bar includes all funding acquisition, design, permitting, bidding, and construction work items.

SECTION 2 – STATEMENT OF PURPOSE AND NEED

2.1 REQUIREMENTS

2.1.1 REQUIREMENTS PURSUANT TO 401 KAR 5:006 SECTION 2

The Mountain Water District proposes to upgrade the existing Douglas Wastewater Treatment Plant. The current design capacity is 200,000 GPD. The proposed upgrades would increase design capacity by fifty percent (50%) to 300,000 GPD.

The Mountain Water District also proposes to extend the existing wastewater collection system to additional areas. These additional areas increase the equivalent population of the Planning Area by approximately fifty percent (50%).

2.1.2 WATER QUALITY AND PUBLIC HEALTH

The basis of need for this Facility Plan Update is as follows:

- A. To provide more residents and businesses within the Planning Area access to municipal wastewater collection and treatment.
- B. To foster the economic growth of the community by eliminating the impediment to new construction posed by the lack of a reliable public wastewater collection and treatment system.
- C. To improve the water quality of the Route 80: Shelby to Millard Service Area, the Shelby Creek Service Area, and their tributaries by eliminating existing package plants, septic tanks and straight pipe discharges of raw sewage.

Currently the residents of the proposed Planning Area and those yet to be served in the existing Planning Area have limited options to dispose of wastewater. These options include using privately owned treatment plants, septic tanks, or straight pipe discharges. Of these options, straight pipes are the greatest threat to water quality and consequently the least desirable option for wastewater disposal. Privately owned treatment plants and septic tanks can provide adequate treatment but are often neglected by their owners. Neglect increases the possibility of system failure resulting in the direct discharge of untreated wastewater into the environment. This effectively turns the treatment system into a straight pipe. Untreated wastewater discharges are a direct source of contamination to the downstream residents and ecosystem.

History shows that a municipally owned collection and treatment system generally provides a superior alternative to handling wastewater than the previously mentioned options. Municipally owned systems are professionally maintained and can provide a consistent level of treatment for many years. Additionally, the economy of scale provides treatment at a reduced monetary cost than individual treatment units. This economy reduces the capital and operating cost associated with existing and future commercial and industrial users, thereby encouraging economic growth.

SECTION 3 – PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

3.1 PLANNING AREA DELINEATION

The Lower Shelby Planning Area (**Exhibit 3-1**) was sub-divided into sewer service areas based principally on watershed boundaries. The proposed sewer service areas and the anticipated period for their connection to the Wastewater Treatment Plant are presented in Table 3-1. The areas to be served are divided into three (3) distinct periods for connection to the treatment facility. Phase 1 occurs between 0 and 2 years (2012-2014), Phase 2 between 3 and 10 years (2015-2022), and Phase 3 between 11 and 20 years (2023-2032). Proposed planning period phases are shown on **Exhibit 3-2**.

**Table 3-1
Planning Areas and Planning Periods Summary**

Area #	Proposed Service Area	Planning Period
1	Douglas WWTP Expansion to 300,000 GPD	0-2 Year
2	Buckfield	0-2 Year
3	Branham Heights	0-2 Year
4	Shelbiana	0-2 Year
5	Little Creek	3-10 Year
6	Robinson Creek	3-10 Year
7	Sugar Camp	3-10 Year
8	Little Robinson	3-10 Year
9	Douglas WWTP Expansion to 500,000 GPD	11-20 Year
10	Upgrade Existing Caney and Penny Road Line	11-20 Year
11	Indian Creek - Section 1	11-20 Year
12	Indian Creek - Section 2	11-20 Year
13	Indian Creek - Section 3	11-20 Year
14	Jonancy - Section 2	11-20 Year
15	Long Fork - Section 2	11-20 Year
16	Caney Creek - Section 1	11-20 Year
17	Caney Creek - Section 2	11-20 Year
18	Caney Creek - Section 3	11-20 Year

3.2 PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

3.2.1 FLOOD PLAIN

Exhibit 3-3 provides a map showing the 100-year flood plain in relation to the Planning Area, as per FEMA Flood Insurance Rate Map (FIRM) data. Some tributaries of Shelby Creek and the Levisa

Fork have undetermined floodplain elevations. All controls for pump stations will be located above the 100-year flood elevation.

3.2.2 TOPOGRAPHY

Steep, irregular mountains with narrow, winding valleys characterize the Planning Area. Major streams have floodplains of moderate width; however most streams have a confined, narrow valley floor. Elevations in the Planning Area range from over 2,800 ft. MSL at Flatwoods to approximately 680 ft. MSL at Shelbiana.

3.2.3 LAND USE

A land use map is provided as **Exhibit 3-4**. Most of the area is best described as unmanaged hardwood forest. The relatively narrow valley floors are urbanized and are best described as rural residential. With the exception of small residential garden plots, there is essentially no agriculture in Pike County.

3.3 MAN-MADE FEATURES

3.3.1 ROADS

The Planning Area is served by U.S. Highway 23, a multi-lane, divided highway that spans the Big Sandy region of Kentucky. This arterial highway enters the state from Virginia to the south and from Ohio to the north. A second arterial highway, U.S. 460, is being relocated south of its current location and will connect U.S. 23 near Robinson Creek to the proposed Coalfields Expressway in Virginia. The new U.S. 460 is being constructed as a four-lane, divided highway similar to U.S. 23. These arterials are served by a number of winding and often narrow two-lane state and county roads.

3.3.2 WATER AND SEWER

The Douglas Wastewater Treatment Plant serves a portion of the existing Planning Area. The associated wastewater collection system consists primarily of force mains with sizes up to six inches in diameter. Five lift stations provide additional storage and hydraulic head for the collection system. The Mountain Water District also maintains a water distribution system in the Planning Area. No raw water intakes are located in the existing or proposed Planning Area.

3.3.3 MINING

The area has undergone extensive mining, as is typical of the entire Eastern Kentucky Coal Field region. The predominant mining practice in the area is surface mining, though some underground mining still takes place. Surface mining, also known as mountain-top removal, involves the extraction of coal by removing the overburden and placing it in nearby hollows. This practice significantly alters the topographical features of the landscape.

SECTION 4 – SOCIOECONOMIC CHARACTERISTICS OF THE PLANNING AREA

4.1 HISTORICAL, CURRENT, AND PROJECTED POPULATIONS

4.1.1 HISTORICAL POPULATION

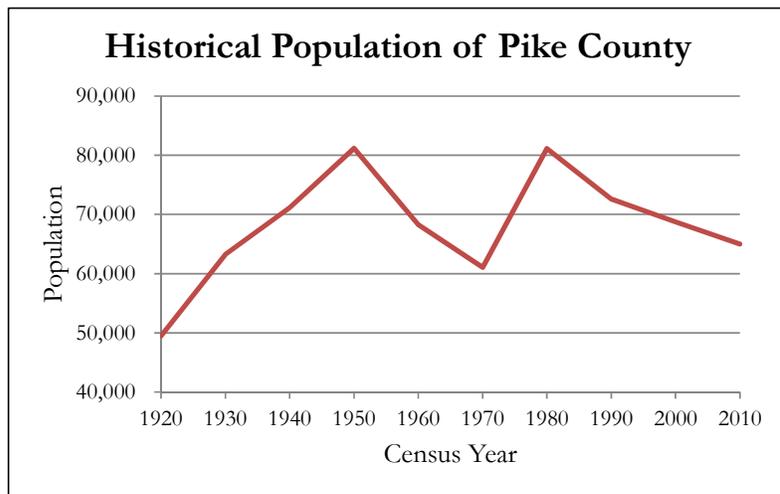
According to the Kentucky State Data Center at the University of Louisville, the population of Pike County shows negative growth between the two most recent decennial censuses. The total population of Pike County in the year 2000 was 68,736 persons. The total population in the year 2010 was 65,024. Table 4-1 below shows the historical population trends for Pike County.

**Table 4-1
Historical Population (Pike County)**

Year	Population	Percent Change
1920	49,477	-
1930	63,267	27.9%
1940	71,122	12.4%
1950	81,154	14.1%
1960	68,264	-15.9%
1970	61,059	-10.6%
1980	81,123	32.9%
1990	72,583	-10.5%
2000	68,736	-5.3%
2010	65,024	-5.4%

Notes:

1. Information obtained from U.S. Census Bureau.



4.1.2 CURRENT POPULATION

According to 2010 census data for Pike County, the current population density is 2.4 persons per household. Table 4-2 below shows the equivalent population of each service area within the Planning Area for the design year 0. **Exhibit 4-1** depicts the location of the proposed service areas.

**Table 4-2
Current Population (Year 0)**

Area #	Proposed Service Area	Population Equivalent
1	Douglas WWTP Expansion to 300,000 GPD	0
2	Buckfield	60
3	Branham Heights	96
4	Shelbiana	204
5	Little Creek	432
6	Robinson Creek	348
7	Sugar Camp	230
8	Little Robinson	617
9	Douglas WWTP Expansion to 500,000 GPD	0
10	Upgrade Existing Caney and Penny Road Line	0
11	Indian Creek - Section 1	178
12	Indian Creek - Section 2	278
13	Indian Creek - Section 3	276
14	Jonancy - Section 2	142
15	Long Fork - Section 2	408
16	Caney Creek - Section 1	286
17	Caney Creek - Section 2	163
18	Caney Creek - Section 3	348
PROJECTED EQUIVALENT POPULATION (2032) =		4,066

4.1.3 PROJECTED POPULATION

There are currently no planned residential developments within the Planning Area. Due to the fluctuating nature of the natural resources industry, this facilities plan will assume no change in existing population over the next 20 years.

4.2 CURRENT AND PROJECTED INDUSTRIAL AND COMMERCIAL USERS

A search of KPDES permits in the Shelby Valley area revealed that the Planning Area has no significant existing industrial wastewater customers, nor are there any proposed industrial developments within the Planning Area. The following Table 4-3 represents the anticipated flows created by the existing industrial and commercial users within the Planning Area.

Table 4-3
Current and Proposed Large Flow Contributors (0-20 Year Period)

Corresponding Planning Area # (Project Phase #)	Commercial and/or Industrial User	SIC Code	Population Equivalent
3	Branham Heights	6552	53
3	Spears Mobile Home Park	6515	19
4	Shelbiana Mobile Home Park	6515	41
6	Martins Mobile Home Park	6515	62
16	Newsome Building (Apartments)	6513	12
	TOTAL =		187

1. There are currently no proposed large developments to occur during 0-20 year planning period.

SIC Codes

6513 - Operators of Apartment Buildings

6515 - Operators of Residential Mobile Home Sites

6552 - Land Subdividers and Developers, Except Cemeteries

4.3 ECONOMIC AND SOCIAL IMPACT

Currently, no public wastewater collection or treatment systems are in place for the majority of the Planning Area. There is no public sewer available along U.S. 23 south of the intersection with Penny Road (KY 1469). Increased economic development is anticipated with the expanded availability of public sewers in the area, particularly along the U.S. 23 corridor. These developments will likely increase the tax base by creating jobs and encouraging new businesses.

SECTION 5 – EXISTING ENVIRONMENT IN THE PLANNING AREA

5.1 PHYSICAL

5.1.1 SURFACE AND GROUNDWATER RESOURCES

Shelby Creek is the primary watercourse draining the Planning Area. It flows into the Levisa Fork of the Big Sandy River at Shelbiana. Several smaller tributaries drain into Shelby Creek. The following water bodies are on the 305(b) list of water reports in the Integrated Reports to Congress on Water Quality in Kentucky:

- Caney Creek (0.0 to 1.5)
- Indian Creek (0.0 to 3.5)
- Levisa Fork (65.2 to 98.0, 98.0 to 101.25, 116.0 to 124.4)
- Little Fork (0.0 to 0.5)
- Long Fork (0.4 to 7.5)
- Rob Fork (0.0 to 1.0)
- Robinson Creek (0.0 to 2.1)
- Shelby Creek (0.0 to 6.0, 6.0 to 13.3)

None of the streams in the Planning Area are on the 303(d) list of water reports. Additionally, there are no streams designated as wild and scenic rivers within the Planning Area. The only stream listed on the river.gov website for Kentucky is the Red River located in the Daniel Boone National Forest.

In a recent study of the Big Sandy River Basin, the recommended criteria for fecal coliform was established as 200 colonies per 100 mL for two or more samples over a 30 day period, or a single count of 1,000 colonies per 100 mL water at any time. Some watersheds of the Big Sandy River Basin were found to exceed the single count level by two to three times the established limit. This high level of fecal coliform contamination in the watershed can partly be attributed to poorly installed or failing septic systems and straight-pipe discharges.

Groundwater information in this report was obtained from the Kentucky Geological Survey publication *Groundwater Resources of Pike County, Kentucky*. Groundwater hydrology is controlled by the underlying geological formations. The Planning Area is primarily composed of Alluvium and the Breathitt Formation. Alluvium is found in the flat areas in the valley floors along the principal streams and flood plains. This formation typically yields over 100 gallons per day in dug wells, with potential to produce in excess of 500 gallons per day under optimal conditions. The Breathitt Formation consists of sandstone in the narrow valleys with steep slopes and shale in the wide valleys with moderate slopes. This formation typically yields over 500 gallons per day to most wells dug in the valleys and hillsides, and over 100 gallons per day to most wells on the ridges.

Though public water is available in most of the Planning Area, many residents continue to use drilled wells. Groundwater in the area is often contaminated in objectionable amounts with naturally occurring sulfate, sodium chloride, iron, and manganese. Salt water can typically be found at depths of 50 feet or less to 2,000 feet below surface throughout the state. Abandoned oil and gas wells can cause contamination of fresh water aquifers by salt water from the deeper formations. The available groundwater resource varies significantly from season to season, with supplies diminishing rapidly in dry weather because of the rapid drainage and shallow soils of the area.

5.1.2 WETLANDS

A map showing the wetlands in the Planning Area is provided as **Exhibit 3-3**. The removal of straight pipes and failing septic systems is expected to improve the quality of streams and wetlands. The collector sewers and treatment system presented herein will be planned to avoid wetland areas. Stream crossings are often unavoidable and the appropriate stream crossing permits will be obtained as collector sewers are designed. The construction plans will incorporate sediment control measures to protect aquatic resources.

5.1.3 SOILS

Soils in the Planning Area are generally well-drained and loamy. The ridges consist of the very rocky Marrowbone-Dekalb-Muskingum complex. The hillsides are composed of a combination of the very stony Fedscreek-Gilpin-Marrowbone and Kimper-Sharondale-Muskingum complexes. The valley floors consist of a variety of flat to gently sloping loams. These include Hayter loam, Udorthents loam, Yeager loam, Grigsby-Yeager complex, Hayter-Potomac-Stokly complex, Myra very channery silt loam, Combs fine sandy loam, and Nelse loam.

5.1.4 GEOLOGY

The Planning Area is located in the Eastern Kentucky Coal Field physiographic region. The prevailing geological formations in the Planning Area are Alluvium and the Breathitt Group. Alluvium is composed of unconsolidated sediments from the current Quaternary Period and is found in the valleys along creeks and rivers. The Breathitt Group is composed of rocks of Pennsylvanian age from the Carboniferous Period, which consists primarily of sandstone and shale with significant coal and natural gas reserves.

5.1.5 TOPOGRAPHY

Steep, irregular mountains with narrow, winding valleys characterize the Planning Area. Major streams have floodplains of moderate width; however most streams have a confined, narrow valley floor. Most flat land is found in the valleys, though an increasing amount of flat land is being created on the ridges by surface mining. Elevations in the Planning Area range from over 2,800 ft. MSL at Flatwoods to approximately 680 ft. MSL at Shelbiana.

5.1.6 CLIMATE

The Planning Area climate is classified as humid temperate. Climatic data is based on historical data for the eastern Kentucky region from 1895 to 2005 obtained from the Kentucky Climate Center. The average annual temperature for this region and period is 55.4° F. The average temperature in January is 34.9° F, and the average temperature in July is 75.2° F. The average annual rainfall for this area is 47.04 inches. The month of July typically has the most precipitation with an average of 4.86 inches.

5.2 BIOLOGICAL

5.2.1 PLANT AND ANIMAL COMMUNITIES

The Planning Area offers a diverse assortment of habitats for plant and animal communities. The valleys and hollows feature wetlands, fields, and forests. The mountains are covered primarily by dense forests, though reclaimed mountain-top removal sites often feature vast fields of variable slope. No adverse impact to plant and animal communities is anticipated due to the implementation of wastewater collection and treatment system improvements.

The Kentucky Department of Fish and Wildlife maintains a list of known animal species found in each county and their protection status. Table 5-1 shows animal species that are Threatened (T), Endangered (E), or of Special Concern (S) in Pike County.

SCIENTIFIC NAME	COMMON NAME	CLASS	KY STATUS
Accipiter striatus	Sharp-shinned Hawk	Aves	S
Actitis macularius	Spotted Sandpiper	Aves	E
Anas discors	Blue-winged Teal	Aves	T
Cambarus veteranus	Big Sandy Crayfish	Malacostraca	S
Cryptobranchus alleganiensis	Eastern Hellbender	Amphibia	S
Glyphyalinia rhoadsi	Sculpted Glyph	Gastropoda	T
Haliaeetus leucocephalus	Bald Eagle	Aves	T
Ichthyomyzon fossor	Northern Brook Lamprey	Cephalaspidomorphi	T
Lampetra appendix	American Brook Lamprey	Cephalaspidomorphi	T
Myotis leibii	Eastern Small-footed Myotis	Mammalia	T
Noturus stigmossus	Northern Madtom	Actinopterygii	S
Pandion haliaetus	Osprey	Aves	T
Patera panselenus	Virginia Bladetooth	Gastropoda	S
Percina macrocephala	Longhead Darter	Actinopterygii	E
Peucaea aestivalis	Bachman's Sparrow	Aves	E
Phalacrocorax auritus	Double-crested Cormorant	Aves	E
Plethodon wehrlei	Wehrle's Salamander	Amphibia	E
Pseudanophthalmus hypolithos	Ashcamp Cave Beetle	Insecta	T
Ursus americanus	American Black Bear	Mammalia	S
Vermivora chrysoptera	Golden-winged Warbler	Aves	T

Table 5-1: Pike County Animal Species Status

5.3 CULTURAL

There are no sites in the Planning Area listed on the National Register of Historic Places. A number of small cemeteries exist in the Planning Area and will be avoided by wastewater construction. The State Historic Preservation Officer will have an opportunity to comment to the clearinghouse. To our knowledge, the proposed project has no detrimental impact on historic properties. Most pipelines are planned to be constructed on previously disturbed lands or public road right of ways.

5.4 OTHER RESOURCE FEATURES

No national or state parks exist in the Planning Area, however there are three small community parks maintained by Pike County. Two of the parks, Long Fork and Robinson Creek, are located along existing sewer lines. Dorton Community Park is located near Dorton Hill in the southernmost part of the Planning Area. No significant farmland is anticipated to be disturbed by the installation of wastewater systems, and there are no USDA Designated Important Farmlands in the Planning

Area. There are no public drinking water intake points in the Planning Area. The nearest public drinking water intake point is several miles upstream from the Planning Area at Harless Creek, withdrawing water from the Russell Fork of the Big Sandy River.

SECTION 6 – EXISTING WASTEWATER SYSTEM

6.1 ON-SITE DISPOSAL

The majority of residents in the Lower Shelby Planning Area rely on septic fields and straight pipes for the disposal of sanitary wastewaters. There is no ready means of assessing the relative number of septic tank and straight pipe discharges in use by the residents of the Planning Area. Historically, straight pipe discharges have been a common occurrence in eastern Kentucky because the rugged topography confines most development to the relatively narrow floodplains immediately adjacent stream courses. **Exhibit 6-1** shows the existing KPDES permits in the Planning Area as made available on the Kentucky Division of Water's online database for existing NPDES (KPDES) discharge permits. A list of existing KPDES discharge permits in the Planning Area (excluding mining operations) is provided as Table 6-1 on the following page.

6.2 TREATMENT PLANT

6.2.1 DOUGLAS WASTEWATER TREATMENT PLANT

The Douglas Wastewater Treatment Plant was originally constructed to serve the Douglas Industrial Park and was originally permitted on April 28, 1978. It was later upgraded to serve the surrounding Shelby Valley area. The plant utilizes aeration basins for treatment. **Exhibit 6-2** shows the current schematic layout of the treatment plant.

The plant has a current design capacity of 200,000 GPD. A proposed 100,000 GPD upgrade will soon increase plant capacity to 300,000 GPD. Flow records from January 2011 to December 2011 obtained from Mountain Water District show an average flow of 51,718 GPD with a peak flow of 98,121 GPD. The plant is operating at approximately 26 percent current capacity when calculated using the aforementioned average daily flow. See Section 7, Table 7-1 for additional flow record information.

6.3 COLLECTION AND CONVEYANCE SYSTEM

6.3.1 COLLECTION LINES

According to the Mountain Water District, there are currently 726 total users on the existing collection system. The Douglas Industrial Park is served by 10-inch PVC gravity sewer lines. All other collection lines in the Planning Area are HDPE force mains. Three 6-inch force main lines feed into the plant. One 6-inch line extends to Little Creek where it transitions to a 4-inch line and continues along KY 122 to near Branham Heights. A second 6-inch line extends to a lift station located near Sugar Camp. The third 6-inch line extends to a lift station at Lick Fork near the intersection of U.S. 23 and Penny Road (KY 1469) then along Penny Road to a lift station near Virgie. Existing force mains are shown on **Exhibit 6-1**.

**Table 6-1
Other Existing KPDES Permits in Planning Area**

Facility Name	KPDES #	Facility Location	SIC Description
Dorton Recreational Park	KY0104841	Dorton	Amusement Parks
Potter Residence	KYG401248	Pikeville	Dwelling Operators, Except Apartments
Wright Residence	KYG401771	Pikeville	Dwelling Operators, Except Apartments
Roberts Residence	KYG401894	Pikeville	Dwelling Operators, Except Apartments
Caney Creek Freewill Baptist Church	KYR10E837	Virgie	Highway And Street Construction
Brown Residence	KYG401761	Virgie	Dwelling Operators, Except Apartments
Valley IGA	KY0077631	Virgie	Grocery Stores
Newsome Building	KY0101389	Pikeville	Apartment Building Operators
Tom Wright Residence	KYG400850	Pikeville	Dwelling Operators, Except Apartments
Virgie Happy Mart	KYG910069	Virgie	Gasoline Service Stations
David Newsome Residence	KYG401597	Pikeville	Dwelling Operators, Except Apartments
Osborne Residence	KYG402144	Pikeville	Dwelling Operators, Except Apartments
Tommy Hall Residence	KYG401812	Robinson Creek	Dwelling Operators, Except Apartments
Douglas Industrial Park	KY0042811	Robinson Creek	Sewerage Systems
Virgie Consolidation School	KYR10F783	Pikeville	Elementary And Secondary Schools
Martins MHP	KY0084212	Robinson Creek	Mobile Home Site Operators
David & Tiffany Damron Salyers Residence	KYG401674	Pikeville	Dwelling Operators, Except Apartments
Turpin Residence	KYG401544	Pikeville	Dwelling Operators, Except Apartments
Chapman Residence	KYG401823	Shelbiana	Dwelling Operators, Except Apartments
Reed Residence	KYG402130	Turkey Creek	Dwelling Operators, Except Apartments
Briggs Residence	KYG402131	Shelbiana	Dwelling Operators, Except Apartments
Ralph D Kilgore Residence	KYG400053	Pikeville	Dwelling Operators, Except Apartments
Hampton Residence	KYG401953	Robinson Creek	Dwelling Operators, Except Apartments
Branham Heights Treatment Plt	KY0096580	Pikeville	Subdividers And Developers
Mattingly Residence	KYG401079	Shelbiana	Dwelling Operators, Except Apartments
Keen Residence	KYG401935	Shelbiana	Dwelling Operators, Except Apartments
Ratliff Residence	KYG402061	Shelbiana	Dwelling Operators, Except Apartments
Brewer Residence	KYG401151	Shelbiana	Dwelling Operators, Except Apartments
Thacker Residence	KYG401075	Shelbiana	Dwelling Operators, Except Apartments
Thacker Residence	KYG401074	Shelbiana	Dwelling Operators, Except Apartments
Spears Trailer Park	KY0104361	Pikeville	Mobile Home Site Operators
Newsome Residence	KYG400988	Shelbiana	Dwelling Operators, Except Apartments
KTC Pike Co Maint Garage	KYG500121	Shelbiana	Bus Terminal And Service Facilities
Little Residence	KYG402080	Shelbiana	Dwelling Operators, Except Apartments
Scott Residence	KYG402112	Shelbiana	Dwelling Operators, Except Apartments
Shelby Office	KY0100323	Shelbiana	Nonresidential Building Operators
Coleman Oil Co	KYR000677	Shelbiana	Petroleum Bulk Stations & Terminals
Rose Residence	KYG401090	Pikeville	Dwelling Operators, Except Apartments
Shelbiana MHP	KY0099805	Shelbiana	Mobile Home Site Operators
Gregory Hackney Residence	KYG400538	Shelbiana	Dwelling Operators, Except Apartments
CSX Transportation Shelbiana	KY0000159	Shelbiana	Railroads, Line-Haul Operating
Harris Residence	KYG401863	Pikeville	Dwelling Operators, Except Apartments

6.3.2 PUMP STATIONS

Each user of the existing force main collection system is supplied with a residential grinder pump station. The Mountain Water District uses Gatorgrinder™ by Environment One Corporation (E-One). Each unit features a fiberglass tank, check valve, grinder pump, and controls. The grinder pumps have a one horsepower, 60 Hz, single phase motor running at 1,725 RPM with a pumping capacity of 11 GPM at 92' TDH. The fiberglass tanks are typically five feet in depth with a 30-inch diameter, and feature a four inch inlet and a 1.25-inch discharge. Virgie Middle School and George F. Johnson Elementary are equipped with quadplex grinder pump stations produced by E-One. These stations are of similar design, but feature larger fiberglass tanks and four grinder pumps

operating in parallel to produce flows up to 44 GPM. The Mountain Water District performs regular maintenance on all grinder pump units and keeps a supply of replacement pumps on-hand.

The force main collection system is currently supplemented by five lift stations. Table 6-2 contains a summary of lift station data. All stations are submersible wastewater pumping stations.

**Table 6-2
Summary of Existing Lift Stations**

I.D. #	Station Name	Station Location	Capacity (gpm)	TDH (ft)	HP	Force Main Dia.	Lid Elev.	Invert Elev.	Date Installed	Date Upgraded
1	Douglas WWTP	Influent Line of the Douglas WWTP	500	29	7.5	6	798.05'	775.22'		2005
2	Lick Branch	Intersection of U.S. 23 and KY 1469	302	176	40	6	793.00'	777.97'		
3	Penny Road	Intersection of KY 1469 and KY 610	218	54	7.5	6	836.00'	821.50'	2010	N/A
4	Robinson Creek	KY 122 Near Sugar Camp	178	57	10	6	796.23'	777.08'		
5	Collins	KY 122 Near Reconstructed U.S. 460	300	142	30	6	732.00'	718.00'	2009	N/A

(1) All Stations are Submersible Wastewater Pumping Stations

6.4 BIOSOLIDS DISPOSAL

The Douglas Wastewater Treatment Plant currently has no sludge handling capability. Sludge is liquid-hauled to the Pikeville WWTP to be pressed. A sludge press is proposed as part of the expansion to 0.3 MGD.

Occasional biosolids removal is required at localized package plants and residential septic systems. These biosolids are typically removed by third party sewage pumping companies in the liquid sludge form and disposed of at local wastewater treatment facilities for further treatment and final disposal.

6.5 OPERATION, MAINTENANCE, AND COMPLIANCE

According to the online EPA database for wastewater treatment facilities, the existing Douglas WWTP has not received a letter for notice of violation in the last five years.

An open records request was made to the DOW to verify the compliance history noted on the E.P.A. website for the Douglas WWTP as well as any compliance concerns for the existing wastewater collection system. It was discovered that the DOW has made a series of site visits since the plant upgrade in 2004.

Below is a summary of the compliance history for the Douglas WWTP and wastewater collection system since 2004:

1. June 10, 2005: A compliance evaluation was conducted by DOW. The facility was found to be in compliance and good working condition.
2. May 27, 2008: A routine inspection was conducted and observed no violations.

3. November 6, 2008: A routine inspection was conducted and found the clarifiers having a problem with pin floc that did not appear to affect the quality of the effluent. A DMR review found the plant to be out of compliance for Ammonia Nitrogen and E. Coli for the month of July 2008. No enforcement action was pursued as the problem seemed to have been resolved.
4. August 13, 2009: No violations observed during a routine inspection.
5. May 20, 2010: A compliance evaluation inspection was conducted and no issues were found with the operation of the facility. Aeration basins and clarifiers were reported to be in excellent condition and effluent was clear. A DMR review found the plant to be out of compliance for BOD in December and October of 2009. E. Coli was out of compliance in October and September of 2009. Ammonia Nitrogen was out of compliance in May 2009. No enforcement action was taken as excursions were minor and not part of a pattern.
6. February 24, 2011: A routine inspection was conducted and the plant was in compliance.
7. April 10, 2012: A routine inspection was conducted and the facility was found to be in excellent operating condition. No violations were observed.
8. July 10, 2012: A routine inspection was conducted and found several violations. The surge basin was found to have inadequate fall protection. The facility was found to not be properly measuring flow and the flow meter had not been calibrated within the last year.
9. December 4, 2012: A routine inspection was conducted and no violations were observed.

SECTION 7 – FORECASTS OF FLOWS AND WASTE LOADS IN THE PLANNING AREA

7.1 CURRENT AND PROJECTED RESIDENTIAL FLOWS**7.1.1 CURRENT**

Flow records for the Douglas Wastewater Treatment Plant for the year 2011 were obtained to determine the existing flows from the system. Table 7-1 is a statistical summary of the flow data presented by month.

**Table 7-1
Douglas WWTP Flow Records for 2011**

Month	Average Flow	Minimum Flow	Maximum Flow
January	50,847	30,335	67,665
February	50,811	29,620	73,180
March	59,400	26,000	96,670
April	62,153	25,553	86,530
May	39,608	17,585	62,700
June	41,801	25,000	54,208
July	42,413	22,900	70,555
August	60,777	31,700	98,121
September	54,970	33,521	86,000
October	60,683	37,418	88,890
November	53,736	38,155	78,555
December	43,418	23,085	62,650
Year 2011	51,718	17,585	98,121

According to the flow records, the average flow per household is 71.2 GPD with a maximum flow of 135.2 GPD. These flow rates are calculated by dividing the average and peak flows for the year by 726, the number of current users.

7.1.2 PROJECTED

Recalling from Section 4 that no change in population is expected or assumed, and using the equivalent populations established in Table 4-2, flows for each proposed service area can be projected. The average daily flow used for these projections is 100 GPD as established in *Ten States Standards – Recommended Standards for Wastewater Facilities (2004 Edition)*. Projections are presented in Table 7-2.

**Table 7-2
Planning Area Estimated Flows**

(A)	(B)	(C)	(D)	
Area #	Proposed Service Area	Population Equivalent (Note 1)	Avg. Daily Flow per Person (gpd) (Note 2)	Total Avg. Daily Flow per Area (gpd) (Note 3)
1	Douglas WWTP Expansion to 300,000 GPD	0	100	0
2	Buckfield	60	100	6,000
3	Branham Heights	96	100	9,600
4	Shelbiana	204	100	20,400
5	Little Creek	432	100	43,200
6	Robinson Creek	348	100	34,800
7	Sugar Camp	230	100	23,000
8	Little Robinson	617	100	61,700
9	Douglas WWTP Expansion to 500,000 GPD	0	100	0
10	Upgrade Existing Caney and Penny Road Line	0	100	0
11	Indian Creek - Section 1	178	100	17,800
12	Indian Creek - Section 2	278	100	27,800
13	Indian Creek - Section 3	276	100	27,600
14	Jonancy - Section 2	142	100	14,200
15	Long Fork - Section 2	408	100	40,800
16	Caney Creek - Section 1	286	100	28,600
17	Caney Creek - Section 2	163	100	16,300
18	Caney Creek - Section 3	348	100	34,800
	TOTAL =	4,066		406,600

1. Column B is determined by e911 data and aerial imagery
2. Ten States Standards
3. Column D calculated by multiplying column C with column B.

7.2 CURRENT AND PROJECTED COMMERCIAL AND INDUSTRIAL FLOWS

A search of KPDES permits in the Shelby Valley area revealed that the Planning Area has no significant existing industrial wastewater customers, nor are there any proposed industrial developments within the Planning Area. The following Table 7-3 represents the anticipated flows created by the existing industrial and commercial users within the Planning Area.

**Table 7-3
Summary of Flows from Current Large Flow Contributors (0-20 Year Period)**

Area #	Commercial and/or Industrial User	Population Equivalent	Avg. Daily Flow per Unit (gpd)	Avg. Daily Flow (gpd)			Total Avg. Daily Flow (gpd)
				0-2 Year	3-10 Year	11-10 Year	
3	Branham Heights	53	100	5,300	5,300	5,300	5,300
3	Spears Mobile Home Park	19	100	1,900	1,900	1,900	1,900
4	Shelbiana Mobile Home Park	41	100	4,100	4,100	4,100	4,100
6	Martins Mobile Home Park	62	100		6,200	6,200	6,200
16	Newsome Building (Apartments)	12	100			1,200	1,200
TOTAL =		187		11,300	17,500	18,700	18,700

1. There are currently no proposed large developments to occur during 0-20 year planning period.

These flows are incorporated in the projected flows from Table 7-2 as they are relatively low. Duplex or quadplex grinder pump stations are anticipated to be used in place of existing package treatment plants. Remaining non-residential customers in the Planning Area will be considered as residential for the purposes of this study as the flow from these generators is relatively small.

7.3 DOUGLAS WASTEWATER TREATMENT PLANT PROPOSED DESIGN CAPACITY

According to the Kentucky State Data Center at the University of Louisville, the population of Pike County shows negative growth between the two most recent decennial censuses. Due to the fluctuating nature of the natural resources industry, this facilities plan will assume no change in existing population over the next 20 years. Based on the flow data for existing users and the flow projections in Table 7-2, a recommended treatment plant capacity of 0.3 MGD is needed to handle flows generated during the 0-10 year planning period. An upgrade to 0.5 MGD is necessary before the additional service areas of Phase III (11-20 year) can be constructed.

7.4 WASTE LOAD ALLOCATION (WLA) FROM DOW

The effluent limits for an expanded wastewater treatment plant are presented in Table 7-4. The supporting waste load allocation letter from the Division of Water is presented in Appendix C.

**TABLE 7-4
EFFLUENT LIMITS**

Parameter	Limits for Existing Douglas WWTP	New WLA Limits for Future Plant	
		Initial Limits	Ultimate Limits
CBOD ₅	15 mg/l	15 mg/l	15 mg/l
TSS	15 mg/l	30 mg/l	30 mg/l
Summer NH ₃	4 mg/l	4 mg/l	4 mg/l
Winter NH ₃	10 mg/l	10 mg/l	10 mg/l
DO	7 mg/l	7 mg/l	7 mg/l

7.5 FORECASTS OF WASTE LOADS AND FLOWS

Table 7-5 presents the anticipated wastewater flows by service area and planning period. Ten State Standards for wastewater facilities suggests the following loading factors for normal strength domestic waste:

- 0.17 LB (0.08 kg) BOD₅/P.E./day
- 0.20 LB (0.09 kg) TSS/P.E./day
- 0.16 LB (0.07 kg) dried sludge production/P.E./day

Using a flow of 100 GPD per person the future (Year 2032) waste loading for the project may be forecasted as illustrated in Tables 7-6, 7-7, and 7-8. The waste load forecasts of planning periods 0-2, 3-10, and 11-20 are summarized in Table 7-9.

**Table 7-5
Anticipated Flows by Service Area and Planning Period**

Area #	Proposed Service Area	Population Equivalent	Avg. Daily Flow (gpd)			Total Avg. Daily Flow (gpd)
			0-2 Year (note 1)	3-10 Year (note 1)	11-20 Year (note 1)	
1	Douglas WWTP Expansion to 300,000 GPD	0	0			0
2	Buckfield	60	6,000			6,000
3	Branham Heights	96	9,600			9,600
4	Shelbiana	204	20,400			20,400
Phase I Total			36,000			
5	Little Creek	432		43,200		43,200
6	Robinson Creek	348		34,800		34,800
7	Sugar Camp	230		23,000		23,000
8	Little Robinson	617		61,700		61,700
Phase II Total			162,700			
9	Douglas WWTP Expansion to 500,000 GPD	0			0	0
10	Upgrade Existing Caney and Penny Road Line	0			0	0
11	Indian Creek - Section 1	178			17,800	17,800
12	Indian Creek - Section 2	278			27,800	27,800
13	Indian Creek - Section 3	276			27,600	27,600
14	Jonancy - Section 2	142			14,200	14,200
15	Long Fork - Section 2	408			40,800	40,800
16	Caney Creek - Section 1	286			28,600	28,600
17	Caney Creek - Section 2	163			16,300	16,300
18	Caney Creek - Section 3	348			34,800	34,800
Phase III Total			207,900			
CUMULATIVE TOTAL =		4,066	36,000	198,700	370,600	406,600

Notes:

1. Equals Equivalent Population * 100 gpd (Ten States Standards)

**TABLE 7-6
WASTE LOAD FORECAST (PHASE I, 0-2 Year)**

Contract (Phase) #	Proposed Service Area	Pop. Eqv.	Avg. Daily Flow per Person (gpd)	Total Avg. Daily Flow (gpd)	BOD		TSS		SOLIDS	
					lb/ day	mg/l	lb/ day	mg/l	lb/ day	mg/l
1	Douglas WWTP Expansion to 300,000 GPD	<i>* No New Flow Added With This Phase *</i>								
2	Buckfield	60	100	6,000	10	204	12	240	10	192
3	Branham Heights	96	100	9,600	16	204	19	240	15	192
4	Shelbiana	204	100	20,400	35	204	41	240	33	192
TOTAL =		360		36,000	61		72		58	

**TABLE 7-7
WASTE LOAD FORECAST (PHASE II, 3-10 Year)**

Contract (Phase) #	Proposed Service Area	Pop. Eqv.	Avg. Daily Flow per Person (gpd)	Total Avg. Daily Flow (gpd)	BOD		TSS		SOLIDS	
					lb/ day	mg/l	lb/ day	mg/l	lb/ day	mg/l
1	Little Creek	432	100	43,200	73	204	86	240	69	192
2	Robinson Creek	348	100	34,800	59	204	70	240	56	192
3	Sugar Camp	230	100	23,000	39	204	46	240	37	192
4	Little Robinson	617	100	61,700	105	204	123	240	99	192
	TOTAL =	1,627		162,700	277		325		260	

**TABLE 7-8
WASTE LOAD FORECAST (PHASE III, 11-20 Year)**

Contract (Phase) #	Proposed Service Area	Pop. Eqv.	Avg. Daily Flow per Person (gpd)	Total Avg. Daily Flow (gpd)	BOD		TSS		SOLIDS	
					lb/ day	mg/l	lb/ day	mg/l	lb/ day	mg/l
1	Douglas WWTP Expansion to 500,000 GPD	<i>* No New Flow Added With This Phase *</i>								
2	Upgrade Existing Caney and Penny Road Line	<i>* No New Flow Added With This Phase *</i>								
3	Indian Creek - Section 1	178	100	17,800	30	204	36	240	28	192
4	Indian Creek - Section 2	278	100	27,800	47	204	56	240	44	192
5	Indian Creek - Section 3	276	100	27,600	47	204	55	240	44	192
6	Jonancy - Section 2	142	100	14,200	24	204	28	240	23	192
7	Long Fork - Section 2	408	100	40,800	69	204	82	240	65	192
8	Caney Creek - Section 1	286	100	28,600	49	204	57	240	46	192
9	Caney Creek - Section 2	163	100	16,300	28	204	33	240	26	192
10	Caney Creek - Section 3	348	100	34,800	59	204	70	240	56	192
	TOTAL =	2,079		207,900	353		416		333	

**TABLE 7-9
WASTE LOAD FORECAST SUMMARY BY PLANNING PERIOD**

Planning Period	Users	Avg. Daily Flow per User (gpd)	Total Avg. Daily Flow (gpd)	BOD		TSS		SOLIDS	
				lb/ day	mg/1	lb/ day	mg/1	lb/ day	mg/1
I	360	100	36,000	61	204	72	240	58	192
II	1627	100	162,700	277	204	325	240	260	192
III	2079	100	207,900	353	204	416	240	333	192
TOTAL =	4,066		406,600	691		813		651	

SECTION 8A – EVALUATION OF COLLECTION AND CONVEYANCE ALTERNATIVES

8A.1 GENERAL

This section will evaluate alternatives for providing collection and conveyance of anticipated wastewater flows for the Planning Area.

8A.2 PROPOSED SERVICE AREAS

The wastewater collection, conveyance and treatment system for the study area is divided into fifteen (15) service areas as described in Section 3 herein (See **Exhibit 3-2** for a map showing project areas by planning period and **Exhibit 8A-1** depicting the extents of each service area). These service areas are as follows:

1. Buckfield
2. Branham Heights
3. Shelbiana
4. Little Creek
5. Robinson Creek
6. Sugar Camp
7. Little Robinson
8. Indian Creek – Section 1
9. Indian Creek – Section 2
10. Indian Creek – Section 3
11. Jonancy – Section 2
12. Long Fork – Section 2
13. Caney Creek – Section 1
14. Caney Creek – Section 2
15. Caney Creek – Section 3

8A.3 DESIGN ALTERNATIVES

There are two alternates for the collection of wastewater: (1) pressure sewers and (2) conventional gravity sewers. The following paragraphs highlight the advantages of each system.

8A.3.1 ALTERNATE 1 – PRESSURE SEWER SYSTEM

In a pressure sewer system each household, business, or institution is served by an individual grinder pump station. The individual pump stations are headered together on small diameter force mains that collect and convey the flow to centralized treatment. The individual customer on a pressure sewer system is responsible for the power service to the pump station and the utility is responsible for the maintenance and care of the pumping unit. A typical customer “Sewer User Agreement” is reproduced herein in Appendix E.

The primary design consideration for a force main sewer is the cleansing velocity. Ten States Standards requires a minimum cleansing velocity of two (2) feet per second. Extremely high velocities should also be avoided to minimize the forces acting on joints and fittings in the force main. The design flows for sizing the force mains are obtained from the daily sewer flow rates calculated previously.

Due to the terrain of the Planning Area and the location of the wastewater treatment facility, most of the project's pressure sewers will be conveying flow in a downhill direction from the tributary side hollows. Downhill pumping through significant changes in elevation creates line pressures too great to be overcome by individual residential pumping units. Consequently, the pressurized sewage flows must be returned to atmospheric pressure at selected locations. This creates a demand for mainline pump stations to break pressure and then re-pressurize the flow on its way to the plant.

Additionally, some of the Planning Area is located downstream from the existing WWTP. Mainline lift stations will be constructed at required locations to "lift" the wastewater as needed to pump the flows upstream (uphill) to the plant.

A preliminary layout of the proposed sewer collection system is presented in **Exhibit 8A-1**.

8A.3.2 ALTERNATE 2 – CONVENTIONAL GRAVITY SEWER

A conventional gravity sewer consists of a series of manholes connected by pipes to transport wastewater by gravity to the treatment facility. The pipe must be laid 'gun barrel straight' manhole to manhole on a uniform down gradient to insure positive flow. Ten States Standards mandates minimum slopes for each diameter of pipe to minimize solids deposition. These sewers, by nature of their design, are constructed to follow the natural drainage of a watershed.

Unfortunately, site topography and development does not always allow sewers to follow stream courses. Further, since the lines must flow by gravity, they cannot be diverted around major obstacles, such as intersecting storm drains and culverts. Therefore, pump stations and force mains are still a necessary part of conventional gravity sewer construction. However, the pump stations are mainline stations owned, operated, and maintained solely by the utility. Additionally, the "gun barrel" straight construction of a gravity sewer system typically requires procurement of right of way from private concerns, which may add substantially to the cost of the project.

The topographical layout of the Planning Area contains many obstacles for gravity sewers such as streams that cannot be crossed without the aid of a lift station. These streams divide many of the service areas into two parts. In these areas the use of lift stations with a gravity sewer extension or residential grinder pumps with force mains will be utilized to serve the customers on the opposing side of the stream.

The Planning Area is planned such that a portion of the wastewater flows from down river from the WWTP would be collected by gravity sewers flowing away from the plant, and then be pumped back through a parallel force main to the plant. The portion of the Planning Area up river from the plant would be collected by gravity sewers that flow toward the plant. All sewers would likely be collected by one mainline, plant influent pumping station and pumped across river to the new plant.

A preliminary layout of the proposed sewer collection system is presented in **Exhibit 8A-1**. However, the exact location of proposed lift stations for the gravity sewer alternate will vary slightly from those depicted in **Exhibit 8A-1**. See Section 8A.4 for more information regarding proposed lift stations.

8A.4 SERVICE AREA COLLECTION AND CONVEYANCE SYSTEMS

Alternates for pressure and gravity sewer systems were prepared for each of the fifteen (15) service areas. Each service area was considered to be an individual phase, or contract of

construction. A detailed opinion of probable construction cost for each contract is provided as Tables 1-30 in Appendix D along with the corresponding project exhibit for the selected plan for each contract.

The following Table 8A-1 summarizes the proposed lift stations required for Alternate 1 - Pressure Sewer System.

Table 8A-1
Summary of Proposed Pressure Sewer Alternate Lift Stations

#	Area #	Proposed Service Area	Lift Station Proposed Location Description	Capacity (GPM)	EST. HP
1	3	Shelbiana	Near Existing Branham Heights Package Treatment Plant	100	11
2	6	Robinson Creek	KY 122 Near Sugar Camp (Upgrade)	300	33
3	8	Little Robinson	Intersection of KY 122 at Little Robinson Creek	250	28
4	10	Lick Creek	Intersection of US 23 and Penny Road (KY 1469) (Upgrade)	1000	109
5	10	Virgie	Intersection of Penny Road and KY 610 (Upgrade)	750	82
6	11	Indian Creek	Intersection of KY 122 (Indian Creek) and KY 610	250	28
7	15	Long Fork	Near Existing G.F. Johnson Elementary School	150	17
8	17	Caney Creek	US 23 Near Booker Fork	200	22
TOTAL ESTIMATED HP =					330

The following Table 8A-2 summarizes the proposed lift stations required for Alternate 2 - Gravity Sewer System.

**Table 8A-2
Summary of Proposed Gravity Sewer Alternate Lift Stations**

#	Area #	Proposed Service Area	Lift Station Location Description	Capacity (GPM)	EST. HP
1	3	Shelbiana	End of Existing Force Main	150	17
2	5	Little Creek	Intersection of Little Creek and KY 122	400	44
3	6	Robinson Creek	KY 122 Near Sugar Camp (Upgrade)	400	44
4	10	Lick Creek	Intersection of US 23 and Penny Road (KY 1469) (Upgrade)	1000	109
5	10	Virgie	Intersection of Penny Road and KY 610 (Upgrade)	750	82
6	11	Indian Creek	Intersection of KY 122 (Indian Creek) and KY 610	250	28
7	14	Jonancy	KY 610 Near Elswick Branch	100	11
8	15	Long Fork	Near Existing G.F. Johnson Elementary School	150	17
TOTAL ESTIMATED HP =					352

8A.5 SELECTION OF ALTERNATE

Alternates 1 and 2 are compared on a present worth basis in Table 8A-5 at the end of this section. The present worth analysis assumes:

1. The life of the system is twenty (20) years.
2. An interest rate of seven (7) percent.
3. An inflation rate of zero (0).
4. A salvage value of zero (0).

The pressure sewer alternate was found to be the most economical approach. Table 8A-4, located at the end of this section, summarizes the estimated project costs for each alternate by contract and planning period. Table 8A-5 shows the present worth analysis for each collection system alternate by planning period.

The cost opinions of Tables 1-15 of Appendix D contain the pressure sewer alternative and the Tables 16-30 contain cost opinions for the gravity sewer alternative. Operations and maintenance costs for both alternatives 1 and 2 were derived in Tables 31-36 of Appendix D.

Exhibit 8A-1 presents a conceptual layout of the proposed sewer system.

8A.6 NON-MONETARY FACTORS

Non-monetary factors are those, which are more subjective in nature and cannot easily have a dollar value assigned to them. The non-monetary factors evaluated for this study are:

1. Ease of construction- the pressure sewer system is simpler to construct because it can be constructed like a water line, with no need to be concerned with maintaining set grades. A pressure sewer has smaller line diameters, is buried at shallower depths than a gravity system, and is frequently installed by trenchless techniques. Consequently, pressure sewer construction is far less disruptive to existing developed areas and has less environmental impact.

2. Ease of operation- the gravity sewer system is simpler to operate because it has fewer pumps to maintain.

3. Adaptability - the pressure sewer system is more readily adaptable to rugged terrain as it is not constrained by a minimum slope, and can force wastewater up slopes as necessary.

4. Right of way – The right of way taking for pressure sewers is significantly less than for gravity sewers.

5. Reserve Capacity (Expansion) – It is easier to provide reserve capacity in gravity sewers.

Table 8A-3 summarizes the above criteria and gives each a score of + or -. A “positive” score indicates a favorable rating and a “negative” indicates an unfavorable rating. The alternate with the most favorable rating is the preferred.

TABLE 8A-3
Non-Monetary Factor Rating

FACTOR	PRESSURE SYSTEM	GRAVITY SYSTEM
Ease of Construction	+	-
Ease of Operation	-	+
Adaptability	+	-
Right of Way	+	-
Reserve Capacity	-	+
SCORE	3	2

The pressure sewer alternate is the preferred collection system alternate both from a present worth analysis and from a non-monetary analysis. See Table 8A-4 for a summary of collection system costs by alternate and planning period. See Table 8A-5 for a present worth analysis of the collection system by planning period.

**TABLE 8A-4
SUMMARY OF ESTIMATED SEWER CONSTRUCTION COSTS BY ALTERNATE**

AREA #	SERVICE AREA	PROJECT PLANNING PERIOD																		
		0-2 YEAR PERIOD		3-10 YEAR PERIOD		11-20 YEAR PERIOD		ALT #1		ALT #2										
		ALT #1 PRESSURE	ALT #2 GRAVITY	ALT #1 PRESSURE	ALT #2 GRAVITY	ALT #1 PRESSURE	ALT #2 GRAVITY	ALT #1 PRESSURE	ALT #2 GRAVITY	ALT #1 PRESSURE	ALT #2 GRAVITY									
1	Douglas WWTP Expansion to 300,000 GPD	N/A	N/A																	
2	Buckfield	\$ 306,740.00	\$ 471,303.00																	
3	Branham Heights	\$ 529,874.00	\$ 696,033.00																	
4	Shelbiana			\$ 958,040.00	\$ 1,460,432.00															
5	Little Creek			\$ 2,233,875.00	\$ 4,070,509.00															
6	Robinson Creek			\$ 1,715,146.00	\$ 2,576,108.00															
7	Sugar Camp			\$ 1,112,972.00	\$ 1,704,007.00															
8	Little Robinson			\$ 3,343,396.00	\$ 4,658,304.00															
9	Douglas WWTP Expansion to 500,000 GPD																			
10	Upgrade Existing Caney and Penny Road Line																			
11	Indian Creek - Section 1																			
12	Indian Creek - Section 2																			
13	Indian Creek - Section 3																			
14	Jonancy - Section 2																			
15	Long Fork - Section 2																			
16	Caney Creek - Section 1																			
17	Caney Creek - Section 2																			
18	Caney Creek - Section 3																			
	SUB-TOTAL CONSTRUCTION	\$ 836,614.00	\$ 1,167,336.00	\$ 9,363,429.00	\$ 14,469,360.00	\$ 13,201,513.00	\$ 19,806,512.00													
	COST BY PHASE																			
	Construction Contingency @ 15%	\$ 125,492.10	\$ 175,100.40	\$ 1,404,514.35	\$ 2,170,404.00	\$ 1,980,226.95	\$ 2,970,976.80													
	Right of Way, Engineering Design, Inspection, Bond Council, Additional Engineering and Legal (@ 35% (Note 1))	\$ 292,814.90	\$ 525,301.20	\$ 3,277,200.15	\$ 6,511,212.00	\$ 4,620,529.55	\$ 8,912,930.40													
	PROJECT COST BY PHASE	\$ 1,254,921.00	\$ 1,867,737.60	\$ 14,045,143.50	\$ 23,150,976.00	\$ 19,802,269.50	\$ 31,690,419.20													
	TOTAL PROJECT COST (PRESSURE) =	\$ 35,102,334.00																		
	TOTAL PROJECT COST (GRAVITY) =	\$ 56,709,132.80																		

1. Gravity Sewers Assume an Additional 10% for Right of Way Acquisition Costs

TABLE 8A-5
PRESENT WORTH ANALYSIS

SERVICE AREA	PROJECT YEAR									
	0-2 YEAR PERIOD		3-10 YEAR PERIOD		11-20 YEAR PERIOD		11-20 YEAR PERIOD		11-20 YEAR PERIOD	
	ALT #1 PRESSURE	ALT #2 GRAVITY								
1. CONSTRUCTION COST BY PHASE	\$ 836,614.00	\$ 1,167,336.00	\$ 9,363,429.00	\$ 14,469,360.00	\$ 13,204,513.00	\$ 19,806,512.00				
2. Construction Contingency @ 15%	\$ 125,492.10	\$ 175,100.40	\$ 1,404,514.35	\$ 2,170,404.00	\$ 1,980,226.95	\$ 2,970,976.80				
3. Right of Way, Engineering Design, Inspection, Bond Council, and Legal @ 35% (Note 4)	\$ 292,814.90	\$ 525,301.20	\$ 3,277,200.15	\$ 6,511,212.00	\$ 4,620,529.55	\$ 8,912,930.40				
4. PROJECT COST BY PHASE	\$ 1,254,921.00	\$ 1,867,737.60	\$ 14,045,143.50	\$ 23,150,976.00	\$ 19,802,269.50	\$ 31,690,419.20				
5. Present Worth Factor (Int = 7%, t = 10 Yrs)			0.5083	0.5083						
6. Present Worth Factor (Int = 7%, t = 20 Yrs)					0.2584	0.2584				
7. PRESENT WORTH PROJECT COST	\$ 1,254,921.00	\$ 1,867,737.60	\$ 7,139,146.44	\$ 11,767,641.10	\$ 5,116,906.44	\$ 8,188,804.32				
8. OPERATIONS & MAINTENANCE (See Note 1)	\$127,094	\$118,294	\$50,899	\$50,083	\$94,298	\$118,537				
9. Equal Series Present Worth Factor (Int = 7%, t = 20 Yrs)	10.594	10.594								
10. Equal Series Present Worth Factor (Int = 7%, t = 10 Yrs)			7.0236	7.0236						
11. Present Worth Factor (Int = 7%, t = 10 Yrs)			0.5083	0.5083						
12. Present Worth Factor (Int = 7%, t = 20 Yrs)					0.2584	0.2584				
13. PRESENT WORTH O&M	\$ 1,346,437.65	\$ 1,253,209.80	\$ 181,715.27	\$ 178,800.19	\$ 24,366.50	\$ 30,629.95				
14. SALVAGE (See Note 3)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
15. PRESENT WORTH SALVAGE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
GRAND TOTAL PRESENT WORTH OF ALTERNATE (See Note 2)	\$ 2,601,358.65	\$ 3,120,947.40	\$ 7,320,861.71	\$ 11,946,441.29	\$ 5,141,272.94	\$ 8,219,434.27				
TOTAL PRESENT WORTH (PRESSURE) =	\$ 15,063,493.30									
TOTAL PRESENT WORTH (GRAVITY) =	\$ 23,286,822.96									

Notes

1. For derivation of O&M costs, see Appendix D Tables 31-36.
2. Sum of row 7, row 11 and row 13
3. Salvage value is assumed to be zero
4. Gravity sewer will require additional 10% of construction cost for R/W acquisition.

SECTION 8B – WASTEWATER TREATMENT ALTERNATIVES

8B.1 GENERAL

This section presents alternatives for treatment of the anticipated wastewater flows and loads. Alternatives will be identified and evaluated on a present worth basis (including capital and O & M costs), as well as on a non-monetary basis.

8B.2 TREATMENT OPTIONS

Three treatment options were evaluated. These were:

1. Do nothing
2. Expand existing plant
3. Build a new plant at existing site

The options are described in sections 8B.2.1, 8B.2.2, and 8B.2.3 respectively.

8B.2.1 OPTION 1 – DO NOTHING

The do nothing option preserves the status quo and provides no improvements to wastewater treatment systems. Wastewater generated by most of the residents will either be treated with private septic systems or ‘straight piped’ directly to local streams and watercourses. Larger commercial/business enterprises will continue to rely on private package treatment plants which tend to be poorly operated and maintained. This option will do nothing to improve local water quality or public health and will likely result in a gradual deterioration of surface water quality. This option is contrary to the public good and will not be considered.

8B.2.2 OPTION 2 – EXPAND EXISTING PLANT

This option would endeavor to expand the existing plant facilities. Expansion would be accomplished by adding new extended aeration basins or by retrofitting existing basins with new technology such as a membrane bioreactor (MBR). However, maintaining redundancy requirements of DOW during expansion may prove difficult or even impossible. Additional parallel units are mandated by DOW redundancy requirements so that the plant is capable of turning off one set of primary units while doing repairs or expanding the plant and still be able to handle the peak flow from the system.

The existing site is located at Douglas Park near Shelby Creek of the Levisa Fork of the Big Sandy River and is geographically constrained. The site is out of the flood plain and away from railroad right-of-way, but land constraints such as property lines and steep hillsides constrict the usable area for expansion on the existing site. See **Exhibit 8B-1** for a map depicting the site and its constraints.

8B.2.3 OPTION 3 – BUILD NEW PLANT AT EXISTING SITE

This option would utilize available property on the existing plant site to construct a new membrane bioreactor (MBR) plant. MBR plants generally have a smaller footprint than conventional

treatment plant designs. The existing extended aeration basins would remain in operation until the new plant is complete.

8B.3 WASTEWATER TREATMENT TECHNOLOGIES

Two wastewater treatment technologies were evaluated for the plant upgrade. These were:

1. Phased construction of additional extended aeration (EA) basins.
2. Phased construction membrane bioreactors (MBR).

The following paragraphs discuss each alternate. Please note since a 0.5 MGD plant is not needed until Planning Area build out, planning will be for an initial 0.4 MGD plant which will be adequate well into project year 11.

8B.3.1 TECHNOLOGY 1 – PHASED CONSTRUCTION OF ADDITIONAL EA BASINS

This technology is currently being used at the Douglas Wastewater Treatment Plant. There are currently two extended aeration basins capable of treating an average daily flow of 0.1 MGD each for a combined total of 0.2 MGD. To expand plant capacity, additional 0.1 MGD EA basins would be constructed during each phase.

The first phase proposes several additional improvements to enhance plant performance. The following upgrades are proposed:

1. Replace the failing rotating cloth filters with a Pyradek filter system.
2. Upgrade plant headworks, including the addition of a fine screen.
3. Add a sludge press to eliminate the need to haul liquid sludge to another plant.

8B.3.2 TECHNOLOGY 2 – PHASED CONSTRUCTION OF MBR

This technology permits a greater design flow per amount of space needed. Membrane bioreactors are submerged in a tank above air diffusers. The MBR units provide filtration after biological degradation by microbes. The air diffusers scour the membrane surfaces, provide oxygen for the biological process, and mix the tank.

There are two options for converting treatment processes to MBR technology. They are as follows:

1. The MBR can be installed in the existing tankage. The existing EA basins would be rehabilitated and then retrofitted with the MBR components.
2. A new basin can be constructed on-site. This basin would be capable of treating up to 0.4 MGD and would fit the available land. Considering the condition of the existing tankage and the difficulties of retrofitting an active plant, this option will be used in the analysis in Section 8B.4 below.

Both options require an extensive upgrade to the plant headworks to provide redundant screening. MBR plants are sensitive to and easily fouled by suspended matter. Screening is a critical step in the process and cannot be bypassed.

8B.4 SELECTION OF WASTEWATER TREATMENT TECHNOLOGY

The selection of the preferred technology will be chosen after a comparison of Technologies 1 and 2. The criteria for the final selection of the preferred technologies are as follows:

1. Initial construction cost.
2. Present worth analysis, including operating and maintenance and salvage values.
3. Non-monetary factors.

The following paragraphs will address each of the selection criteria as they pertain to Technologies 1 and 2.

8B.4.1 INITIAL CONSTRUCTION COST COMPARISON

The estimated initial capital costs of Technologies 1 and 2 are compared in Table 8B-1.

**TABLE 8B-1
COMPARISON OF CAPITAL (PROJECT) COSTS OF ALTERNATES 1 AND 2**

PLANNING PERIOD	Technology 1 – Extended Aeration	Technology 2 – Membrane Bioreactor
0-2 Year Period	\$2,580,000	\$2,800,000
3-10 Year Period	\$1,400,000	\$500,000
11-20 Year Period (Note 1)	N/A	N/A
TOTAL =	\$3,980,000	\$3,300,000

Notes:

1. It is unrealistic to project the cost of treatment expansion this far in the future due to rising costs of construction for plants of this nature.

8B.4.2 PRESENT WORTH ANALYSIS

The present worth analysis is frequently referred to as a life cycle cost analysis. The objective of this analysis is to identify the treatment technology with the least cost to the owner over its operating life. Frequently, systems with low capital costs have high operations costs and are not a bargain to the owner.

The present worth computations are presented in Table 8B-3. The present worth computations rely on the following assumptions:

1. The alternates shall be compared over a twenty-year life.
2. The time value of money (interest rate) is 7%.

3. Inflation may be neglected.
4. Salvage values are zero for the existing plant components.
5. Sludge handling will be a regular expenditure for Technologies 1 and 2.

8B.4.3 NON-MONETARY FACTORS

Non-monetary factors are those elements of the treatment process, which cannot be readily quantified, but rather are subjective in nature. The non-monetary factors considered in this study are:

Reliability/Upset Potential – Extended aeration is the more proven technology. Screening is a critical component for MBR plants and any screening failure can cause plant upset.

Simplicity – MBR plants generally require less piping and fewer components than extended aeration. However, EA treatment processes are mechanically simpler.

Familiarity – Operators are already familiar with EA technology since it is currently in use at the plant. There are no MBR wastewater treatment plants in Kentucky at the time of this report.

Flexibility – Both technologies are considered comparable.

Expandability – A 0.4 MGD MBR basin can be constructed with an initial capacity of 0.3 MGD. Expanding to 0.4 MGD would only require installing an additional MBR module. Expanding an EA plant requires the construction of a new EA basin.

Odor production – The plant currently has an odor issue. It is not known whether MBR technology would correct this. Therefore, both technologies are considered comparable.

Land Requirements – MBR plants treat more wastewater per tank area than extended aeration, thus requiring significantly less land.

Table 8B-2 compares the non-monetary factors for both technologies. A “positive” sign indicates a favorable rating for the technology option, while a “negative” sign indicates an unfavorable rating for that technology.

Table 8B-2
Comparison of Non-Monetary Factors for Alternates 1 and 2

Non-Monetary Factor	Technology	
	Technology 1 – Extended Aeration (EA)	Technology 2 – Membrane Bioreactor (MBR)
Reliability	+	-
Simplicity	+	+
Familiarity	+	-
Flexibility	+	+
Expandability	-	+
Odor Production	-	-
Land Requirement	-	+
TOTAL =	4	4

TABLE 8B-3
PRESENT WORTH ANALYSIS OF PHASE 1 TREATMENT TECHNOLOGIES

ITEM	COST	FACTOR (P/A, 20 YEARS)	PRESENT WORTH
Technology 1 – Extended Aeration (EA)			
1. Capital Cost Phase I	\$ 2,580,000.00	1.00	\$2,580,000.00
2. Plant O&M (0-2 Year Period)	\$254,301	10.5940	\$2,694,069.09
3. Present Worth - Technology 1			\$5,274,069.09
Technology 2 – Membrane Bioreactor (MBR)			
1. Capital Cost Phase I	\$ 2,800,000.00	1.00	\$2,800,000.00
2. Plant O&M (0-2 Year Period)	\$166,754	10.5940	\$1,766,588.86
3. Present Worth - Technology 2			\$4,566,588.86

SECTION 8C – SELECTED ALTERNATE

8C.1 GENERAL

This section will describe the recommended plan, discuss options for project financing, identify the financial burden imposed on system customers, and outline a plan for implementing the selected alternates.

8C.2 DESCRIPTION OF RECOMMENDED PLAN

Per the analyses presented in Section 8A for collector sewers and in Section 8B for treatment, the recommended plan for the collection, conveyance, and treatment of wastewater in the Planning Area is a phased extension of a pressure sewer system and construction of a new MBR type wastewater treatment plant on the available land at the existing site. The following paragraphs describe in more detail the proposed phasing and implementation of the recommended plan. See Appendix D for cost opinions and Exhibits for the selected plan. See Table 8A-1 for a summary of the proposed lift stations for the selected plan.

8C.2.1 0-2 YEAR PLANNING PERIOD PROJECTS

The 0-2 year planning period is comprised of four (4) contracts. All flows will be treated at the existing Douglas WWTP. The ultimate flow contribution from the 0-2 year planning period projects is projected to be 36,000 GPD. An overview of the 0-2 year planning period projects is depicted in **Exhibit 8C-1**. The contracts are as follows:

Contract 1 – Douglas WWTP Expansion to 300,000 GPD: This contract consists of constructing a new 0.4 MGD MBR basin at the existing site. The new basin will have an initial capacity of 0.3 MGD with space to add a 0.1 MGD MBR module in the future. This contract also includes various other upgrades to the plant such as a fine screen and a sludge press.

Contract 2 – Buckfield: This contract consists of the construction of a 4-inch and 3-inch force main in the Buckfield area. The extension will provide sanitary sewer service to an existing equivalent population of 60 previously unsewered customers (6,000 GPD). See Table 1 and Area 2 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 3 – Branham Heights: This contract consists of the construction of a 4-inch force main to and around the Branham Heights subdivision. The extension will provide sanitary sewer service to an existing equivalent population of 96 customers (9,600 GPD). The 53 customers in Branham Heights and the 19 in Spears Mobile Home Park are currently served by package treatment plants which will be replaced by pump stations. See Table 2 and Area 3 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 4 – Shelbiana: This contract consists of the construction of a 4-inch and 3-inch force main to the Shelbiana area. The extension will provide sanitary sewer service to an existing equivalent population of 204 previously unsewered customers (20,400 GPD). The 41 customers in the Shelbiana Mobile Home Park are currently served by a package treatment plant which will be replaced by a pump station. See Table 3 and Area 4 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

8C.2.2 3-10 YEAR PLANNING PERIOD PROJECTS

The 3-10 year planning period is comprised of four (4) contracts. The sewer user base consists of primarily residential and small business users. The ultimate flow contribution from the 3-10 year planning period projects is projected to be 162,700 GPD. An overview of the 3-10 year planning period projects is depicted in **Exhibit 8C-2**. The contracts are as follows:

Contract 5 – Little Creek: This contract consists of the construction of a 4-inch and 3-inch force main along Little Creek. The extension will provide sanitary sewer service to an existing equivalent population of 432 previously unsewered customers (43,200 GPD). See Table 4 and Area 5 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 6 – Robinson Creek: This contract consists of the construction of a 6-inch force main along KY 122 with a 3-inch force main sideline to Bear Fork. The extension will provide sanitary sewer service to an existing equivalent population of 348 previously unsewered customers (34,800 GPD). The 62 customers in Martins Mobile Home Park are currently served by a package treatment plant which will be replaced by a pump station. The existing Robinson Creek lift station would be upgraded. See Table 5 and Area 6 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 7 – Sugar Camp: This contract consists of the construction of a 4-inch and 3-inch force main along Sugar Camp Branch. The extension will provide sanitary sewer service to an existing equivalent population of 230 previously unsewered customers (23,000 GPD). See Table 6 and Area 7 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 8 – Little Robinson: This contract consists of the construction of a 6-inch, 4-inch, and 3-inch force main along Little Robinson Creek. The extension will provide sanitary sewer service to an existing equivalent population of 617 previously unsewered customers (61,700 GPD). This contract includes a new lift station near the intersection of Little Robinson Creek Road and KY 122. See Table 7 and Area 8 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

8C.2.3 11-20 YEAR PLANNING PERIOD PROJECTS

The 11-20 year planning period is comprised of ten (10) contracts. The sewer user base consists of primarily residential and small business users. The ultimate flow contribution from the 11-20 year planning period projects is projected to be 207,900 GPD. An overview of the 11-20 year planning period projects is depicted in **Exhibit 8C-3**. The contracts are as follows:

Contract 9 – Douglas WWTP Expansion to 500,000 GPD: This contract consists of the expansion of the Douglas WWTP from 0.3 MGD to its ultimate capacity of 0.5 MGD.

Contract 10 – Upgrade Existing Caney and Penny Road Line: This contract consists of the construction of 6-inch force main along U.S. 23 and Penny Road to replace the existing undersized 6-inch force main. The lift stations at Lick Branch and Virgie will also be upgraded. No additional customers are to be added in this contract. See Table 8 and Area 10 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 11 – Indian Creek Section 1: This contract consists of the construction of a 6-inch force main along Indian Creek with several 3-inch sidelines. The extension will provide sanitary sewer service to an existing equivalent population of 178 previously unsewered customers (17,800

GPD). This contract includes a new lift station near the intersection of KY 122 and KY 610. See Table 9 and Area 11 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 12 – Indian Creek Section 2: This contract consists of the construction of a 6-inch force main along Indian Creek Road. The extension will provide sanitary sewer service to an existing equivalent population of 278 previously unsewered customers (27,800 GPD). See Table 10 and Area 12 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 13 – Indian Creek Section 3: This contract consists of the construction of a 4-inch force main along Indian Creek Road with several 3-inch sidelines. The extension will provide sanitary sewer service to an existing equivalent population of 276 previously unsewered customers (27,600 GPD). See Table 11 and Area 13 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 14 – Jonancy Section 2: This contract consists of the construction of a 3-inch force main along KY 610 to additional houses in the Jonancy Area. The extension will provide sanitary sewer service to an existing equivalent population of 142 previously unsewered customers (14,200 GPD). See Table 12 and Area 14 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 15 – Long Fork Section 2: This contract consists of the construction of 4-inch and 3-inch force main along Long Fork Road from G.F. Johnson Elementary School to Marshalls Branch. The extension will provide sanitary sewer service to an existing equivalent population of 408 previously unsewered customers (40,800 GPD). This contract includes a new lift station near G.F. Johnson Elementary School. See Table 13 and Area 15 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 16 – Caney Creek Section 1: This contract consists of the construction of a 6-inch force main along U.S. 23 from the Lick Creek lift station to Booker Fork with several 3-inch sidelines. The extension will provide sanitary sewer service to an existing equivalent population of 286 previously unsewered customers (28,600 GPD). See Table 14 and Area 16 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 17 – Caney Creek Section 2: This contract consists of the construction of a 6-inch force main along U.S. 23 from Booker Fork to the intersection of U.S. 23 and KY 611. The extension will provide sanitary sewer service to an existing equivalent population of 163 previously unsewered customers (16,300 GPD). This contract includes a new lift station near Booker Fork. See Table 15 and Area 17 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

Contract 18 – Caney Creek Section 3: This contract consists of the construction of 4-inch and 3-inch force main along KY 611. The extension will provide sanitary sewer service to an existing equivalent population of 348 previously unsewered customers (34,800 GPD). See Table 16 and Area 18 Exhibit in Appendix D for the opinion of probable construction cost and project exhibit.

8C.3 FINANCIAL REQUIREMENTS

Project Cost

The capital requirements and phasing of the selected plan 0-2 Year are summarized in Table 8C-1. The estimated project costs for the 0-2 year collection system and treatment works are \$2,691,981.00 and \$2,800,000.00 respectively for a 0-2 year project total of \$5,491,981.00.

Funding Plan

See Section 10, Table 10-1.

Operation and Maintenance Costs

Table 8C-2 summarizes the estimated operation and maintenance costs for the selected conveyance and treatment alternates.

Proposed Sewer Rates

Table 8C-3 summarizes the estimated annual operation and maintenance costs as well as the anticipated debt service payback requirements based on the proposed funding plan (See Section 10). Based on the total projected annual expenses the minimum recommended charge per 1,000 gallons of wastewater generated was determined and average monthly bills estimated for the new sewer customers.

Sewer Revenues and Operations Budget

Table 8C-4 summarizes the estimated sewer revenues to be generated by the selected plan based on the recommended sewer rate per 1,000 gallons of wastewater calculated in Table 8C-3. It is assumed that 100% signups (sewer hookups) will not be received when the contracts are constructed. Therefore, project sewer revenues were determined based on 75% signups (75% of total projected flows) to produce a more conservative estimation of sewer revenues.

Based on proposed sewer rates, the 0-2 year period projects are anticipated to generate a total revenue of \$421,833.36. Based on total projected annual O&M and debt service costs and the 0-2 year revenues, the Mountain Water District would operate with a debt service pay back ratio of 1.2 in the initial project years.

Table 8C-1
Summary of Estimated Project Costs for Selected Plan (0-10 Year)

AREA #	PRESSURE SEWER SYSTEMS		
	SERVICE AREA	PHASE	
		0-2 YEAR	3-10 YEAR
1	Douglas WWTP Expansion to 300,000 GPD	See Plant Estimate	
2	Buckfield	\$ 306,740.00	
3	Branham Heights	\$ 529,874.00	
4	Shelbiana	\$ 958,040.00	
5	Little Creek		\$ 2,233,875.00
6	Robinson Creek		\$ 1,715,146.00
7	Sugar Camp		\$ 1,112,972.00
8	Little Robinson		\$ 3,343,396.00
	SUBTOTAL CONSTRUCTION	\$ 1,794,654.00	\$ 8,405,389.00
	SUBTOTAL PROJECT COST	\$ 2,691,981.00	\$ 12,608,083.50
	TREATMENT ALTERNATE		
	New MBR at Existing Site		
	SUB-TOTAL PROJECT COST	\$2,800,000	\$500,000
	GRAND TOTAL - CAPITAL REQ'D	\$ 5,491,981.00	\$ 13,108,083.50

Notes:

1. Project costs include 15% contingency for construction and 35% for legal, right of way and engineering. For additional information refer to Tables 8A-4 and 8A-5.

Table 8C-2

Summary of O&M Costs for Selected Plan (0-10 Year)

PRESSURE SEWER SYSTEM	
Planning Period	O&M Cost
0-2 Year	\$127,094
3-10 Year	\$50,899
Total =	\$177,994
NEW MBR AT EXISTING SITE	
Planning Period	O&M Cost
0-2 Year	\$166,754
3-10 Year	Assume No Change
Total =	\$166,754
PROBABLE O&M COST =	\$344,747

**Table 8C-3
Estimated Operating Budget for 0-2 Year Period**

OPERATING EXPENSES					
0-2 Year Collection System O&M	-	\$	127,094.36		
0-2 Year Treatment O & M	-	\$	166,753.72		
Net O&M =	-	\$	293,848.08		
DEBT REPAYMENT					
<i>* See Table 10-1 for Full Funding Plan *</i>					
LOAN DESCRIPTION	AMOUNT		RATE (%)	LOAN PERIOD (Yrs)	ANNUAL PAYMENT
RD Loan	\$ 1,114,386.70		2.875%	40	\$47,241.70
KIA Loan	\$ 200,000.00		1.002%	20	\$11,085.29
TOTALS	\$1,314,386.70				\$58,326.99
Total Annual Debt Payment Services = - \$58,326.99					
Total Annual O&M Costs = - \$ 293,848.08					
Total Annual Costs = \$352,175.07					
Total Annual 0-2 Year Flows (in 1000's) = 73,453 (Note 1)					
Total Annual Costs Per 1,000 Gallons = \$ 4.79 (Note 2)					
Minimum Recommended Charge Per 1,000 Gallons = \$ 5.75 (Note 3)					
Average Estimated Monthly Sewer Costs per Customer =					
		2,000 Gallons	3,000 Gallons	4,000 Gallons	
	\$	11.51	\$ 17.26	\$ 23.01	
Notes:					
1. Assumes only 75% of estimated flows are received for conservancy! Includes existing customers.					
2. Total Annual Cost Per 1,000 Gal. = Total Annual Costs / Total Annual 0-2 Year Flows (in 1,000's)					
3. Min. Rec. Charge Per 1,000 Gal. = Total Annual Costs Per 1,000 Gallons * Recommended Payback Ratio of 1.2					

**Table 8C-4
Summary of Potential Sewer Use Revenues (Based on Proposed Sewer Rates)**

Area #	SERVICE AREA	Population Equivalent (Note 2)	Total Avg. Daily Flow (gpd)	MONTHLY REVENUES BY PHASE		
				0-2 Year	3-10 Year	11-20 Year
1	Douglas WWTP Expansion to 300,000 GPD	0	0	\$ -		
2	Buckfield	60	6,000	\$ 1,036		
3	Branham Heights	96	9,600	\$ 1,657		
4	Shelbiana	204	20,400	\$ 3,521		
5	Little Creek	432	43,200		\$ 7,457	
6	Robinson Creek	348	34,800		\$ 6,007	
7	Sugar Camp	230	23,000		\$ 3,970	
8	Little Robinson	617	61,700		\$ 10,650	
9	Douglas WWTP Expansion to 500,000 GPD	0	0			\$ -
10	Upgrade Existing Caney and Penny Road Line	0	0			\$ -
11	Indian Creek - Section 1	178	17,800			\$ 3,072
12	Indian Creek - Section 2	278	27,800			\$ 4,798
13	Indian Creek - Section 3	276	27,600			\$ 4,764
14	Jonancy - Section 2	142	14,200			\$ 2,451
15	Long Fork - Section 2	408	40,800			\$ 7,042
16	Caney Creek - Section 1	286	28,600			\$ 4,937
17	Caney Creek - Section 2	163	16,300			\$ 2,813
18	Caney Creek - Section 3	348	34,800			\$ 6,007
	PROBABLE MONTHLY REVENUES =	3,269	326,900	\$ 6,214	\$ 28,083	\$ 22,128
	PROBABLE ANNUAL REVENUES @ 100% OF ESTIMATED FLOWS =			\$ 74,565.46	\$ 336,994.44	\$ 265,535.88
	PROBABLE ANNUAL REVENUES @ 75% OF ESTIMATED FLOWS (Note 2) =			\$ 55,924.09	\$ 252,745.83	\$ 199,151.91
	PROBABLE TOTAL ANNUAL REVENUE AT ULTIMATE BUILDOUT (ASSUME @ 75% FLOW) =					\$ 507,821.83

NOTES

1. Revenue calculator above uses the recommended flat rate per 1,000 gallons as derived in Table 8C-3.
2. Assumes only 75% of estimated flows are received for conservancy when calculating estimated revenues!

SECTION 9 – CROSS-CUTTER CORRESPONDENCE AND MITIGATION

9.1 CORRESPONDENCE

Cross cutter correspondence letters were prepared and sent to the following public entities to put them on notice as to the preparation of this 201 facilities plan:

- United States Fish and Wildlife Service
- Kentucky Department of Fish and Wildlife Resources
- Kentucky Heritage Council
- United States Corps of Engineers
- Natural Resources Conservation Service

The letter sent to, and the response obtained from, each entity is attached hereto in the following pages for reference.



SUMMIT ENGINEERING, INC.

January 14, 2013

Attn: Supervisor
U.S. Fish & Wildlife Service
330 West Broadway, Suite 265
Frankfort, KY 40601

**Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky**

Ladies and Gentlemen:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, will be receiving a Wastewater Facilities Planning document whose purpose is described as follows:

To evaluate the existing wastewater collection, conveyance, and treatment system of the Lower Shelby Planning Area and evaluate the future needs of the system over the next 20-year period within the planning area on **Exhibit '8A-1'** attached hereto. The current report is simply a planning study to forecast flows and loads and determine future sewer service areas. There is no physical construction project associated with this study at this time. When the construction projects recommended by this study are under design, they will be submitted to the necessary public entities for review, comment, and permit (if required), prior to construction.

Please provide us with written comments or concerns you may have regarding this study and the potential sewer projects it may propose. This study will result in an improvement in water quality in the local area. If you do not respond within thirty days, we will assume you have no comments. See the attached **Exhibit '8A-1'** for a general location map of the proposed wastewater planning area.

Please feel free to give me a call if you have any questions or need additional information. I can be reached at (606) 432-1447 ext. 323 / jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, P.E.
Project Engineer

CC: Anshu Singh – Kentucky Division of Water
File



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

February 7, 2013

Mr. Jonathon Newman, P.E.
Project Engineer
Summit Engineering, Inc.
120 Prosperous Place, Suite 101
Lexington, KY 40509

Re: FWS 2013-B-0160; Summit Engineering, Inc.; Lower Shelby 201 Facilities Plan; located in Pike County, Kentucky

Dear Mr. Newman:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act (40 Stat. 775, as amended; 16 U.S.C. 703 *et seq.*), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must consider the “direct effects”, “indirect effects”, and “cumulative effects” of the proposed project. “Direct effects” are the effects that occur at the time of construction activities. “Indirect effects” are effects on listed species or critical habitat that are caused by the action and are later in time but are still reasonably certain to occur. “Cumulative effects” are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. Please inform us of any future actions and/or projects (*i.e.*; water tanks, water/sewer lines, electrical transmission lines, subdivisions, commercial development) that would reasonably occur as a result of the proposed project so that we may adequately analyze those effects.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity. The listed species are:

Group	Species	Common name	Legal* Status
Mammals	<i>Myotis sodalis</i>	Indiana bat	E
Crustaceans	<i>Cambarus veteranus</i>	Big Sandy Crayfish	Pe

* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat, Pe = Petitioned

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The proposed project site is located within habitat designated as “potential habitat” for the Indiana bat and we believe that forested areas in the vicinity of and on the project area may potentially provide suitable summer roosting and foraging habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we would have the following recommendations relative to Indiana bats.

- The project proponent can modify the proposed project to eliminate or reduce impacts to potential Indiana bat roost trees. If this is not practicable, we would recommend that the project proponent only remove potential roost trees within the project area between October 15 and March 31 in order to avoid directly impacting summer roosting Indiana bats. Removing trees during the specified “unoccupied” period avoids direct effects to

Indiana bats. The resulting indirect and cumulative effects to Indiana bats from habitat removal are often determined to be insignificant or discountable. However, sometimes additional measures, including, but not limited to, further analysis, surveys, and/or mitigation, are necessary to address indirect and cumulative effects to ensure that the project is in full compliance with the ESA relative to the Indiana bat.

If your project schedule requires the clearing of potential Indiana bat roosting trees during the period of April 1 to October 14, you have two primary options for addressing impacts to Indiana bats:

- The project proponent can survey the project site to determine the presence or absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.
- The project proponent can enter into a Conservation Memorandum of Agreement (MOA) with the Service to gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

Big sandy crayfish

The big sandy crayfish is a species for which the Service has received a formal petition from the public to list as endangered or threatened under the ESA. The Service has made a finding that there is "substantial information" indicating that the petitioned listing may be warranted. Petitioned species receive no statutory protection under the ESA, but the Service encourages cooperative conservation efforts for these species, and they are species that may warrant future protection under the ESA.

The big sandy crayfish is found in the Russell Fork, Levisa Fork, and Tug Fork drainages of Floyd and Pike Counties in Kentucky and in locations in Virginia and West Virginia. The species is found in clean, third-order streams with moderate gradients and abundant boulder/cobble substrate that are low in bedload sediments. We recommend designing proposed projects to incorporate measures to minimize the impacts that the proposed project will have on streams that contain big sandy crayfish. Recommended measures include the following:

- Maintain a buffer between the project area and streams that support big sandy crayfish populations.
- Utilize directional boring for each portion of the water line that will span a stream.
- Construction activities should take place in late summer/fall during low flows.

- Sediment Best Management Practices (BMPs) should be utilized and maintained. A plan for BMP implementation should be submitted to our office for approval.

Additional measures may be recommended as future research reveals a better understanding of the species and its threats.

Migratory Bird Treaty Act comments

There are a number of migratory non-game birds that are tolerant of and dependent upon light to moderate amounts of disturbance to maintain open habitat conditions (e.g. right-of-way habitat) for breeding, nesting, and foraging habitat. The Service recommends that activities involving disturbance (e.g. bush-hogging) to areas used by migratory nongame birds for breeding be restricted from April 15th through August 31st.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,



Virgil Lee Andrews, Jr.
Field Supervisor



SUMMIT ENGINEERING, INC.

January 14, 2013

Attn: Supervisor
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

**Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky**

Ladies and Gentlemen:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, will be receiving a Wastewater Facilities Planning document whose purpose is described as follows:

To evaluate the existing wastewater collection, conveyance, and treatment system of the Lower Shelby Planning Area and evaluate the future needs of the system over the next 20-year period within the planning area on **Exhibit '8A-1'** attached hereto. The current report is simply a planning study to forecast flows and loads and determine future sewer service areas. There is no physical construction project associated with this study at this time. When the construction projects recommended by this study are under design, they will be submitted to the necessary public entities for review, comment, and permit (if required), prior to construction.

Please provide us with written comments or concerns you may have regarding this study and the potential sewer projects it may propose. This study will result in an improvement in water quality in the local area. If you do not respond within thirty days, we will assume you have no comments. See the attached **Exhibit '8A-1'** for a general location map of the proposed wastewater planning area.

Please feel free to give me a call if you have any questions or need additional information. I can be reached at (606) 432-1447 ext. 323 / jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, P.E.
Project Engineer

CC: Anshu Singh – Kentucky Division of Water
File



STEVEN L. BESHEAR
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL**

MARCHETA SPARROW
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

LINDY CASEBIER
ACTING EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

February 20, 2013

Mr. Jonathan Newman
Summit Engineering, Inc.
120 Prosperous Place, Suite 101
Lexington, KY 40509

Re: Lower Shelby 201 Facilities Plan, Pike County, Kentucky

Dear Ms. Newman:

Thank you for your correspondence concerning the above referenced project. Our review indicates that the proposed project for creating facilities plans will not impact any National Register properties or sites. In accordance with 36 CFR Part 800.4(d) of the Advisory Council's revised regulations our finding is that there will be **No Historic Properties Affected**.

We do look forward to commenting and participating in discussions of effects to archaeological and historic sites on any future construction projects. Should you have any questions, please contact Philip Mink of my staff at (502)564.7005, ext. 112, or at Philip.Mink@ky.gov.

Sincerely,

Lindy Casebier
Acting Executive Director and
State Historic Preservation Officer

LC:pbm



SUMMIT ENGINEERING, INC.

January 14, 2013

ATTN; SUPERVISOR
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

**Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky**

Ladies and Gentlemen:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, will be receiving a Wastewater Facilities Planning document whose purpose is described as follows:

To evaluate the existing wastewater collection, conveyance, and treatment system of the Lower Shelby Planning Area and evaluate the future needs of the system over the next 20-year period within the planning area on **Exhibit '8A-1'** attached hereto. The current report is simply a planning study to forecast flows and loads and determine future sewer service areas. There is no physical construction project associated with this study at this time. When the construction projects recommended by this study are under design, they will be submitted to the necessary public entities for review, comment, and permit (if required), prior to construction.

Please provide us with written comments or concerns you may have regarding this study and the potential sewer projects it may propose. This study will result in an improvement in water quality in the local area. If you do not respond within thirty days, we will assume you have no comments. See the attached **Exhibit '8A-1'** for a general location map of the proposed wastewater planning area.

Please feel free to give me a call if you have any questions or need additional information. I can be reached at (606) 432-1447 ext. 323 / jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, P.E.
Project Engineer

CC: Anshu Singh – Kentucky Division of Water
File



**KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
TOURISM, ARTS, AND HERITAGE CABINET**

Steven L. Beshear
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

Marcheta Sparrow
Secretary

Dr. Jonathan W. Gasset
Commissioner

18 January 2013

Jonathan Newman, P.E.
Project Engineer
Summit Engineering, Inc.
120 Prosperous Place, Suite 101
Lexington, KY 40509

RE: Lower Shelby 201 Facilities Plan
Pike County, Kentucky

Dear Mr. Newman:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information regarding the subject project. The Kentucky Fish and Wildlife Information System indicates no federally - threatened/endangered species are known to occur within close proximity to the project site. The Wehrle's Salamander (*Plethodon wehrlei*), Big Sandy Crayfish (*Cambarus veteranus*), Virginia Bladetooth (*Patera panselenus*), Eastern Small-footed Myotis (*Myotis leibii*), and American Black Bear (*Ursus americanus*) are state-listed species known to occur within the Proposed and/or Existing Lower Shelby 201 Area. Once project plans are ready for review, the KDFWR will review and provide comments regarding those projects in regards to threatened/endangered species, erosion control, etc. Please be aware that our database system is a dynamic one that only represents our current knowledge of various species distributions.

I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

A handwritten signature in black ink that reads "Dan Stoelb".

Dan Stoelb
Wildlife Biologist

Cc: Environmental Section File



SUMMIT ENGINEERING, INC.

January 14, 2013

ATTN: SUPERVISOR
U.S. Army Corps of Engineers
Huntington District
502 Eighth Street
Huntington, West Virginia 25701

**Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky**

Ladies and Gentlemen:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, will be receiving a Wastewater Facilities Planning document whose purpose is described as follows:

To evaluate the existing wastewater collection, conveyance, and treatment system of the Lower Shelby Planning Area and evaluate the future needs of the system over the next 20-year period within the planning area on **Exhibit '8A-1'** attached hereto. The current report is simply a planning study to forecast flows and loads and determine future sewer service areas. There is no physical construction project associated with this study at this time. When the construction projects recommended by this study are under design, they will be submitted to the necessary public entities for review, comment, and permit (if required), prior to construction.

Please provide us with written comments or concerns you may have regarding this study and the potential sewer projects it may propose. This study will result in an improvement in water quality in the local area. If you do not respond within thirty days, we will assume you have no comments. See the attached **Exhibit '8A-1'** for a general location map of the proposed wastewater planning area.

Please feel free to give me a call if you have any questions or need additional information. I can be reached at (606) 432-1447 ext. 323 / jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, P.E.
Project Engineer

CC: Anshu Singh – Kentucky Division of Water
File



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
<http://www.lrl.usace.army.mil/>

February 25, 2013

Operations Division
Regulatory Branch (South)
ID No. LRL-2013-164-mlc

Mr. Jonathan Newman
Summit Engineering, Inc.
120 Prosperous Place, Suite 101
Lexington, Kentucky 40509

Dear Mr. Newman:

This is in regard to your letter dated January 14, 2013, for a review on the Lower Shelby 201 Facilities Plan located in Pike County, Kentucky concerning the evaluation of the existing wastewater collection system, conveyance, and treatment system over the next 20-year period, and associated future construction which may result from these evaluations.

The U.S. Army Corps of Engineers (USACE) exercises regulatory authority under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act, 1972 (33 USC 1344) for certain activities in "waters of the United States (U.S.)." Section 404 requires that a Department of the Army (DA) permit be obtained for the placement or discharge of dredged and/or fill material into "waters of the U.S.," including wetlands, prior to conducting the work.

"Waters of the U.S.," include hydrologically connected lakes, rivers and stream channels exhibiting an Ordinary High Water Mark (OHWM), wetlands, sloughs, wet meadows and wetlands adjacent to "waters of the U.S." The OHWM elevation is the line on the bank established by the changing water surface and indicated by physical characteristics such as a clear natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; and other indications as determined upon inspection of the area.

Section 10 requires that a DA permit be obtained for any work that occurs in, under, or over a navigable water. These waters include all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce.

Based on the information provided by you, "waters of the U.S." may be located within the project area. "Waters of the U.S." may include any stream channels (perennial, intermittent, ephemeral) and/or hydrologically connected lakes exhibiting an OHWM and any adjacent wetlands within the proposed project area. A jurisdictional determination must be completed if the Lower Shelby 201 Facilities Plan would impact any "waters of the U.S.," including wetlands.

Our comments on this project are limited to only those effects which may fall within our area of jurisdiction and thus does not obviate the need to obtain other permits from State or local agencies.

If the project would necessitate the discharge of dredged or fill material into any "waters of the U.S.," including jurisdictional wetlands, then you should submit a DA permit application for review by this office. We will need a completed DA permit application along with additional details regarding the project's design, scope, photos, construction methods, purpose and the locations (coordinates) of all "waters of the U.S." Please allow sufficient time in your preconstruction schedule for the processing of a DA permit application. Copies of DA permit application forms can be obtained by writing to the above address ATTN: CELRL-OP-FS or online at <http://www.lrl.usace.army.mil/Missions/Regulatory.aspx>.

If we can be of any further assistance, please contact us by writing to the above address ATTN: CELRL-OP-FS, or by calling me at 502-315-6709.

Sincerely,



Meagan Chapman
Project Manager
Regulatory Branch



SUMMIT ENGINEERING, INC.

January 14, 2013

ATTN: SUPERVISOR
Natural Resources Conservation Service
771 Corporate Drive, Suite 210
Lexington, Kentucky 40503

**Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky**

Ladies and Gentlemen:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, will be receiving a Wastewater Facilities Planning document whose purpose is described as follows:

To evaluate the existing wastewater collection, conveyance, and treatment system of the Lower Shelby Planning Area and evaluate the future needs of the system over the next 20-year period within the planning area on **Exhibit '8A-1'** attached hereto. The current report is simply a planning study to forecast flows and loads and determine future sewer service areas. There is no physical construction project associated with this study at this time. When the construction projects recommended by this study are under design, they will be submitted to the necessary public entities for review, comment, and permit (if required), prior to construction.

Please provide us with written comments or concerns you may have regarding this study and the potential sewer projects it may propose. This study will result in an improvement in water quality in the local area. If you do not respond within thirty days, we will assume you have no comments. See the attached **Exhibit '8A-1'** for a general location map of the proposed wastewater planning area.

Please feel free to give me a call if you have any questions or need additional information. I can be reached at (606) 432-1447 ext. 323 / jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, P.E.
Project Engineer

CC: Anshu Singh – Kentucky Division of Water
File

United States Department of Agriculture



1925 Old Main Street
Suite 2
Maysville, KY. 41056
Ph: 606-759-5570

To: Jonathan Newman, P.E.
Summit Engineering, Inc.
120 Prosperous Place, Suite 101
Lexington, KY 40509

01/24/2013

Re: Lower Shelby 201 Facilities Plan
Pike County, Kentucky

Mr. Newman,

According to your request, this is the planning phase and no construction is currently being undertaken. This agency will withhold comments on soils and impact to farmland until at a future time when the final decisions have been made on sewer line placement and/or areas that are to be disturbed.

For the purposes of this study, information on the soils of Pike County, KY is available on-line using the USDA's Web Soil Survey for Pike County.

If this office may be of additional assistance, please do not hesitate to contact my office in Maysville Ky. or contact the NRCS District Conservationist at 606-789-5263.

Steve Jacobs
Resource Soil Scientist, NRCS, Maysville, KY.
steve.jacobs@ky.usda.gov

cc: Christopher Slone, NRCS District Conservationist, Paintsville, KY

SECTION 10 – EVALUATION OF RECOMMENDED REGIONAL FACILITY PLAN

10.1 EVALUATION PLAN

10.1.1 ENVIRONMENTAL IMPACTS

10.1.1.1 Introduction

An important component of this facilities plan is the assessment of potential environmental impacts to the study area by the recommended plan. Environmental impacts should be considered as both long and short term and beneficial and adverse in nature.

10.1.1.2 Beneficial Environmental Impacts

The primary beneficial environmental impact of implementing the recommended plan is the protection and possible improvement of water quality in the creeks and streams in the area. Protecting and improving water quality may improve the quantity and diversity of plant and aquatic life forms. Additionally, the overall attractiveness of the area for future development may be increased. Eliminating unsafe or non-functional sewage discharges will have positive effects on human health and safety.

10.1.1.3 Adverse Environmental Impacts

Any adverse environmental impacts should be considered short term in nature. Adverse impacts would include increased silt runoff during construction, increased noise and dust during construction, possible inconvenience to traffic, and temporary displacement of wildlife and vegetation in the area.

10.1.1.4 Important Farmlands

The new wastewater plant and collection lines will not impact any available farmland in the Planning Area.

10.1.1.5 Historic / Archaeological Sites

No historic or archaeological sites will be disturbed by construction of any of the plan components as all components are anticipated to be constructed on existing previously disturbed rights of way.

10.1.1.6 Plant and Animal Communities

It is not anticipated that any rare or endangered plant or animal species will be disturbed by construction of plan components. See also 10.1.1.5.

10.1.1.7 Potential Health Hazards

Implementation of the plan should not create any adverse health hazards to the public.

10.1.2 INSTITUTIONAL STRUCTURE

TO BE DETERMINED.

10.1.3 FUNDING PLAN

Project Cost

The capital requirements and phasing of the selected plan (0-2 Year) are summarized in Table 8C-1 of Section 8C. The estimated project costs for the 0-2 year collection system and treatment works are \$2,691,981.00 and \$2,800,000.00 respectively for a 0-2 year project total of \$5,491,981.00.

Funding Plan (0-2 Year Planning Period)

It is impractical to identify funding for 3-20 year projects at this time. The Mountain Water Districts efforts are currently directed at funding the 0-2 year projects. Table 10-1 presents the proposed plan for funding of the 0-2 year plan.

**Table 10-1
Potential Sources of Funding for Phase 1 Sewer**

AGENCY	GRANT / LOAN	AMOUNT
EPA (Special Project Assistance)	GRANT	\$ 500,000.00
EDA	GRANT	\$ 200,000.00
KIA-SRF	LOAN	\$ 200,000.00
ARC	GRANT	\$ 500,000.00
RD	GRANT	\$ 477,594.30
RD	LOAN	\$ 1,114,386.70
CDBG (Joint City/County)	GRANT	\$ 500,000.00
COAL SEVERANCE	GRANT	\$ 2,000,000.00
GRAND TOTAL		\$5,491,981.00

Current Mountain Water District rates for sewer use are \$14.00 for the 2,000 gallons or less, and \$6.00 for every 1,000 gallons over. Sewer taps are \$2,600.00 each. It is not anticipated that MWD user rates will be changed. As determined in Section 8C, the anticipated average monthly bill for a 3,000 gallon per month sewer user will be \$17.26. This is less than the current \$20.00 monthly bill for 3,000 gallon user. As more sewer customers are connected to the system, it is anticipated that the proposed sewer rates may be reduced as operation and maintenance costs are not anticipated to increase greatly with the addition of new customers during the 0-10 year period.

10.1.4 IMPLEMENTATION SCHEDULE

10.1.4.1 Recommended Plan Implementation – General

The combined DOW review process typically takes twelve to eighteen months. This represents a significant project delay. Consequently, the Mountain Water District should proceed with implementation as soon as possible.

Actions Required

The Mountain Water District should begin the following activities:

- Review, approve, and adopt this Facilities Plan Update.
- Submit this Facilities Plan update to the Kentucky Division of Water for review, comment, and approval.
- Conduct a public hearing to discuss this Facilities Plan and receive input on the plan from the public

10.1.4.2 Recommended Plan Implementation – Schedule

See Table 10-2 for a preliminary implementation schedule for the proposed 0-2 year plan. The start of the 0-2 year planning window is assumed to begin at the start of construction of the 0-2 year planning period projects. It is estimated that construction of the 0-2 year plan will be completed between the years 2016 and 2017.

10.1.5 PUBLIC SUPPORT

In order for the public to be aware of the proposed plan and comment thereon, a public meeting will be held to discuss the selected alternatives, proposed user costs and financing. The public meeting will be held upon approval by the Kentucky Division of Water and completion of the preliminary review of the plan by the Mountain Water District. Notice of the public meeting will be published at least one week in advance of the meeting date in the newspaper of greatest circulation in the area. Appendix B contains all pertinent information relating to the public meeting process, including newspaper affidavits, copies of newspaper advertisements, and transcripts of the public meeting(s).

TABLE 10-2
 LOWER SHELBY 201 FACILITIES PLAN
 0-2 YEAR PLANNING PERIOD PROJECTS
 PRELIMINARY PROJECTS IMPLEMENTATION SCHEDULE

ITEM	2013				2014				2015			2016		2017		
	Winter 2013	Spring 2013	Summer 2013	Fall 2013	Winter 2014	Spring 2014	Summer 2014	Fall 2014	Winter 2015	Spring 2015	Summer 2015	Fall 2015	Winter - Summer 2016	Summer 2016	Winter - Summer 2017	Fall 2017
REVIEW & APPROVAL OF 201 PLAN																
FUNDING APPLICATION PROCESS																
DESIGN & PERMITTING																
DOW REVIEW AND APPROVAL																
BIDDING & AWARD																
CONSTRUCTION																
PROJECT CLOSEOUT																

SECTION 11 – DOCUMENTATION OF PUBLIC PARTICIPATION

11.1 PUBLIC HEARING DOCUMENTATION

The following documents are attached in the following pages for reference:

1. Copy of newspaper affidavit advertising public meeting
2. A description of measures taken to solicit public participation
3. A copy of power point presentation given during public meeting
4. Public meeting attendance sheet (sign in sheet)
5. Copy of public comments received

SECTION 12 – REGIONAL FACILITY PLAN COMPLETENESS CHECKLIST FORMS

Section 12: Regional Facility Plan Completeness Checklist and Forms

Requirements: Two (2) hard copies, one certified by a professional engineer licensed in Kentucky and one (1) non-certified digital copy of the regional facility plan and the planning area shapefile on a Compact Disc (CD) shall be submitted to the Cabinet. This completeness checklist should be completed and submitted with each regional facility plan.

Regional Planning Agency Name: Mountain Water District

Date: 4/30/13

		<u>PAGE #</u>
SECTION 1		
REGIONAL FACILITY PLAN SUMMARY- This section shall provide a brief summary of the information provided in the facility plan, including the following:		
1.	Purpose of the plan and major problems evaluated in the plan.	1-1
2.	Recommended alternative chosen to remediate or correct the problems and/or serve the area of need identified in the plan. Also, include any institutional arrangements necessary to implement the recommended alternative(s).	1-1
3.	Estimated cost of implementing the proposed plan (including user fees) and the proposed funding method to be used.	1-2
4.	Planning agency commitments necessary to implement the plan.	1-2
5.	Schedule of implementation for projects.	1-2
SECTION 2		
STATEMENT OF PURPOSE AND NEED- This section shall contain a brief description of the purpose and need for a submitting the facility plan.		2-1
SECTION 3		
PHYSICAL CHARACTERISTICS OF THE PLANNING AREA- This section shall delineate the planning area boundaries and describe key topographic, geographic and pertinent natural or man-made features of the area. Digital or electronic submission of the planning area boundary shapefile in a standard GIS format shall also be included. This section shall also include the following maps:		
1.	One (1) up-to-date map, suitable for photocopying, indicate the planning area boundary, service area boundary, watershed boundaries, county lines, populated places, cities and/or towns and project areas or proposed planning period phases.	3-3
2.	One (1) up-to-date map, suitable for photocopying, include locations of wastewater treatment facilities (including package treatment plants), discharge location(s), collection lines (gravity, force main, interceptors), pump stations, public drinking water intake points and groundwater supply areas [Source Water Area Protection Plans (SWAPP) and/or Wellhead Protection Areas (WHPA)].	6-4
3.	One (1) seven and one-half (7 ½) minute USGS topographic map including the location of wetlands, delineation of the 100-year floodplain, surface water(s), and topography.	3-5

4.	If available, a local planning and zoning land use map.	3-6
SECTION 4		
SOCIOECONOMIC CHARACTERISTICS OF THE PLANNING AREA- The following characteristics of the planning area shall be discussed:		
1.	Historical, current, and projected population in the planning area including wastewater contributions from industrial and commercial sources.	4-1
2.	Current and projected population in the existing service area and unsewered parts of the planning area	4-2
3.	Economic or social benefit to the affected community	4-3
SECTION 5		
EXISTING ENVIRONMENT IN THE PLANNING AREA- Describe existing physical, biological, cultural, and other resource features within the planning area with an emphasis on those that may be impacted by the proposed plan or projects, including the following:		
1.	Physical features such as surface and groundwater quality, water sources and supply, wetlands, lakes, streams, air pollution, floodplains, soils, geology, and topography	5-1
2.	Biological: Identify plant and animal communities in the planning area with an emphasis upon endangered and threatened species likely to be impacted	5-2
3.	Cultural: Describe archaeological and historical resources that may be affected by the proposed project	5-3
4.	Other Resource Features such as national and state parks, recreational areas, USDA Designated Important Farmland, and any other applicable environmentally sensitive areas	5-3
SECTION 6		
EXISTING WASTEWATER SYSTEM- This section shall be prepared by a Professional Engineer licensed in Kentucky. A description of the existing facilities within the planning area shall include the following:		
1.	On-site systems in the planning area	6-1
2.	Physical condition of the existing wastewater treatment plant(s) including the type, age, design capacity, process units, peak and average wastewater flows, current discharge permit limits, schematic layout of treatment plant. Include a narrative description of the capacity of the treatment plant to meet reliability and redundancy requirements as outlined in regulation 401 KAR 5:005, Section 13.	6-1
3.	Existing collection and conveyance system and its condition	6-1
4.	Existing biosolids disposal method	6-3
5.	Existing operation, maintenance and compliance issues	6-3
SECTION 7		
FORECASTS OF FLOWS AND WASTE LOADS IN THE PLANNING AREA- This section shall be prepared by a professional engineer licensed in Kentucky and shall include:		
1.	Current and projected commercial, industrial and residential growth for the proposed planning period	7-1
2.	A copy of the waste load allocation (WLA) issued by the DOW for new or expanded treatment plant projects	7-3

SECTION 8		
EVALUATION OF ALTERNATIVES- This section shall be prepared by a professional engineer licensed in Kentucky and include an assessment of alternatives to determine the appropriate facilities that will meet the wastewater needs of the planning area and provide benefits that are cost-effective and environmentally sound. The section shall include:		
1.	No-action alternative	8B-1
2.	Optimization of existing facilities	8B-1
3.	Regionalization	8C-1
4.	Other alternatives	8A-2
5.	Detailed cost analysis along with 20 year present worth analysis for each alternative	8A-7, 8B-3
6.	Recommended alternative	8C-1
SECTION 9		
CROSS-CUTTER CORRESPONDENCE AND MITIGATION- Each facility plan shall include cross-cutter correspondences to and from each agency related to the following four environmental and cultural concerns:		
1.	Threatened and Endangered Species: The U.S. Fish and Wildlife Service- Kentucky Ecological Services Field Station and the Kentucky Department of Fish and Wildlife Resources	9-1
2.	Historical Resources: The Kentucky Heritage Council State Historic Preservation Office	9-1
3.	Aquatic Resources: The US. Army Corps of Engineers (Louisville, Nashville, or Huntington Districts).	9-1
4.	Agricultural Resources: The local office of the Natural Resources Conservation Service (NRCS) or USDA Service Center	9-1
SECTION 10		
EVALUATION OF RECOMMENDED REGIONAL FACILITY PLAN- This section of the facility plan shall summarize the critical components of the recommended plan.		
1.	Environmental impacts	10-1
2.	Institutional structure	10-2
3.	Funding plan	10-2
4.	Current and projected residential user charge rate based on 4,000 gallon usage per month	10-3
5.	Implementation schedule	10-3
SECTION 11		
DOCUMENTATION OF PUBLIC PARTICIPATION- The section shall include a copy of the newspaper advertisement/proof of publication, attendance sheet, and public comments.		11-1

Unit Process Design Criteria Form

Unit Process	Number of Units ¹	Flow per Unit (MGD)	Design Criteria ²
Influent Pumping			
Screening			
Grit Removal			
Primary Clarification			
Biological Process			
Chemical Phosphorus Removal			
Final Clarification			
Disinfection			
RAS/WAS Pumping			
Sludge Treatment			
Sludge Dewatering			

1*The number of units shall be in accordance with the reliability/redundancy checklist

2*The design criteria shall be in accordance with 401 KAR 5:005 including Ten States Standards

Note: This is a suggested format only. The process listed here will not fit every project and will therefore need to be revised accordingly.

SECTION 13 – REFERENCES

1. U.S. Fish and Wildlife Service. <http://www.fws.gov/wetlands/Data/Mapper.html>. Pike County Wetlands Mapping.
2. Kentucky Geological Survey. <http://kgs.uky.edu/kgswweb/download/geology/landuse/lumaps.htm>. Pike County Land Use Mapping. Accessed April 1, 2012.
3. Federal Emergency Management Agency. <https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>. Flood Insurance Study for Pike County, Kentucky and Incorporated Areas Revised May 2 2008.
4. Kentucky State Data Center. Population and Employment Information. <http://ksdc.louisville.edu/sdc/census2000/sf1profiles/Pike.pdf>. 2000.
5. http://www.epa-echo.gov/cgi-bin/ideaotis.cgi?idea_database=MAPECHO_ICP&map_file=id13335510374234.txt. EPA Wastewater Treatment Plant Database.
6. National Wild and Scenic Rivers. <http://www.rivers.gov/wildriverslist.html>. Listing of Wild and Scenic Rivers for Kentucky.
7. Kentucky Department of Fish and Wildlife Resources. <http://fw.ky.gov/>. Endangered Species Research.
8. <http://www.bls.gov/bls/inflation.htm>. CPI Inflation Calculator.

APPENDICES

Appendix A	Correspondence
Appendix B	Public Hearing
Appendix C	Waste Load Allocation
Appendix D	Construction Cost Estimates, Operation & Maintenance Cost Estimates, and Corresponding Project Area Exhibits
Appendix E	Sewer Use Agreement
Appendix F	Signed Ordinance Approving the Lower Shelby 201 Facilities Planning Area
Appendix G	Signed Ordinance Defining the Creation and Legal Standing of the Mountain Water District

APPENDIX A

CORRESPONDENCE



August 31, 2012

Courtney Seitz
Division of Water
Surface Water Permits Branch
200 Fair Oaks Lane
Frankfort, KY 40601

**RE: Mountain Water District
Douglas Wastewater Treatment Plant
Waste Load Allocation
KPDES Permit No. KY0042811**

Mr. Seitz,

This letter is prepared as a request for Waste Load Allocation limits for the Douglas Wastewater Treatment Plant. An expansion project for the plant is currently in the early design phase and the 201 facilities plan is being updated. The plant discharges into Shelby Creek of the Levisa Fork of the Big Sandy River at mile point 8.0, or 37° 22' 58.73" N latitude and 82° 32' 22.61" W longitude. The current design capacity of the plant is 0.2 MGD. The expansion project will increase the design capacity to 0.3 MGD; however the proposed ultimate build-out per the updated 201 plan will be 0.5 MGD.

A map depicting the location of the plant on USGS mapping is attached. Should you have any questions or require additional information, please contact me at (606) 432-1447 ext. 323 or jnewman@summit-engr.com.

Sincerely,

Jonathan Newman, E.I.T.
Project Manager

cc: file

Jonathan Newman

From: Jonathan Newman <jnewman@summit-engr.com>
Sent: Wednesday, January 16, 2013 11:43 AM
To: 'DOWOpenRecords@ky.gov'
Subject: Request for Information

To whom it may concern,

This email is being sent to request compliance histories for the Douglas Wastewater Treatment Plant (KY0042811) and its collection system. The plant and collection system are located in Pike County and operated by the Mountain Water District.

Thanks,

Jonathan Newman, P.E.
SUMMIT ENGINEERING
(606) 432-1447 EXT. 323

APPENDIX B

PUBLIC HEARING

APPENDIX C

WASTELOAD ALLOCATION



STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

October 12, 2012

Jonathan Newman, E.I.T.
Project Manager
Summit Engineering, Incorporated
120 Prosperous Place, Suite 101
Lexington, Kentucky 40509

Re: Waste Load Allocation (WLA) Update Request
Mountain Water District / Douglas Wastewater
Treatment Plant (WWTP)
KPDES No.: KY0042811
Pike County, Kentucky

Dear Mr. Newman:

This is in response to your August 31, 2012 letter, requesting a WLA for expansion of the existing 0.2 MGD WWTP to 0.3 MGD and ultimately to 0.5 MGD. Discharge is to remain at mile point (mp) 8.0 of Shelby Creek, 37°22'58.73" N latitude and 82°32'22.61" W longitude, segment 01026. The WLA information provided will be utilized in preparation of a Regional Wastewater Facilities Plan update. It is noted that effluent limitations were previously provided for expansion of the subject facility in Division of Water (DOW) correspondence dated December 29, 1999 (see attached).

Based on information contained in the 2010 Integrated Report, 303(d) List of Surface Waters, Shelby Creek (mp 6.0 to 13.3) is impaired. The impaired use listed is warm water aquatic habitat (partial support). The pollutants of concern listed are: nutrient/eutrophication biological indicators, organic enrichment (sewage) biological indicators, and sedimentation/siltation. Suspected sources of pollution are: channelization, loss of riparian habitat, petroleum/natural gas activities, and surface mining. State and Federal regulations allow new or expanded discharges into impaired streams only if the discharge will improve or at least not contribute to existing impairments. Discharge from an expanded and upgraded WWTP, in compliance with Kentucky Pollutant Discharge Elimination System (KPDES) permit limitations and requirements, including the addition of a total phosphorus limitation and total nitrogen monitoring requirement, would facilitate an improvement in water quality, and could thus be approved.

Effluent limitations applicable to the subject facility are stated below. The requirements specified are essentially the same as those provided in DOW correspondence dated December 29, 1999, with the following exceptions:

- Considering the abovementioned stream impairments, a limitation for total phosphorus and monitoring requirement for total nitrogen have been added.
- The Reliability Classification has been changed from Grade 3 to Grade C, based on revised requirements specified in 401 KAR 5:005, Section 13.

Design Capacity = 0.3 MGD or 0.5 MGD / Discharge to Shelby Creek near mp 8.0

<u>Parameter</u>	<u>May 1 - October 31</u>	<u>November 1 - April 30</u>
CBOD ₅	15 mg/l	15 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	4 mg/l	10 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Total Phosphorus	1 mg/l	1 mg/l
Total Nitrogen	Monitor, mg/l	Monitor, mg/l

Reliability Classification = Grade C

In addition to the above limits, the monthly average and maximum weekly average values of Escherichia coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. Additional effluent limits and water quality standards are contained in 401 KAR Chapter 5 and 401 KAR Chapter 10.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment facilities. Construction and KPDES permit applications must be submitted to request such authorization. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this correspondence, please contact me at (502) 564-8158, extension 4914 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,



Courtney Seitz, WLA Coordinator
Wet Weather Section
Surface Water Permits Branch
Division of Water

CS

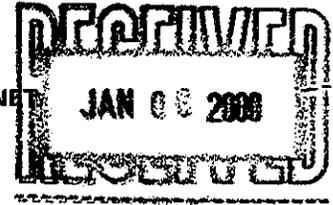
c: Anshu Singh, Water Infrastructure Branch
Compliance and Technical Assistance
Branch, Hazard Section
Division of Water Files

JAMES E. BICKFORD
SECRETARY



PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601



December 29, 1999

Gregory S. Lubeck, P.E.
Summit Engineering Inc.
120 Prosperous Place
Suite 101
Lexington, Kentucky 40509

Re: Douglas WWTP Expansion
Pike County, Kentucky

Dear Mr. Lubeck:

We have reviewed your request for expansion of this facility. The first flow amount you requested (0.2 mgd) is the current flow amount listed on the KPDES discharge permit. The permit also lists the discharge point as already being into Shelby Creek, and the limits on the existing permit were established for this condition. If the facility currently discharges to the small tributary that you noted on the map, the limits would not be any different. Effluent limits for an expansion of 0.35 mgd or 0.5 mgd would remain the same as currently noted on the permit. Moving the discharge point a short distance downstream would have no impact. The facility currently is listed as discharging to Shelby Creek, segment number 01026, mile point 8.2.

We concur in this proposal with the following provisions:

The wastewater treatment facilities must be designed to produce the following effluent concentrations, which are applicable at either flow.

	<u>May 1-Oct. 31</u>	<u>Nov. 1-April 30</u>
CBOD ₅	15 mg/l	15 mg/l
Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	4 mg/l	10 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Reliability Classification	Grade 3	

In addition to the above, the monthly average and weekly maximum values of fecal coliform shall be at or below 200 or 400, respectively, the year around. If a form of chlorine is proposed for use to disinfect the wastewater, then dechlorination will be required by your Kentucky Pollutant Discharge Elimination System (KPDES) permit. Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

These preliminary design effluent limits are valid for one (1) year from this date and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting procedure and do not guarantee issuance of a permit. These preliminary effluent limits are contingent upon the validity, accuracy, and completeness of the data and information which you have submitted.



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Mr. Gregory S. Lubeck
Douglas WWTP Expansion
Page Two

This letter does not approve the design details of the treatment system and does not authorize construction of these facilities. Some suitable form of effluent post aeration may also be necessary in order to produce the required dissolved oxygen concentration. This design should be included in the plans and specifications for the treatment system.

Approval of this project will be subject to the rules and regulations set forth by the Cabinet for submission of plans and specifications as well as the necessary legal documents.

If you have any questions concerning this correspondence, do not hesitate to call Dave Leist at (502) 564-2225, extension 456.

Sincerely,



R. Bruce Scott, P.E.
Environmental Engineer Branch Manager
KPDES Branch
Division of Water

RBS:DL:pg

c: Facilities Construction Branch
Hazard Regional Office
Division of Water Files

APPENDIX D

CONSTRUCTION COST ESTIMATES,
OPERATION & MAINTENANCE COST ESTIMATES AND
CORRESPONDING PROJECT AREA EXHIBITS

TABLE D-1
ALTERNATE 1 - PRESSURE SEWER SYSTEM
COST SUMMARY FOR PLANNING AREA

Contract #	LOCATION	AMOUNT
	DESCRIPTION	
1	Douglas WWTP Expansion to 300,000 GPD	N/A
2	Buckfield	\$ 306,740.00
3	Branham Heights	\$ 529,874.00
4	Shelbiana	\$ 958,040.00
5	Little Creek	\$ 2,233,875.00
6	Robinson Creek	\$ 1,715,146.00
7	Sugar Camp	\$ 1,112,972.00
8	Little Robinson	\$ 3,343,396.00
9	Douglas WWTP Expansion to 500,000 GPD	N/A
10	Upgrade Existing Caney and Penny Road Line	\$ 1,613,413.00
11	Indian Creek - Section 1	\$ 1,198,261.00
12	Indian Creek - Section 2	\$ 1,490,766.00
13	Indian Creek - Section 3	\$ 1,440,249.00
14	Jonancy - Section 2	\$ 646,943.00
15	Long Fork - Section 2	\$ 2,407,373.00
16	Caney Creek - Section 1	\$ 1,591,474.00
17	Caney Creek - Section 2	\$ 1,133,891.00
18	Caney Creek - Section 3	\$ 1,679,143.00
SUBTOTAL CONSTRUCTION COST		\$ 23,401,556.00
CONTINGENCY @ 15%		\$ 3,510,233.40
RIGHT OF WAY, ENGINEERING, INSPECTION, LEGAL SERVICES, BOND COUNCIL @ 35%		\$ 8,190,544.60
ESTIMATED PROJECT COST		\$ 35,102,334.00

TABLE 1
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
BUCKFIELD

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 8,935.00
	Landscape Allowance	Mile	\$ 1,000.00	2	\$ 2,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	2	\$ 4,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	750	\$ 30,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	2	\$ 6,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	3,750	\$ 52,500.00
	2" SDR11 HDPE	LF	\$ 15.00	510	\$ 7,650.00
	3" SDR11 HDPE	LF	\$ 17.00	1,660	\$ 28,220.00
	4" SDR11 HDPE	LF	\$ 19.00	710	\$ 13,490.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	120	\$ 18,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	363	\$ 5,445.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	25	\$ 125,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 306,740.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 2
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
BRANHAM HEIGHTS

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 15,434.00
	Landscape Allowance	Mile	\$ 1,000.00	3	\$ 3,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	3	\$ 6,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	300	\$ 12,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	3	\$ 9,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	1,650	\$ 23,100.00
	2" SDR11 HDPE	LF	\$ 15.00	630	\$ 9,450.00
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	8,390	\$ 159,410.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	40	\$ 5,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	932	\$ 13,980.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	10	\$ 50,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	1	\$ 20,000.00
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	1	\$ 2,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	1	\$ 100,000.00
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 529,874.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 3
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
SHELBIANA

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 27,905.00
	Landscape Allowance	Mile	\$ 1,000.00	5	\$ 5,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	5	\$ 10,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	3	\$ 4,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	2,100	\$ 84,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	5	\$ 15,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	10,650	\$ 149,100.00
	2" SDR11 HDPE	LF	\$ 15.00	3,210	\$ 48,150.00
	3" SDR11 HDPE	LF	\$ 17.00	4,550	\$ 77,350.00
	4" SDR11 HDPE	LF	\$ 19.00	4,390	\$ 83,410.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	250	\$ 31,250.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	140	\$ 21,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	1,425	\$ 21,375.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	70	\$ 350,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	1	\$ 20,000.00
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	5	\$ 10,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 958,040.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 4
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
LITTLE CREEK

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 65,065.00
	Landscape Allowance	Mile	\$ 1,000.00	12	\$ 12,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	12	\$ 24,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	6	\$ 9,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	5,400	\$ 216,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	11	\$ 33,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	27,000	\$ 378,000.00
	2" SDR11 HDPE	LF	\$ 15.00	8,650	\$ 129,750.00
	3" SDR11 HDPE	LF	\$ 17.00	12,560	\$ 213,520.00
	4" SDR11 HDPE	LF	\$ 19.00	9,250	\$ 175,750.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	3,586	\$ 53,790.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	180	\$ 900,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	12	\$ 24,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,233,875.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 5
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
ROBINSON CREEK

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 49,956.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	4	\$ 6,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	3,600	\$ 144,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	7	\$ 21,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	18,150	\$ 254,100.00
	2" SDR11 HDPE	LF	\$ 15.00	2,450	\$ 36,750.00
	3" SDR11 HDPE	LF	\$ 17.00	3,280	\$ 55,760.00
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	12,110	\$ 266,420.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	40	\$ 5,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	40	\$ 7,000.00
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,144	\$ 32,160.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	120	\$ 600,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	1	\$ 20,000.00
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	9	\$ 18,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	1	\$ 175,000.00
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,715,146.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 6
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
SUGAR CAMP

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 32,417.00
	Landscape Allowance	Mile	\$ 1,000.00	6	\$ 6,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	6	\$ 12,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	3	\$ 4,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	2,880	\$ 115,200.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	6	\$ 18,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	14,400	\$ 201,600.00
	2" SDR11 HDPE	LF	\$ 15.00	1,900	\$ 28,500.00
	3" SDR11 HDPE	LF	\$ 17.00	7,040	\$ 119,680.00
	4" SDR11 HDPE	LF	\$ 19.00	3,090	\$ 58,710.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	1,491	\$ 22,365.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	96	\$ 480,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	7	\$ 14,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,112,972.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 7
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
LITTLE ROBINSON

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 97,381.00
	Landscape Allowance	Mile	\$ 1,000.00	16	\$ 16,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	16	\$ 32,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	8	\$ 12,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	7,710	\$ 308,400.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	14	\$ 42,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	38,550	\$ 539,700.00
	2" SDR11 HDPE	LF	\$ 15.00	6,210	\$ 93,150.00
	3" SDR11 HDPE	LF	\$ 17.00	7,890	\$ 134,130.00
	4" SDR11 HDPE	LF	\$ 19.00	5,680	\$ 107,920.00
	6" SDR11 HDPE	LF	\$ 22.00	13,680	\$ 300,960.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	40	\$ 6,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	120	\$ 21,000.00
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	4,117	\$ 61,755.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	257	\$ 1,285,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	18	\$ 36,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	1	\$ 150,000.00
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 3,343,396.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 8
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
UPGRADE EXISTING CANEY AND PENNY ROAD LINE

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 46,993.00
	Landscape Allowance	Mile	\$ 1,000.00	6	\$ 6,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	6	\$ 12,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	0	\$ -
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	0	\$ -
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	6	\$ 18,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	0	\$ -
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	18,160	\$ 454,000.00
	10" SDR11 HDPE	LF	\$ 30.00	11,720	\$ 351,600.00
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	650	\$ 130,000.00
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,988	\$ 44,820.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	0	\$ -
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	0	\$ -
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	1	\$ 250,000.00
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	1	\$ 300,000.00
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,613,413.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 9
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 1

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 34,901.00
	Landscape Allowance	Mile	\$ 1,000.00	5	\$ 5,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	5	\$ 10,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	3	\$ 4,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	2,220	\$ 88,800.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	5	\$ 15,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	11,100	\$ 155,400.00
	2" SDR11 HDPE	LF	\$ 15.00	2,970	\$ 44,550.00
	3" SDR11 HDPE	LF	\$ 17.00	4,890	\$ 83,130.00
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	4,760	\$ 104,720.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	1,484	\$ 22,260.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	74	\$ 370,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	5	\$ 10,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	1	\$ 150,000.00
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 1,198,261.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 10
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 43,421.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	4	\$ 6,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	3,480	\$ 139,200.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	7	\$ 21,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	17,400	\$ 243,600.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	16,950	\$ 372,900.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	80	\$ 14,000.00
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,043	\$ 30,645.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	116	\$ 580,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	8	\$ 16,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,490,766.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 11
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 3

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 41,949.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	4	\$ 6,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	3,450	\$ 138,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	7	\$ 21,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	17,250	\$ 241,500.00
	2" SDR11 HDPE	LF	\$ 15.00	6,490	\$ 97,350.00
	3" SDR11 HDPE	LF	\$ 17.00	7,430	\$ 126,310.00
	4" SDR11 HDPE	LF	\$ 19.00	5,370	\$ 102,030.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	40	\$ 5,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	80	\$ 12,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,274	\$ 34,110.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	115	\$ 575,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	8	\$ 16,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,440,249.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 12
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
JONANCY - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 18,843.00
	Landscape Allowance	Mile	\$ 1,000.00	4	\$ 4,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	4	\$ 8,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	2	\$ 3,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	1,770	\$ 70,800.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	3	\$ 9,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	8,850	\$ 123,900.00
	2" SDR11 HDPE	LF	\$ 15.00	1,410	\$ 21,150.00
	3" SDR11 HDPE	LF	\$ 17.00	4,080	\$ 69,360.00
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	40	\$ 5,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	726	\$ 10,890.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	59	\$ 295,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	4	\$ 8,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 646,943.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 13
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
LONG FORK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 70,118.00
	Landscape Allowance	Mile	\$ 1,000.00	12	\$ 12,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	12	\$ 24,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	6	\$ 9,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	5,100	\$ 204,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	11	\$ 33,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	25,500	\$ 357,000.00
	2" SDR11 HDPE	LF	\$ 15.00	10,390	\$ 155,850.00
	3" SDR11 HDPE	LF	\$ 17.00	6,700	\$ 113,900.00
	4" SDR11 HDPE	LF	\$ 19.00	14,840	\$ 281,960.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	40	\$ 5,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	80	\$ 12,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	3,703	\$ 55,545.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	170	\$ 850,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	12	\$ 24,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	1	\$ 100,000.00
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 2,407,373.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 14
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 1

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 46,354.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	4	\$ 6,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	3,570	\$ 142,800.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	8	\$ 24,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	17,850	\$ 249,900.00
	2" SDR11 HDPE	LF	\$ 15.00	2,570	\$ 38,550.00
	3" SDR11 HDPE	LF	\$ 17.00	3,630	\$ 61,710.00
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	13,830	\$ 304,260.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	100	\$ 12,500.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	200	\$ 35,000.00
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,360	\$ 35,400.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	119	\$ 595,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	8	\$ 16,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,591,474.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 15
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 33,026.00
	Landscape Allowance	Mile	\$ 1,000.00	5	\$ 5,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	5	\$ 10,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	3	\$ 4,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	2,040	\$ 81,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	4	\$ 12,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	10,200	\$ 142,800.00
	2" SDR11 HDPE	LF	\$ 15.00	1,550	\$ 23,250.00
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	8,780	\$ 193,160.00
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	200	\$ 35,000.00
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	1,237	\$ 18,555.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	68	\$ 340,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	5	\$ 10,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	1	\$ 125,000.00
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 1,133,891.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 16
OPINION OF PROBABLE CONSTRUCTION COST FOR
PRESSURE SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 3

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 48,908.00
	Landscape Allowance	Mile	\$ 1,000.00	9	\$ 9,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	9	\$ 18,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	5	\$ 7,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	4,350	\$ 174,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	8	\$ 24,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	21,750	\$ 304,500.00
	2" SDR11 HDPE	LF	\$ 15.00	5,530	\$ 82,950.00
	3" SDR11 HDPE	LF	\$ 17.00	6,410	\$ 108,970.00
	4" SDR11 HDPE	LF	\$ 19.00	5,360	\$ 101,840.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	80	\$ 10,000.00
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	80	\$ 12,000.00
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,165	\$ 32,475.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	145	\$ 725,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	10	\$ 20,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,679,143.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE D-2
ALTERNATE 2 - GRAVITY SEWER SYSTEM
COST SUMMARY FOR PLANNING AREA

Contract #	LOCATION	AMOUNT
	DESCRIPTION	
1	Douglas WWTP Expansion to 300,000 GPD	N/A
2	Buckfield	\$ 471,303.00
3	Branham Heights	\$ 696,033.00
4	Shelbiana	\$ 1,460,432.00
5	Little Creek	\$ 4,070,509.00
6	Robinson Creek	\$ 2,576,108.00
7	Sugar Camp	\$ 1,704,007.00
8	Little Robinson	\$ 4,658,304.00
9	Douglas WWTP Expansion to 500,000 GPD	N/A
10	Upgrade Existing Caney and Penny Road Line	\$ 1,613,413.00
11	Indian Creek - Section 1	\$ 1,861,725.00
12	Indian Creek - Section 2	\$ 2,262,164.00
13	Indian Creek - Section 3	\$ 2,456,087.00
14	Jonancy - Section 2	\$ 1,075,990.00
15	Long Fork - Section 2	\$ 4,130,790.00
16	Caney Creek - Section 1	\$ 2,549,456.00
17	Caney Creek - Section 2	\$ 1,361,583.00
18	Caney Creek - Section 3	\$ 2,495,304.00
SUBTOTAL CONSTRUCTION COST		\$ 35,443,208.00
CONTINGENCY @ 15%		\$ 5,316,481.20
RIGHT OF WAY, ENGINEERING, INSPECTION, LEGAL SERVICES, BOND COUNCIL @ 45%		\$ 15,949,443.60
ESTIMATED PROJECT COST		\$ 56,709,132.80

TABLE 17
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
BUCKFIELD

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 13,728.00
	Landscape Allowance	Mile	\$ 1,000.00	2	\$ 2,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	2	\$ 4,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	2,810	\$ 112,400.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	2,880	\$ 144,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	19	\$ 9,375.00
	Manhole	EA	\$ 3,500.00	14	\$ 50,400.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	1,050	\$ 14,700.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	120	\$ 24,000.00
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 43,200.00	1	\$ 43,200.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	6	\$ 30,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	1	\$ 20,000.00
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	1	\$ 2,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 471,303.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 18
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
BRANHAM HEIGHTS

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 20,273.00
	Landscape Allowance	Mile	\$ 1,000.00	3	\$ 3,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	3	\$ 6,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	1,240	\$ 49,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	1,500	\$ 75,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	8	\$ 26,250.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	750	\$ 10,500.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	8,390	\$ 159,410.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 22,500.00	1	\$ 22,500.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	3	\$ 15,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	2	\$ 40,000.00
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	1	\$ 2,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	1	\$ 65,000.00
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	1	\$ 100,000.00
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 696,033.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 19
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
SHELBIANA

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 42,537.00
	Landscape Allowance	Mile	\$ 1,000.00	5	\$ 5,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	5	\$ 10,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	7,990	\$ 319,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	9,320	\$ 466,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	53	\$ 26,625.00
	Manhole	EA	\$ 3,500.00	47	\$ 163,100.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	2,700	\$ 37,800.00
	2" SDR11 HDPE	LF	\$ 15.00	740	\$ 11,100.00
	3" SDR11 HDPE	LF	\$ 17.00	670	\$ 11,390.00
	4" SDR11 HDPE	LF	\$ 19.00	1,420	\$ 26,980.00
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	100	\$ 20,000.00
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 139,800.00	1	\$ 139,800.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	18	\$ 90,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	1	\$ 85,000.00
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,460,432.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 20
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
LITTLE CREEK

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 118,559.00
	Landscape Allowance	Mile	\$ 1,000.00	11	\$ 11,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	11	\$ 22,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	2	\$ 3,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	20,250	\$ 810,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	30,460	\$ 1,523,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	135	\$ 67,500.00
	Manhole	EA	\$ 3,500.00	152	\$ 533,050.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	6,750	\$ 94,500.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 456,900.00	1	\$ 456,900.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	45	\$ 225,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	3	\$ 6,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	1	\$ 100,000.00
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 4,070,509.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 21
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
ROBINSON CREEK

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 75,033.00
	Landscape Allowance	Mile	\$ 1,000.00	7	\$ 7,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	7	\$ 14,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	13,610	\$ 544,400.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	17,840	\$ 892,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	91	\$ 45,375.00
	Manhole	EA	\$ 3,500.00	89	\$ 312,200.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	4,500	\$ 63,000.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 267,600.00	1	\$ 267,600.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	30	\$ 150,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	1	\$ 200,000.00
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,576,108.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 22
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
SUGAR CAMP

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 49,632.00
	Landscape Allowance	Mile	\$ 1,000.00	6	\$ 6,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	6	\$ 12,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	10,800	\$ 432,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	12,030	\$ 601,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	72	\$ 36,000.00
	Manhole	EA	\$ 3,500.00	60	\$ 210,525.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	3,600	\$ 50,400.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 180,450.00	1	\$ 180,450.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	24	\$ 120,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,704,007.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 23
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
LITTLE ROBINSON

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 135,679.00
	Landscape Allowance	Mile	\$ 1,000.00	14	\$ 14,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	14	\$ 28,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	2	\$ 3,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	28,910	\$ 1,156,400.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	33,460	\$ 1,673,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	193	\$ 96,375.00
	Manhole	EA	\$ 3,500.00	167	\$ 585,550.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	9,600	\$ 134,400.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 501,900.00	1	\$ 501,900.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	64	\$ 320,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	5	\$ 10,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 4,658,304.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 24
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM (MUST BE PRESSURE)
UPGRADE EXISTING CANEY AND PENNY ROAD LINE

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 46,993.00
	Landscape Allowance	Mile	\$ 1,000.00	6	\$ 6,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	6	\$ 12,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	0	\$ -
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	0	\$ -
	8" diameter SDR 35 PVC	LF	\$ 50.00	0	\$ -
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	0	\$ -
	Manhole	EA	\$ 3,500.00	0	\$ -
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	6	\$ 18,000.00
	1.25" SDR11 HDPE	LF	\$ 14.00	0	\$ -
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	18,160	\$ 454,000.00
	10" SDR11 HDPE	LF	\$ 30.00	11,720	\$ 351,600.00
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	650	\$ 130,000.00
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 15.00	2,988	\$ 44,820.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	0	\$ -
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	0	\$ -
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	1	\$ 250,000.00
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	1	\$ 300,000.00
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,613,413.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 25
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 1

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 54,225.00
	Landscape Allowance	Mile	\$ 1,000.00	5	\$ 5,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	5	\$ 10,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	8,330	\$ 333,200.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	12,620	\$ 631,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	56	\$ 27,750.00
	Manhole	EA	\$ 3,500.00	63	\$ 220,850.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	2,850	\$ 39,900.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 189,300.00	1	\$ 189,300.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	19	\$ 95,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	1	\$ 150,000.00
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 1,861,725.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 26
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 65,889.00
	Landscape Allowance	Mile	\$ 1,000.00	7	\$ 7,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	7	\$ 14,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	13,050	\$ 522,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	16,950	\$ 847,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	87	\$ 43,500.00
	Manhole	EA	\$ 3,500.00	85	\$ 296,625.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	4,350	\$ 60,900.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 254,250.00	1	\$ 254,250.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	29	\$ 145,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,262,164.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 27
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
INDIAN CREEK - SECTION 3

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 71,537.00
	Landscape Allowance	Mile	\$ 1,000.00	7	\$ 7,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	7	\$ 14,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	12,940	\$ 517,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	19,290	\$ 964,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	86	\$ 43,125.00
	Manhole	EA	\$ 3,500.00	96	\$ 337,575.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	4,350	\$ 60,900.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 289,350.00	1	\$ 289,350.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	29	\$ 145,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,456,087.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 28
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
JONANCY - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 31,340.00
	Landscape Allowance	Mile	\$ 1,000.00	3	\$ 3,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	3	\$ 6,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	6,640	\$ 265,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	5,490	\$ 274,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	44	\$ 22,125.00
	Manhole	EA	\$ 3,500.00	27	\$ 96,075.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	2,250	\$ 31,500.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 82,350.00	1	\$ 82,350.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	15	\$ 75,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	1	\$ 2,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	1	\$ 85,000.00
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 1,075,990.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 29
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
LONG FORK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 120,315.00
	Landscape Allowance	Mile	\$ 1,000.00	11	\$ 11,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	11	\$ 22,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	2	\$ 3,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	19,130	\$ 765,200.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	31,930	\$ 1,596,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	128	\$ 63,750.00
	Manhole	EA	\$ 3,500.00	160	\$ 558,775.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	6,450	\$ 90,300.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 478,950.00	1	\$ 478,950.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	43	\$ 215,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	3	\$ 6,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	1	\$ 100,000.00
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	1	\$ 65,000.00
	ADD for Odor Control	EA	\$ 35,000.00	1	\$ 35,000.00
	ESTIMATED CONSTRUCTION COST				\$ 4,130,790.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 30
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 1

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 74,256.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	13,390	\$ 535,600.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	20,030	\$ 1,001,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	89	\$ 44,625.00
	Manhole	EA	\$ 3,500.00	100	\$ 350,525.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	4,500	\$ 63,000.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 300,450.00	1	\$ 300,450.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	30	\$ 150,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,549,456.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 31
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 2

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 39,658.00
	Landscape Allowance	Mile	\$ 1,000.00	4	\$ 4,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	4	\$ 8,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	1	\$ 1,500.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	7,650	\$ 306,000.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	10,330	\$ 516,500.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	51	\$ 25,500.00
	Manhole	EA	\$ 3,500.00	52	\$ 180,775.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	2,550	\$ 35,700.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 154,950.00	1	\$ 154,950.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	17	\$ 85,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	2	\$ 4,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 1,361,583.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 32
OPINION OF PROBABLE CONSTRUCTION COST FOR
GRAVITY SEWER COLLECTION AND CONVEYANCE SYSTEM
CANEY CREEK - SECTION 3

ITEM #	ITEM DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT
1	GENERAL				
	Mobilization/Demobilization	LS	3.00%	1	\$ 72,679.00
	Landscape Allowance	Mile	\$ 1,000.00	8	\$ 8,000.00
	Seeding and Cleanup	Mile	\$ 2,000.00	8	\$ 16,000.00
	Removal of Existing Septic Tank	EA	\$ 1,500.00	2	\$ 3,000.00
2	GRAVITY SEWER PIPE				
	4" diameter SDR 35 PVC	LF	\$ 40.00	16,310	\$ 652,400.00
	8" diameter SDR 35 PVC	LF	\$ 50.00	17,300	\$ 865,000.00
	Tee Wye - Lateral Stub Out Assembly	EA	\$ 500.00	109	\$ 54,375.00
	Manhole	EA	\$ 3,500.00	87	\$ 302,750.00
3	FORCE MAINS				
	Air/Vacuum Relief Assembly	EA	\$ 3,000.00	0	\$ -
	1.25" SDR11 HDPE	LF	\$ 14.00	5,400	\$ 75,600.00
	2" SDR11 HDPE	LF	\$ 15.00	0	\$ -
	3" SDR11 HDPE	LF	\$ 17.00	0	\$ -
	4" SDR11 HDPE	LF	\$ 19.00	0	\$ -
	6" SDR11 HDPE	LF	\$ 22.00	0	\$ -
	8" SDR11 HDPE	LF	\$ 25.00	0	\$ -
	10" SDR11 HDPE	LF	\$ 30.00	0	\$ -
4	STREAM CROSSING (Note 4)				
	3" Stream Crossing	LF	\$ 150.00	0	\$ -
	4" Stream Crossing	LF	\$ 175.00	0	\$ -
	6" Stream Crossing	LF	\$ 200.00	0	\$ -
	8" Stream Crossing	LF	\$ 225.00	0	\$ -
	10" Stream Crossing	LF	\$ 250.00	0	\$ -
5	ENCASEMENTS (Note 1)				
	Bore and Encasement for 3" Pipe	LF	\$ 125.00	0	\$ -
	Bore and Encasement for 4" Pipe	LF	\$ 150.00	0	\$ -
	Bore and Encasement for 6" Pipe	LF	\$ 175.00	0	\$ -
	Bore and Encasement for 8" Pipe	LF	\$ 200.00	0	\$ -
	Bore and Encasement for 10" Pipe	LF	\$ 225.00	0	\$ -
6	PAVEMENT REPLACEMENT				
	Bituminous Pavement Replacement (Note 3)	SF	\$ 259,500.00	1	\$ 259,500.00
7	RESIDENTIAL GRINDER PUMP STATION				
	Simplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 5,000.00	36	\$ 180,000.00
	Duplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 10,000.00	0	\$ -
	Quadplex Grinder Pump Station Complete and In Service with Pressure Sewer Lateral Assembly (Note 2)	EA	\$ 20,000.00	0	\$ -
	Residential Core Grinder Pump, Suitably Stored	EA	\$ 2,000.00	3	\$ 6,000.00
8	LIFT STATIONS				
	50 gpm Submersible Pump Station	EA	\$ 65,000.00	0	\$ -
	100 gpm Submersible Pump Station	EA	\$ 85,000.00	0	\$ -
	150 gpm Submersible Pump Station	EA	\$ 100,000.00	0	\$ -
	200 gpm Submersible Pump Station	EA	\$ 125,000.00	0	\$ -
	250 gpm Submersible Pump Station	EA	\$ 150,000.00	0	\$ -
	300 gpm Submersible Pump Station	EA	\$ 175,000.00	0	\$ -
	400 gpm Submersible Pump Station	EA	\$ 200,000.00	0	\$ -
	750 gpm Submersible Pump Station	EA	\$ 250,000.00	0	\$ -
	1000 gpm Submersible Pump Station	EA	\$ 300,000.00	0	\$ -
	Pump Station Backup Power	EA	\$ 65,000.00	0	\$ -
	ADD for Odor Control	EA	\$ 35,000.00	0	\$ -
	ESTIMATED CONSTRUCTION COST				\$ 2,495,304.00

Assumptions

1. Bore and encasement required under US and KY highways and railroads.
2. Individual grinder pump located at each customer with average 150 lf of 1.25" service line and 30LF of 4" lateral.
3. Bituminous Pavement Replacement is over width of trench only.
4. Stream crossings assumed to be 100' for creeks, 200' for rivers.

TABLE 33
EXPAND EXISTING EA PLANT ALTERNATE
ENGINEERS OPINION OF PROBABLE PROJECT COST

	ITEM	QTY	UNITS	UNIT PRICE	AMOUNT
1	GENERAL				
a	Mobilization/Demobilization	1	LS	\$ 60,000.00	\$ 60,000.00
b	Construction Staking	1	LS	\$ 5,000.00	\$ 5,000.00
c	Pavement Replacement	1	LS	\$ 10,000.00	\$ 10,000.00
d	Seeding and Clean-up	1	LS	\$ 5,000.00	\$ 5,000.00
2	TREATMENT PLANT EXPANSION				
	<i>Note - All pre-cast concrete to have Penetron or Xypex additive to increase hydrogen sulfide resistance.</i>				
2.1	Headworks				
a	Influent Pump Station Rehabilitation	1	LS	\$ 100,000.00	\$ 100,000.00
b	Aulick Odor Control System for Influent Pump Station	1	LS	\$ 15,000.00	\$ 15,000.00
c	Adapt Comminutor Channel to Receive Fine Screen (6 mm)	1	LS	\$ 100,000.00	\$ 100,000.00
2.2	Flow Equalization				
a	400,000 GPD Packaged Flow Splitter FOB to Site - Materials	1	LS	\$ 40,000.00	\$ 40,000.00
b	400,000 GPD Packaged Flow Splitter Installed and In Service	1	LS	\$ 20,000.00	\$ 20,000.00
c	OSHA-Approved Handrail / Guardrail	1	LS	\$ 3,000.00	\$ 3,000.00
d	Remove and Dispose of Accumulated Grit	1	LS	\$ 15,000.00	\$ 15,000.00
e	2 New Flow Equalization Pumps	1	LS	\$ 20,000.00	\$ 20,000.00
2.3	Existing EA Basins Rehabilitation				
a	Painting	1	LS	\$ 5,000.00	\$ 5,000.00
b	Decking	1	LS	\$ 15,000.00	\$ 15,000.00
c	Air Supply System - Diffusers, Valving, etc.	1	LS	\$ 20,000.00	\$ 20,000.00
2.4	Process				
a	100,000 GPD Packaged Pre-cast Concrete EA Basin w/ Dual Clarifiers and Sludge Holding FOB to Site (Note 1)	1	LS	\$ 460,000.00	\$ 460,000.00
b	100,000 GPD Packaged Pre-cast Concrete EA Basin w/ Dual Clarifiers and Sludge Holding Installed and In Service	1	LS	\$ 220,000.00	\$ 220,000.00
c	96 SF Pyradec Pre-cast Conc. Filter Units Rated at 500 GPD/SF, FOB to Site - Materials	9	EA	\$ 20,000.00	\$ 180,000.00
d	96 SF Pyradec Pre-cast Conc. Filter Units Rated at 500 GPD/SF, Installed and In Service	9	EA	\$ 10,000.00	\$ 90,000.00
e	Pyradec Pump Station	1	LS	\$ 60,000.00	\$ 60,000.00
f	Replace / Upgrade Existing Blowers	1	LS	\$ 50,000.00	\$ 50,000.00
g	Trailer-mounted 50 GPM Sludge Dewatering Press - In Service	1	LS	\$ 200,000.00	\$ 200,000.00
2.5	Disinfection and Post Aeration				
a	Demolish / Retrofit Rotary Filter for Chemical Application Room	1	LS	\$ 10,000.00	\$ 10,000.00
b	New Liquid Hypochlorite System (Outdoor Bulk Tank)	1	LS	\$ 10,000.00	\$ 10,000.00
c	New Thiosulfate System (Indoor Bulk Tank)	1	LS	\$ 5,000.00	\$ 5,000.00
d	Change Baffling in Post Aeration Tank to Increase Chlorine Contact	1	LS	\$ 20,000.00	\$ 20,000.00
2.6	Site				
a	Earthwork / Grading Exclusive of Process Items	1	LS	\$ 25,000.00	\$ 25,000.00
b	Yard Piping Modifications	1	LS	\$ 50,000.00	\$ 50,000.00
c	6" Gravel Pavement Underlain by Geotextile Type III	500	SY	\$ 15.00	\$ 7,500.00
d	Concrete Drive Widening	200	SY	\$ 50.00	\$ 10,000.00
2.7	Electrical				
a	Site Electric and Additional Power Center for 200,000 GPD Treatment Unit in Existing Motor Control Center	1	LS	\$ 50,000.00	\$ 50,000.00
b	Standby Generator - 200 kW	1	LS	\$ 100,000.00	\$ 100,000.00
2.8	Controls / Instrumentation				
a	DO Probe Hard Mounted in Each EA Basin and Post Aeration Basin	4	EA	\$ 5,000.00	\$ 20,000.00
b	Telemetry RTU for Plant Site	1	LS	\$ 25,000.00	\$ 25,000.00
c	6" Mag Meter on Influent Force Main	1	LS	\$ 10,000.00	\$ 10,000.00
d	24 Hour Composite, Refrigerated Sampler	1	LS	\$ 10,000.00	\$ 10,000.00
	SUBTOTAL CONSTRUCTION COSTS				\$ 2,045,500.00
3	NON-CONSTRUCTION COSTS				
a	Construction Contingency	1	LS	10.00%	\$ 204,550.00
b	Basic Engineering (Note 2)	1	LS	Fixed by Contract	\$ 127,537.46
c	Resident Inspection (Note 2)	1	LS	Fixed by Contract	\$ 106,389.06
	Additional Engineering Services				
d	Preliminary / Final Engineering Report	1	LS		\$ 5,000.00
e	Manual Library	1	LS		\$ 2,500.00
f	Upset Engineering Contingency	1	LS		\$ 10,000.00
g	CDBG Administration	1	LS		\$ 50,000.00
h	Geotechnical	1	LS		\$ 20,000.00
i	Environmental	1	LS		\$ 7,000.00
j	Miscellaneous (Public Notice / Legal / Permits)	1	LS		\$ 1,523.48
	PROBABLE PROJECT COST				\$ 2,580,000.00

NOTES

1. Tilt-up panel construction - one aeration basin and two clarifiers.
2. At RD Rate for a WWTP Project
3. As long as project is within existing fence - no ROW required.

**TABLE 34
BUILD NEW MBR PLANT AT EXISTING SITE ALTERNATE
ENGINEERS OPINION OF PROBABLE PROJECT COST**

	ITEM	QTY	UNITS	UNIT PRICE	AMOUNT
1	GENERAL				
a	Mobilization/Demobilization	1	LS	\$ 50,000.00	\$ 50,000.00
b	Construction Staking	1	LS	\$ 5,000.00	\$ 5,000.00
c	Pavement Replacement	1	LS	\$ 10,000.00	\$ 10,000.00
d	Seeding and Clean-up	1	LS	\$ 5,000.00	\$ 5,000.00
2	TREATMENT PLANT EXPANSION				
<i>Note - All pre-cast concrete to have Penetron or Xypex additive to increase hydrogen sulfide resistance.</i>					
2.1	Headworks				
a	Influent Pump Station Rehabilitation	1	LS	\$ 100,000.00	\$ 100,000.00
b	Aulick Odor Control System for Influent Pump Station	1	LS	\$ 20,000.00	\$ 20,000.00
c	3 Fine Screens (3.0 mm) Rated at 300 GPM Each in Weather-proof Facility - Materials	1	LS	Included in Item 2.3a	
2.2	Flow Equalization				
a	400,000 GPD Packaged Flow Splitter FOB to Site - Materials	1	LS	\$ 40,000.00	\$ 40,000.00
b	400,000 GPD Packaged Flow Splitter Installed and In Service	1	LS	\$ 20,000.00	\$ 20,000.00
c	OSHA-Approved Handrail / Guardrail for Existing Flow Eq. Tank	1	LS	\$ 5,000.00	\$ 5,000.00
d	Remove and Dispose of Accumulated Grit	1	LS	\$ 15,000.00	\$ 15,000.00
e	2 New Flow Equalization Pumps	1	LS	\$ 20,000.00	\$ 20,000.00
2.3	Process				
a	Plate Membrane Bioreactor (MBR) w/ Screening - Materials (Note 1)	1	LS	\$ 1,300,000.00	\$ 1,300,000.00
b	Plate Membrane Bioreactor (MBR) w/ Screening Installed and In Service	1	LS	\$ 300,000.00	\$ 300,000.00
c	Upgrade Existing Blowers	1	LS	Included in Item 2.3a	
d	20 CY FloTrend Tipping Stand Mounted Sludge Mate w/ Polymer System	1	LS	\$ 100,000.00	\$ 100,000.00
2.4	Disinfection and Post Aeration				
a	Demolish / Retrofit Rotary Filter for Chemical Application Room	1	LS	\$ 10,000.00	\$ 10,000.00
b	New Liquid Hypochlorite System (Outdoor Bulk Tank)	1	LS	\$ 10,000.00	\$ 10,000.00
c	New Thiosulfate System (Indoor Bulk Tank)	1	LS	\$ 5,000.00	\$ 5,000.00
d	Change Baffling in Post Aeration Tank to Increase Chlorine Contact	1	LS	\$ 20,000.00	\$ 20,000.00
2.5	Site				
a	Earthwork / Grading Exclusive of Process Items	1	LS	\$ 25,000.00	\$ 25,000.00
b	Yard Piping Modifications	1	LS	\$ 50,000.00	\$ 50,000.00
c	6" Gravel Pavement Underlain by Geotextile Type III	500	SY	\$ 15.00	\$ 7,500.00
d	Concrete Drive Widening	200	SY	\$ 50.00	\$ 10,000.00
2.6	Electrical				
a	Site Electric and Additional Power Center in Existing Motor Control Center	1	LS	\$ 50,000.00	\$ 50,000.00
b	Standby Generator - 200 kW	1	LS	\$ 150,000.00	\$ 150,000.00
2.7	Controls / Instrumentation				
a	DO Probe	2	EA	Included in Item 2.4a	
b	Telemetry RTU for Plant Site	1	LS	Included in Item 2.4a	
c	6" Mag Meter on Influent Force Main	1	LS	\$ 10,000.00	\$ 10,000.00
d	24 Hour Composite, Refrigerated Sampler	1	LS	\$ 10,000.00	\$ 10,000.00
SUBTOTAL CONSTRUCTION COSTS					\$ 2,347,500.00
3	NON-CONSTRUCTION COSTS				
a	Construction Contingency	1	LS	5.00%	\$ 117,375.00
b	Basic Engineering (Note 2)	1	LS	Fixed by Contract	\$ 127,537.46
c	Resident Inspection (Note 2)	1	LS	Fixed by Contract	\$ 106,389.06
Additional Engineering Services					
d	Preliminary / Final Engineering Report	1	LS		\$ 5,000.00
e	Manual Library	1	LS		\$ 2,500.00
f	Upset Engineering Contingency	1	LS		\$ 10,000.00
g	CDBG Administration	1	LS		\$ 50,000.00
h	Legal	1	LS		\$ 2,000.00
i	Geotechnical	1	LS		\$ 20,000.00
j	Environmental	1	LS		\$ 7,000.00
k	Miscellaneous (Public Notice / Legal / Permits)	1	LS		\$ 4,698.48
PROBABLE PROJECT COST					\$ 2,800,000.00

NOTES

1. Includes structural concrete.
2. At RD Rate for a WWTP Project
3. As long as project is within existing fence - no ROW required.

TABLE 35
PRESSURE SEWER OPERATING AND MAINTENANCE
COST OPINION
0-2 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Existing Shelby Gravity Sewer Lines Total Length (LF) = 0 (Total Length) (1 mile/5280 lf) (\$2500/mile/yr) = \$	\$0
Pressure Sewer Lines Total Length (LF) = 19,700 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	Existing Shelby Pressure 148,100 \$7,945
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 876	\$21,900
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 1	Existing Shelby Lift Stations = 5 \$9,000
Main Line Lift Stations = 1 Total HP = 11	Existing Shelby Lift Stations Total HP = 95
Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$31,172
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit # of Units = 1	Existing Shelby # of Units = 5 \$40,500
15% O&M CONTINGENCY	\$16,578
TOTAL O & M COSTS	\$127,094

1. Assume maximum horsepower is used when pumps are running
2. Includes O&M for existing Shelby sewer system

TABLE 36
PRESSURE SEWER OPERATING AND MAINTENANCE
COST OPINION
3-10 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Pressure Sewer Lines Total Length (LF) = 85,800 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	\$4,063
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 678	\$16,950
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 1	\$1,500
Main Line Lift Stations = 1 Total HP = 51 (Note 2) Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$14,998
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit # of Units = 1	\$6,750
15% O&M CONTINGENCY	\$6,639
TOTAL O & M COSTS	\$50,899

1. Assume maximum horsepower is used when pumps are running
2. Includes estimated HP added by upgrade to existing Robinson Creek Lift Station.

TABLE 37
PRESSURE SEWER OPERATING AND MAINTENANCE
COST OPINION
11-20 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Pressure Sewer Lines Total Length (LF) = 148,800 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	\$7,045
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 866	\$21,650
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 3	\$4,500
Main Line Lift Stations = 3 Total HP = 143 (Note 2) Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$42,052
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit # of Units = 1	\$6,750
15% O&M CONTINGENCY	\$12,300
TOTAL O & M COSTS	\$94,298

1. Assume maximum horsepower is used when pumps are running

2. Includes estimated HP added by upgrades to existing Lick Branch and Virgie Stations.

TABLE 38
GRAVITY SEWER OPERATING AND MAINTENANCE
COST OPINION
0-2 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Gravity Sewer Lines Existing Shelby Gravity Total Length (LF) = 13,700 0 (Total Length) (1 mile/5280 lf) (\$500/mile/yr NEW \$2,500 OLD) = \$	\$1,297
Pressure Sewer Lines Existing Shelby Pressure Total Length (LF) = 11,220 148,100 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	\$7,544
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 764	\$19,088
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 1	\$1,500
Main Line Lift Stations = 1 Existing Shelby Lift Stations Total HP = 17 Total HP = 95 Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$32,936
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit Existing Shelby # of Units = 1 # of Units = 5	\$40,500
15% O&M CONTINGENCY	\$15,430
TOTAL O & M COSTS	\$118,294

1. Assume maximum horsepower is used when pumps are running
2. Includes O&M for existing Shelby sewer system

TABLE 39
GRAVITY SEWER OPERATING AND MAINTENANCE
COST OPINION
3-10 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Gravity Sewer Lines Total Length (LF) = 85,800 (Total Length) (1 mile/5280 lf) (\$500/mile/yr) = \$	\$8,125
Pressure Sewer Lines Total Length (LF) = 0 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	\$0
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 170	\$4,238
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 1	\$1,500
Main Line Lift Stations = 1 Total HP = 78 (Note 2) Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$22,938
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit # of Units = 1	\$6,750
15% O&M CONTINGENCY	\$6,533
TOTAL O & M COSTS	\$50,083

1. Assume maximum horsepower is used when pumps are running

2. Includes estimated HP added by upgrades to existing Robinson Creek Lift Station.

TABLE 40
GRAVITY SEWER OPERATING AND MAINTENANCE
COST OPINION
11-20 YEAR PLANNING PERIOD

ITEM	ANNUAL COST
Gravity Sewer Lines Total Length (LF) = 133,940 (Total Length) (1 mile/5280 lf) (\$500/mile/yr) = \$	\$12,684
Pressure Sewer Lines Total Length (LF) = 29,880 (Total Length) (1 mile/5280 lf) (\$250/mile/yr) = \$	\$1,415
Pressure Sewer Grinder Pump Maintenance Assume \$25 per unit per year Total # of Grinders = 217	\$5,413
Lift Station Repairs Assume \$1,500 per year per station Total # of Stations = 3	\$4,500
Main Line Lift Stations = 3 Total HP = 200 (Note 2) Electrical Power Total HP x .746 kW/hp x 12 hr/day x .09\$/kW-hr x 365 day/yr = \$	\$58,815
Lift Station Odor Control (Assume 2, 1500 gallon fills per year @ \$2.25/gal) Assume \$6,750 per year per Unit # of Units = 3	\$20,250
15% O&M CONTINGENCY	\$15,461
TOTAL O & M COSTS	\$118,537

1. Assume maximum horsepower is used when pumps are running

2. Includes estimated HP added by upgrades to existing Lick Creek and Virgie Stations.

TABLE 41
ESTIMATED OPERATION AND MAINTENANCE (O&M) COSTS
EXTENDED AERATION
INITIAL PHASE (0-2 YEARS)

1 LABOR COSTS	
<p>Certified Operator:</p> <p>1 MAN @ \$20/ hr WITH FRINGES</p> <p>52 WKS/YR x 5 DAYS/WK x 8 HR/DAY = 2080 HR/YR</p> <p>1 MAN x \$20/HR x 2,080 HR/YR =</p>	\$41,600
<p>Operator in Training: (One Year)</p> <p>1 MAN @ \$15/ hr WITH FRINGES</p> <p>52 WKS/YR x 5 DAYS/WK x 8 HR/DAY = 2080 HR/YR</p> <p>1 MAN x \$15/HR x 2,080 HR/YR =</p>	\$31,200
<p>Day Labor for Special Events:</p> <p><u>Maintenance and Sludge Press Runs:</u></p> <p>2 MAN @ \$15/ hr WITH FRINGES</p> <p>52 WKS/YR x 1 DAY/WK x 8 HR/DAY = 416 HR/YR</p> <p>2 MAN x \$15/HR x 416 HR/YR =</p>	\$12,480
TOTAL =	\$85,280
2 ELECTRICAL COSTS	
<p>Grinding & Screening @ 5Hp 6 Hr. / Day :</p> <p>5 Hp X 0.7457 KW / Hp X 2190 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =</p>	\$735
<p>Flow Equalization Pumps:</p> <p>2 X 3 Hp X 0.7457 KW / Hp X 2190 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =</p>	\$882
<p>Fixed Media Drain Pumps:</p> <p>2 X 0.5 Hp X 0.7457 KW / Hp X 8760 Hr. / 1 Yr. X \$0.09 / KW Hr. =</p>	\$588
<p>Nine Plant Blowers @ 15 Hp Each 24 Hr. / Day:</p> <p>9 X 15 Hp X 0.7457 KW / Hp X 8760 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =</p>	\$79,368

Three Flow Equalization Blowers @ 7.5 Hp Each 24 Hr. / Day: 3 X 7.5 Hp X 0.7457 KW / Hp X 8760 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$13,228
Three Post Aeration Blowers @ 3 Hp Each 24 Hr. / Day : 3 x 3 Hp X 0.7457 KW / Hp X 8760 Hr. / Yr. X 1 Yr. X \$0.09/ KW Hr. =	\$5,291
UV Disinfection 24 Hr. / Day : 2.7 KW. / Hr. X 8760 Hr. / Yr. X 1 Yr. X \$0.09/ KW Hr. =	\$2,130
RAS / WAS Pump @ 5 Hp 24 Hr. / Day : 5 Hp X 0.7457 KW / Hp X 8760 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$2,940
Plant Service Water Pump @ 1 1/2 Hp 1 Hr. / Day : 1.5 Hp X 0.7457 KW / Hp X 365 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$40
Belt Washwater Pump @ 10 Hp 8 Hr. / Week : 10 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$280
Polymer Feeder @ 1 Hp 8 Hr. / Week : 1 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$30
Belt Filter Press 8 Hr. / Week : 3 Hp X 0.7457 KW / Hp X 416 Hr. / 1 Yr. X \$0.09 / KW Hr. =	\$80
Press Air Compressor 8 Hr. / Week : 2 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$60
Sludge Cake Conveyor 8 Hr. / Week : 3 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$80
Return Pump from Sludge Press @ 5 Hp 8 Hr. / Week : 5 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$140
TOTAL =	\$105,872

3 EQUIPMENT REPLACEMENT / REPAIR COSTS	
Assume repair and maintenance of miscellaneous items - \$10,000 / Yr.	\$10,000
Replace Seals in 8 Submersible Pumps every 20 Yr. : 8 Seals / 20 Yrs. X (\$300 / Seal + \$700 Labor) =	\$400
Replace Mechanical Screen Brush: Every two years @ \$1,000 each =	\$500
Replace Cutter Cartridges in Grinder: Every five years @ \$10,000 each =	\$2,000
Clarifiers: Change Oil in Drive Units Semi-Annually =	\$500
Solids Handling Equipment : Replace Belts in the Press =	\$440
Polymer Costs =	\$4,770
TOTAL =	\$18,610
4 MISCELLANEOUS COSTS / CONSUMABLES	
Third Party Laboratory Testing	
Dry Solids Truck 8 Hr. / Week : 50 Miles / Week X \$1 / Mile X 52 Weeks / Yr. =	\$2,600
UV Lamp replacement : 22 Lamps replaced / Yr. X \$35 / Lamp =	\$770
Fuel for Generator 1000 Gallons / Outage X 2 Outages / Year X \$4 Gallon =	\$8,000
TOTAL =	\$11,370
15 % O&M Contingency =	\$33,170
ANNUAL OPERATION AND MAINTENANCE COST TOTAL =	\$254,301

TABLE 42
ESTIMATED OPERATION AND MAINTENANCE (O&M) COSTS
MEMBRANE BIOREACTOR
INITIAL PHASE (0-2 YEARS)

1 LABOR COSTS	
Certified Operator:	
1 MAN @ \$20/ hr WITH FRINGES	
52 WKS/YR x 5 DAYS/WK x 8 HR/DAY =	2080 HR/YR
1 MAN x \$20/HR x 2,080 HR/YR =	\$41,600
Operator in Training: (One Year)	
1 MAN @ \$15/ hr WITH FRINGES	
52 WKS/YR x 5 DAYS/WK x 8 HR/DAY =	2080 HR/YR
1 MAN x \$15/HR x 2,080 HR/YR =	\$31,200
Day Labor for Special Events:	
<u>Maintenance and Sampling:</u>	
1 MAN @ \$25/ hr WITH FRINGES	
66.2 HR/YR (Per Ovivo)	
1 MAN x \$25/HR x 66.2 HR/YR =	\$1,655
<u>Membrane Cleaning:</u>	
1 MAN @ \$25/ hr WITH FRINGES	
24 HR/YR (Per Ovivo)	
1 MAN x \$25/HR x 24 HR/YR =	\$600
TOTAL =	\$75,055

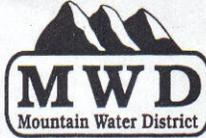
2 ELECTRICAL COSTS

Grinding & Screening @ 5 Hp 6 Hr. / Day : 5 Hp X 0.7457 KW / Hp X 2190 Hr. / Yr. X 1 Yr. X \$0.09 / KW-Hr. =	\$735
Pre Anoxic Mixers: 125.46 KW-Hr. / Day X 365 Days / Yr. X 1 Yr. X \$0.09 / KW-Hr. =	\$4,121
Feed Forward / Traditional Recycle Pump: 197.4 KW-Hrs /Day X 365 Days /Yr. X 1 Yr. X \$0.09 /KW-Hr. =	\$6,485
Pre-Aeration Blower: 83.89 KW-Hrs /Day X 365 Days /Yr. X 1 Yr. X \$0.09 /KW Hr. =	\$2,756
MBR Blower: 473.53 KW-Hrs /Day X 365 Days /Yr. X 1 Yr. X \$0.09 /KW Hr. =	\$15,555
Plant Service Water Pump @ 1 1/2 Hp 1 Hr. / Day : 1.5 Hp X 0.7457 KW / Hp X 365 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$40
Dewatering Box Washwater Pump @ 10 Hp 8 Hr. / Week : 10 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$280
Polymer Feeder @ 1 Hp 8 Hr. / Week : 1 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$30
Return Pump from Dewatering Box @ 5 Hp 8 Hr. / Week : 5 Hp X 0.7457 KW / Hp X 416 Hr. / Yr. X 1 Yr. X \$0.09 / KW Hr. =	\$140
TOTAL =	\$30,142

3 EQUIPMENT REPLACEMENT / REPAIR COSTS	
Assume repair and maintenance of miscellaneous items - \$10,000 / Yr.	\$10,000
Replace Membrane Plate: Annual Sinking Fund (20 year, per Ovivo)	\$5,600
TOTAL =	\$15,600
4 MISCELLANEOUS COSTS / CONSUMABLES	
Third Party Laboratory Testing	
Dry Solids Truck 8 Hr. / Week: 50 Miles / Week X \$1 / Mile X 52 Weeks / Yr. =	\$2,600
UV Lamp replacement: 22 Lamps replaced / Yr. X \$35 / Lamp =	\$770
Fuel for Generator: 1000 Gallons / Outage X 2 Outages / Year X \$4 Gallon =	\$8,000
Sodium Hypochlorite (for Membrane Cleaning): 68 Gal / cleaning X 10.01 lbs / Gal X \$0.10 / lb X 2 cleanings / year	\$136
TOTAL =	\$11,506
15 % O&M Contigency	\$19,845
ANNUAL OPERATION AND MAINTENANCE COST TOTAL =	\$152,149

APPENDIX E

SEWER USE AGREEMENT



**SEWER USER AGREEMENT
FOR PRESSURE SEWER SYSTEM**

Phone No: _____

This agreement entered into between _____,

whose address is _____

hereinafter called "user," and the Mountain Water District, hereinafter called the "District."

WITNESSETH

WHEREAS, the user desires to use the sewer services of the District, and to enter into a sewer users agreement as required by the Bylaws of the District.

NOW THEREFORE, in consideration of the mutual covenants, promises, and agreements herein contained, it is hereby understood and agreed by the parties hereto as follows:

The District shall furnish, subject to the limitations set out in its Bylaws and Rules and Regulations now in force or as hereafter amended, a sewer system in connection with user's occupancy of the following described property:

The user agrees to grant to the District, its successors and assigns, a perpetual easement in, over, through, under, and upon the above described land, with the right to erect, construct, install, and lay, and thereafter use, operate, inspect, repair, maintain, replace, and remove sewer lines and appurtenant facilities, together with the right to utilize adjoining lands belonging to the user for the purpose of ingress to and egress from the above described lands.

The user hereby agrees to connect to the sewer system of the District. The tap-on fee of the sewer system is \$ _____. A State inspection fee payable to the Kentucky State Treasurer of \$ _____ will be charged (residential) at the time of connection (all businesses must obtain permits at the Pike County Health Department).

The user agrees to comply with and be bound by the Bylaws and Rules and Regulations of the District, now in force, or as hereafter duly and legally supplemented, amended or changed. The user also agrees to pay sewer charges at such rates, time and place as shall be determined by the District, and agrees to the imposition of such penalties for noncompliance as are now set out in the District's Bylaws and Rules and Regulations, or which may be hereafter adopted and imposed by the District. The monthly rates will be reasonable and the user shall comply with all rates, rules and regulations of the District, which are approved by the Public Service Commission of Kentucky.

The District shall have final authority on any questions of location of any service line connection to its sewer system, and may shut off water service to a user who allows a connection or extension to be made to such sewer lines for the purpose of supplying sewer service to another user.

The user recognizes that a grinder pump is being installed and accordingly must be aware that foreign objects, which cannot be ground, must not be disposed to the sewer. The District is responsible for the installation and routine maintenance of the grinder pump; however, if after inspection of a problem, it is found that improper items were disposed in the sewer, the user shall be billed for necessary repairs.

User also agrees that the electric service for the grinder pump shall be supplied by the user and will allow the District to connect to their service when the pump is installed.

The user shall install and maintain, at user's expense, service connection lines to the grinder pump on user's property and all other devices necessary to deposit user's sewage into the District's sewer. Service line material and installation must be in accordance with the State Plumbing Code as administered by the Division of Plumbing, Department of Housing, Building and Construction. All and any work on the customer's side shall be inspected by an appropriate representative of the Pike County Health Department before the service line is backfilled. The user shall keep the service line and appurtenances in good working condition at all times and keep any infiltration from entering the service line. The user shall not deposit sewage in such a manner as to cause unusual fluctuations or disturbances to the District's system. The District will use reasonable diligence in supplying sewer service, but shall not be liable for breach of contract in the event of injury, damage to persons or property, or for loss resulting from interruptions in service. The service connection supplied by the District for the user has a definite capacity, and no addition to the equipment or load connected thereto will be allowed except by consent of the District. Failure to give notice of additions or changes in load and to obtain the District's consent for same, shall render the user liable for any damage to the District's lines or equipment caused by the additional or changed installation.

The user shall connect sewer service lines to the District's Collection System and shall commence to use sewer services of the system on the date the sewer collection line is made available to the user by the District. Sewer user charges to the user shall commence on the date service is made available, regardless of whether the user connects to the system.

It is mutually understood and agreed that the failure to pay sewer service charges duly imposed shall result in the automatic imposition of the following penalties:

1. Non-payment by the due date will be subject to a penalty of five (5%) percent of the delinquent amount.
2. Non-payment within thirty days from the due date will result in the water being shut off from the user's property.
3. In the event it becomes necessary for the District to shut off the water from a user's property, a fee of \$ 25.00 will be charged for reconnection of the service. The user will also be required to pay all delinquent accounts in full, unless otherwise agreed to in writing.

If the sewer system is constructed, and the user's property covered by the Agreement is not reached by the District's sewer line, the connection fee will be fully refunded to the user. Construction of sewer lines to serve the property covered under this Agreement depends upon feasibility, availability of funds for construction, and approval of all local, state, and federal agencies having jurisdiction over this type of facility.

THE DISTRICT DOES NOT GUARANTEE SEWER SERVICE TO THE USER.

IN WITNESS WHEREOF, we have executed this agreement this the _____ day of _____, 20____.

USER _____

BY: _____

(For Mountain Water District)

APPENDIX F

SIGNED ORDINANCE APPROVING THE
LOWER SHELBY 201 FACILITIES PLAN

APPENDIX G

SIGNED ORDINANCE DEFINING THE CREATION AND LEGAL
STANDING OF THE MOUNTAIN WATER DISTRICT



Pike County
Office Of County Judge/Executive

Pike County Courthouse - Main Street - Pikeville, Kentucky 41501

Paul E. Patton

606-432-6247

December 18, 1985

Forrest M. Skaggs, Secretary
Kentucky Public Service Commission
Post Office Box 615
Frankfort, Kentucky 40602

Dear Mr. Skaggs:

~~Under the provisions of KRS 74.363 four existing water districts~~
in Pike County wish to merge into a single water district. It is the desire of the Pike County Fiscal Court that, insofar as possible, the county shall be made into one county wide water district. This letter is Pike County's and the existing water districts request for the Public Service Commission's assistance in accomplishing this goal.

Attached are resolutions from the Pike County Fiscal Court, Marrowbone Creek Water District, Shelby Valley Water District, Pond Creek Water District and John's Creek Water District supporting this merger request. Maps of the boundaries of the aforementioned districts are on file in your office. Also attached is a county map depicting the existing water districts along with those areas of Pike County not presently included in a water district. Areas of the County not to be included are shown on the map - exceptions are the service areas of the cities of Pikeville and Elkhorn City and the Sandy Valley Water District which covers parts of both Pike and Floyd Counties.

Bonds on assets of merging districts are held by the Economic Development Administration and the Farmers Home Administration. Separate letters are being sent to these agencies requesting their assistance and concurrence in the merger.

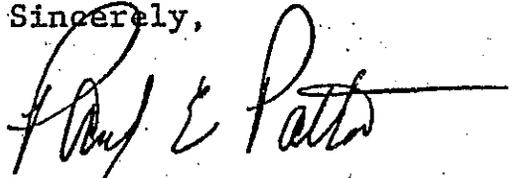
It is understood that this merger at times may become complicated. Mr. Ernest Chaney, Director of Federal Grants for Pike County and Chairman of the Board of Mountain Utility Management Corporation which currently operates all of the districts will act as coordinator between local and state/federal activities.

Mr. Skaggs, Secretary

Mr. Douglas Griffin of KENVIRONS is available for technical engineering coordination. Please contact either of these individuals for needed information.

Your assistance in creating a Pike County Water District is most welcome.

Sincerely,

A handwritten signature in cursive script, appearing to read "Paul E. Patton", with a horizontal line extending to the right from the end of the signature.

PAUL E. PATTON
Pike County Judge/Executive

ORDER OF THE PIKE COUNTY FISCAL COURT

October 7, 1985

Order No.: 10-07-85.004

IN RE: RESOLUTION TO PUBLIC SERVICE COMMISSION
REGARDING PIKE COUNTY WATER DISTRICTS

Upon motion of Magistrate Randy Smith and seconded by Magistrate Cowan Ratliff, the PIKE COUNTY FISCAL COURT HEREBY APPROVES a resolution from the Court to the Public Service Commission and said resolution is to request that the Shelby Valley Water District, the Pond Creek Water District, the Marrowbone Water District, the Johns Creek Water District, and all other areas of Pike County not presently included in a water district be included and combined into one water district.

VOTE TAKEN AS FOLLOWS:

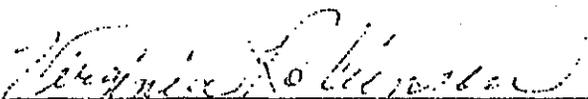
Magistrate Paul W. Chaney	Yes
Magistrate Ken Damron	Yes
Judge Paul E. Patton	Yes
Magistrate Cowan Ratliff	Yes
Magistrate Randy Smith	Yes

MOTION CARRIED.



PIKE COUNTY FISCAL COURT BY AND THROUGH
COUNTY JUDGE/EXECUTIVE PAUL E. PATTON

ATTEST:



Fiscal Court Clerk

RESOLUTION OF THE POND CREEK WATER DISTRICT OF PIKE COUNTY,
KENTUCKY TO MERGE INTO A COUNTY-WIDE WATER DISTRICT

BE IT RESOLVED, that pending approval of the Public Service Commission and the Farmers Home Administration, Pond Creek Water District would be willing to merge into a county-wide district

This Resolution was adopted at the regular monthly meeting held Tuesday, December 10, 1985 in the Belfry Courthouse. The motion was made by Nick England and was seconded by Rudy Poliss. All three Commissioners voted in favor.

B. L. French
(Chairman)

Nick A. England Jr.
(Secretary-Treasurer)

By unanimous agreement of the Commissioners, the following resolutions were adopted.

85-09.01 RESOLVED FURTHER that the Commissioners of Marrowbone Creek Water District support the county wide water district and would ask Pike County Fiscal Court to take whatever action necessary to assist in creating one water district for Pike County.

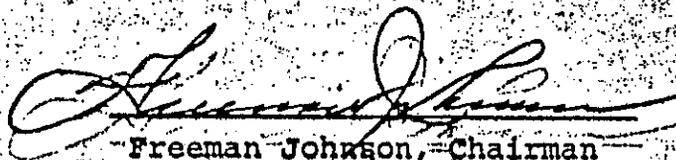
Carl Hens Johnson
Chairman

Ray Bevens acting Sec.
Secretary-Treasurer

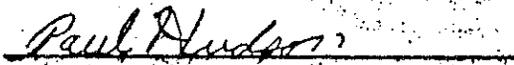
Shelby Valley Water District

We, the Shelby Valley Water District of Robinson Creek, Kentucky, do agree on this day, Nov. 11th, 1985, to a merger with the Pike County Water District according to the recommendation of Vernon Brown and also upon approval of the Public Service Commission.

Final details to be worked out upon approval as stated above.



Freeman Johnson, Chairman
Freeman Johnson, Chairman



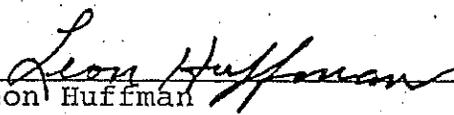
Paul Hudson, Secretary
Paul Hudson, Secretary

Toni Akers made a motion to accept the merger as stated above and Paul Hudson seconded the motion.

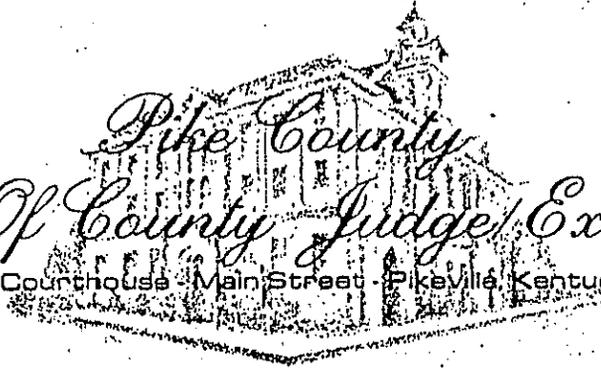
JOHNS CREEK WATER DISTRICT

By unanimous agreement of the Commissioners, the following resolution was adopted.

85-09.01 RESOLVED FURTHER that the Commissioners of The Johns Creek Water District support the county wide water district and would ask The Pike County Fiscal Court to take whatever action necessary to assist in creating one water district for Pike County.



Leon Huffman
Chairman



Pike County
Office Of County Judge/Executive

Pike County Courthouse Main Street Pikeville, Kentucky 41501

Paul E. Patton

606-432-6247

December 18, 1985

Forrest M. Skaggs, Secretary
Kentucky Public Service Commission
Post Office Box 615
Frankfort, Kentucky 40602

Dear Mr. Skaggs:

Under the provisions of KRS 74.363 four existing water districts in Pike County wish to merge into a single water district. It is the desire of the Pike County Fiscal Court that, insofar as possible, the county shall be made into one county wide water district. This letter is Pike County's and the existing water districts request for the Public Service Commission's assistance in accomplishing this goal.

Attached are resolutions from the Pike County Fiscal Court, Marrowbone Creek Water District, Shelby Valley Water District, Pond Creek Water District and John's Creek Water District supporting this merger request. Maps of the boundaries of the aforementioned districts are on file in your office. Also attached is a county map depicting the existing water districts along with those areas of Pike County not presently included in a water district. Areas of the County not to be included are shown on the map - exceptions are the service areas of the cities of Pikeville and Elkhorn City and the Sandy Valley Water District which covers parts of both Pike and Floyd Counties.

Bonds on assets of merging districts are held by the Economic Development Administration and the Farmers Home Administration. Separate letters are being sent to these agencies requesting their assistance and concurrence in the merger.

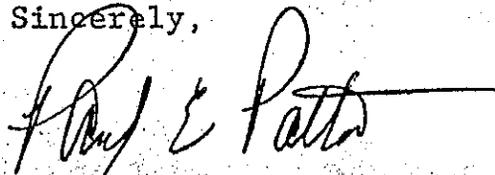
It is understood that this merger at times may become complicated. Mr. Ernest Chaney, Director of Federal Grants for Pike County and Chairman of the Board of Mountain Utility Management Corporation which currently operates all of the districts will act as coordinator between local and state/federal activities.

Mr. Skaggs, Secretary

Mr. Douglas Griffin of KENVIRONS is available for technical engineering coordination. Please contact either of these individuals for needed information.

Your assistance in creating a Pike County Water District is most welcome.

Sincerely,

A handwritten signature in cursive script, reading "Paul E. Patton", with a horizontal line extending to the right from the end of the signature.

PAUL E. PATTON
Pike County Judge/Executive

ORDER OF THE PIKE COUNTY FISCAL COURT

October 7, 1985

Order No.: 10-07-85.004

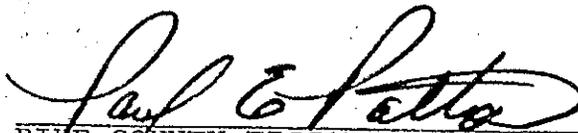
IN RE: RESOLUTION TO PUBLIC SERVICE COMMISSION
REGARDING PIKE COUNTY WATER DISTRICTS

Upon motion of Magistrate Randy Smith and seconded by Magistrate Cowan Ratliff, the PIKE COUNTY FISCAL COURT HEREBY APPROVES a resolution from the Court to the Public Service Commission and said resolution is to request that the Shelby Valley Water District, the Pond Creek Water District, the Marrowbone Water District, the Johns Creek Water District, and all other areas of Pike County not presently included in a water district be included and combined into one water district.

VOTE TAKEN AS FOLLOWS:

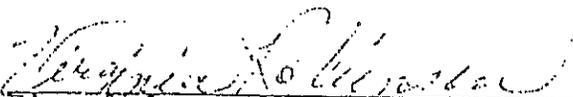
Magistrate Paul W. Chaney	Yes
Magistrate Ken Damron	Yes
Judge Paul E. Patton	Yes
Magistrate Cowan Ratliff	Yes
Magistrate Randy Smith	Yes

MOTION CARRIED.



PIKE COUNTY FISCAL COURT BY AND THROUGH
COUNTY JUDGE/EXECUTIVE PAUL E. PATTON

ATTEST:



Fiscal Court Clerk



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

January 30, 1986

Honorable Paul E. Patton
Pike County Judge/Executive
Pike County Courthouse
Main Street
Pikeville, Kentucky 41501

Re: Case No. 9499

Dear Judge Patton:

We are in receipt of your Application requesting Commission approval to merge several water districts in Pike County, Kentucky, into a single case. The Application was date-stamped received on January 24, 1986, and has been assigned Case No. 9499. In all future correspondence or filings made in connection with this case, please reference this case number.

The Commission wishes to express its appreciation to your efforts in seeking the merger. We do believe that merger is often the best solution to many small rural water problems. Our staff will quickly proceed with its initial investigation and after issuing its Report, will conduct a public hearing. Mr. Eddie B. Smith, our Chief Water Engineer, will be coordinating our investigation. Feel free to contact him at (502) 564-4302 or myself at (502) 564-2473 if you need any information.

Sincerely,

Forest M. Skaggs
Secretary

FMS:lb

cc: Honorable Pamela Johnson, Assistant Attorney General
Douglas Griffin, Kenvirons
Earl Gene Johnson, Chairman, Marrowbone Creek Water District
Freeman Johnson, Chairman, Shelby Valley Water District
Bill Fouch, Chairman, Pond Creek Water District
Leon Huffman, Chairman, Johns Creek Water District



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

April 17, 1986

Honorable Paul E. Patton, Pike County Judge Executive, Pike
County Courthouse, Main Street, Pikeville, Kentucky 41501
Mr. Earl Gene Johnson, Chairman, Marrowbone Creek Water
District, P. O. Box 82, Regina, Kentucky 41559
Mr. Freeman Johnson, Chairman, Shelby Valley Water District,
P. O. Box 1200, Robinson Creek, Kentucky 41560
Mr. Bill Fouch, Chairman, Pond Creek Water District,
P. O. Box 129, Belfry, Kentucky 41514
Mr. Leon Huffman, Chairman, John's Creek Water District,
c/o Kentucky Power Company, Box 3158, Pikeville, KY 41501

Re: Case No. 9499
Pike County Water Districts
Merger

Gentlemen:

We enclose one attested copy of the Commission's Order
in the above case.

Very truly yours,

PUBLIC SERVICE COMMISSION

Forest M. Skaggs

Forest M. Skaggs
Secretary

FMS/cbg

Enclosure

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

* * * * *

In the Matter of:

APPLICATION OF MARROWBONE CREEK)
WATER DISTRICT, SHELBY VALLEY)
WATER DISTRICT, POND CREEK WATER) CASE NO. 9499
DISTRICT AND JOHN'S CREEK WATER)
DISTRICT)

O R D E R

On January 24, 1986, the Commission received from the Pike County Fiscal Court a request for Commission assistance to accomplish the merger of existing water districts into a county-wide water system. Attached to this request were resolutions from the Marrowbone Creek, Shelby Valley, Pond Creek and John's Creek Water Districts. On January 30, 1986, the Commission established this case to begin its investigation. In order to facilitate the Commission's review, the water districts should promptly furnish the information requested below.

IT IS THEREFORE ORDERED that:

Marrowbone Creek Water District, Shelby Valley Water District, Pond Creek Water District, and John's Creek Water District shall file an original and 3 copies of the following information, as each pertains to its own district, with the Commission by May 19, 1986.

1. Provide copies of all debt obligations of each district, including copies of each bond ordinance, indenture, and loan agreement.

2. Provide a list of the holder of each debt of the districts and the name and address of the agent to whom payments are made. In addition, the list shall state the outstanding amount due, the final retirement date, and the present payment status of each debt.

3. Provide a copy of audit performed by an independent CPA, or by the auditor of public accounts, as provided by KRS 65.065.

4. Provide copies of all County Judge or Fiscal Court Orders establishing each district and defining its boundaries.

IT IS FURTHER ORDERED that:

John's Creek shall state whether it provides water service to any customers, whether it operates any facilities, or whether it has any employees.

IT IS FURTHER ORDERED that:

Shelby Valley shall provide a billing analysis in the manner illustrated by the example in Exhibit A.

IT IS FURTHER ORDERED that:

The Districts shall file a joint report with the Commission outlining the proposed schedule of events regarding the merger. The report shall include the dates of any proposed construction, the date and manner of any proposed debt consolidation, the date of any proposed boundary modification or adjustment, and an opinion by a recognized bond counsel as to the most expedient manner of

effecting an acceptable merger under the conditions of the existing bond ordinances of all four district.

Done at Frankfort, Kentucky, this 17th day of April, 1986.

By the Commission

ATTEST:

Forest M. Skaggs
Secretary

EXHIBIT A

1. Using tally marks, record the usage shown on each bill in the appropriate usage level on the tally sheet. Usage from 0-100 gallons would be recorded in the 100 level; from 101-200 gallons in the 200 level, etc.
2. When this is completed, count the tally marks. This would represent the number of bills at each level.
3. Multiply the usage level by the number of bills (100 gallons x 25 bills) to arrive at the total usage at each level.
4. Divide the usage and bills into sections that coincide with present and/or proposed rate schedule (1st 2000 gallons, next 2000 gallons, next 2000 gallons, next 44,000 gallons, etc.)
5. Add the bills and usage in each section and enter the totals in columns 2 and 3, respectively, of the "usage table by rate increment."

Once these initial steps are done, I believe you will be able to complete the billing analysis according to the instructions contained in the enclosure titled "Billing Analysis."

BILLING ANALYSIS

The billing analysis is the chart reflecting the usage by the customers as well as the revenue generated by a specific level of rates. A billing analysis of both the current and proposed rates is mandatory for analysis of a rate filing. The following is a step-by-step description which may be used to complete the billing analysis. A completed sample of a billing analysis is also included.

a. Usage Table (Usage by Rate Increment)

Information needed to complete the usage table should be obtained from the meter books or other available usage records. The usage table is used to spread total usage into the proper incremental rate step. Initial recording of usage should be in 100 gallon increments. Where there are only a few very large users or contract customers, actual usage should be used. Usage between 0-100 gallons should be shown as 100, between 101-200 as 200, etc. The usages and customers are then combined for purposes of the usage table as follows:

Column No. 1 is the incremental steps in the present or proposed rate schedule for which the analysis is being made. Column No. 2 is the number of bills in each incremental rate step. Column No. 3 is the total gallons used in each incremental rate step. Columns Nos. 4, 5, 6, 7, 8 and 9 are labeled to correspond to the incremental rate steps shown in Column No. 1 and contains the actual number of gallons used in each incremental rate step.

Example for completing Usage Table is as follows:

Column No. 1 is incremental rate steps.

Columns No. 2 and 3 are completed by using information obtained from usage records.

Columns No. 4, 5, 6, 7, 8, and 9 are completed by the following steps:

Step 1: 1st 2,000 gallons minimum bill rate level
432 Bills
518,400 gallons used
All bills use 2,000 gallons or less,
therefore, all usage is recorded in
Column 4.

- Step 2: Next 3,000 gallons rate level
 1,735 Bills
 4,858,000 gallons used
 1st 2,000 minimum x 1,735 bills = 3,470,000
 gallons - record in Column 4
 Next 3,000 gallons - remainder of water over
 2,000 = 1,388,000 - record in Column 5
- Step 3: Next 10,000 gallons rate level
 1,830 Bills
 16,268,700 gallons used
 1st 2,000 minimum x 1,830 bills = 3,660,000
 gallons - record in Column 4
 Next 3,000 gallons x 1,830 bills = 5,490,000
 gallons - record in Column 5
 Next 10,000 gallons - remainder of water over
 3,000 = 7,118,700 gallons - record in
 Column 6
- Step 4: Next 25,000 gallons rate level
 650 bills
 15,275,000 gallons used
 1st 2,000 minimum x 650 bills = 1,300,000
 gallons record in Column 4
 Next 3,000 gallons x 650 bills = 1,950,000
 gallons record in Column 5
 Next 10,000 gallons x 650 bills = 6,500,000
 gallons - record in Column 6
 Next 25,000 gallons - remainder of water over
 10,000 gallons = 5,525,000 gallons - record
 in Column 7
- Step 5: Over 40,000 gallons rate level
 153 bills
 9,975,600 gallons used
 1st 2,000 minimum x 153 bills = 306,000
 gallons - record in Column 4
 Next 3,000 gallons x 153 bills = 459,000
 gallons - record in Column 5
 Next 10,000 gallons x 153 bills = 1,530,000
 gallons - record in Column 6
 Next 25,000 gallons x 153 bills = 3,825,000
 gallons - record in Column 7
 Over 40,000 gallons - remainder of water over
 25,000 = 3,855,600 gallons - record in
 Column 8
- Step 6: Total each column for transfer to Revenue
 Table.

b. Revenue Table (Revenue by Rate Increment)

Revenue Table is used to determine the revenue produced from the Usage Table. Column No. 1 is the incremental rate steps in the rate schedule for which the analysis is being made. Column No. 2 indicates the total number of bills. Column No. 3 is the number of gallons accumulated in each rate increment (Totals from Columns 4, 5, 6, 7 and 8 of the above usage table). Column No. 4 is the rates to be used in determining revenue. Column No. 5 contains revenue produced.

Example for completing Revenue Table is as follows:

Complete Columns no. 1, 2 and 3 using information from Usage Table.

Complete Column No. 4 using rate either present or proposed.

Column No. 5 is completed by first multiplying the bills times the minimum charge.

Then, starting with the second rate increment, multiply Column No. 3 by Column No. 4 and total.

Revenue from Present/Proposed Rates

Test Period from 1-1-81 to 12-31-81

USAGE TABLE
Usage by Rate Increment

Residential	(1)	(2) Bills	(3) Gallons/MCF	(4) Next					(8) Over 40,000	(9) Total
				2,000	3,000	10,000	25,000	40,000		
000: Minimum Bill	432	518,400	1,388,000					4,850		
000 Gallons	1,735	3,470,000	5,490,000	7,118,700				16,268		
000 Gallons	1,830	3,660,000	1,950,000	6,500,000	5,525,000			15,275		
000 Gallons	650	1,300,000	459,000	1,530,000	3,825,000			9,975		
000 Gallons	153	306,000								
Total	4,800	46,895,700	9,287,000	15,148,700	9,350,000	3,855,600		46,895		

REVENUE TABLE

Revenue By Rate Increment

(1)	(2) Bills	(3) Gallons/MCF	(4)		(5) Revenue
			Rate	Revenue	
000: Minimum Bill	4,800	9,254,400	\$5.00 Min.	\$24,000.00	
000 Gallons		9,287,000	2.50	23,217.50	
000 Gallons		15,148,700	2.00	30,297.40	
000 Gallons		9,350,000	1.25	11,687.50	
000 Gallons		3,855,600	.75	2,891.70	
Total				\$92,094.10	Total Revenue



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

CERTIFICATE OF SERVICE

Re: Case No. 9499
Pike County Water Districts Merger

I, Susan Hutcherson, Acting Secretary of the Public Service Commission, do hereby certify that the enclosed attested copy of the Commission's Order in the above case was served upon the following, by U.S. Mail, on this 27th day of June, 1986.

Parties of Record:

Honorable Paul E. Patton
Mr. Earl Gene Johnson
Mr. Freeman Johnson
Mr. Bill Fouch
Mr. Leon Huffman

Susan Hutcherson
Acting Secretary

SH/cbg

Enclosure

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION FOR APPROVAL OF MERGER)
BETWEEN MARROWBONE CREEK WATER)
DISTRICT, SHELBY VALLEY WATER) CASE NO. 9499
DISTRICT, POND CREEK WATER DISTRICT)
AND JOHN'S CREEK WATER DISTRICT)

O R D E R

On January 24, 1986, the Commission received from the Pike County Fiscal Court a request for Commission assistance to accomplish the merger of existing water districts into a county-wide water system. The Commission has treated this filing as an application by the four water districts involved for approval of their intended merger. The request included resolutions from the Marrowbone Creek, Shelby Valley, Pond Creek and John's Creek Water Districts. On April 17, 1986, the Commission ordered the Districts to provide additional information in order to evaluate their request.

FINDINGS AND ORDERS

The Commission, after consideration of the intent of KRS 74.361 and KRS 74.363, is of the opinion and finds that:

1. KRS 74.363 establishes a statutory basis for merger, and sets forth the method of merger. It states in part, "water

districts may by concurrent action and by approval of a majority of the membership of the board of each merge their districts into one."

2. Section (1) of KRS 74.361 establishes a statutory basis for merger and sets forth the purposes of merger. It states in part:

The General Assembly of the Commonwealth of Kentucky determines as a legislative finding of fact that reduction of the number of operating water districts in the Commonwealth will be in the public interest, in that merger of such districts will tend to eliminate wasteful duplication of costs and efforts, result in a sounder and more businesslike degree of management, and ultimately result in greater economies, less cost, and a higher degree of service to the general public; and that the public policy favors the merger of water districts wherever feasible.

3. KRS 74.363 establishes the responsibility for retiring the debts of a merged water district. It states in part:

Bonded obligations. . . shall continue to be retired. . . from funds collected over the same area. . . until all bonded obligations of the old district have been retired.

The districts have made it known to the Commission that they anticipate having a debt retirement plan finalized by June 30, 1986.

4. The water districts of Pike County should be merged under a name that is descriptive of its purpose and that is distinct from the name of any existing utility or organization. The name of the merged district should be the Mountain Water District.

5. The Mountain Water District should petition the County Judge/Executive of Pike County for definition of the territorial limits of the District, to include all of the territory now covered by the merging districts.

IT IS THEREFORE ORDERED that

1. Marrowbone Creek Water District, Shelby Valley Water District, Pond Creek Water District, and John's Creek Water District shall be merged as of June 30, 1986. As of that date, the above four water districts shall operate as one district under the name "Mountain Water District."

2. The District shall submit to the Commission by July 11, 1986, a schedule of events describing the refinancing plan for the District's debts. This schedule shall be updated quarterly and submitted to the Commission until such time as the debt retirement plan is fully implemented.

3. The water districts of Pike County shall continue the work essential to accomplishment of the merger. All aspects of the merger, including those set out by the Findings herein shall be accomplished within a reasonable time, following the effective merger date of June 30, 1986.

4. All parties of interest are advised that additional Orders may be required to address situations specific to the merging of the Pike County water districts.

Done at Frankfort, Kentucky, this 27th day of June, 1986.

By the Commission

ATTEST:

Susan Hutcherson
Acting Secretary

MINUTES OF MEETING OF THE COMMISSION
OF MOUNTAIN WATER DISTRICT

HELD JULY 3, 1986

An organizational meeting of the Commission of Mountain Water District of Pike County was held at 1 o'clock P.M. DST, July 3, 1986 at the office at Winns Branch.

A quorum of duly appointed Commissioners from the old water districts were present. Those present were Earl Gene Johnson, Ray Bevins, Paul Hudson, Freeman Johnson, Toni Akers, Leon Huffman, Bob Justice, Rudy Pollis, Ernest R. Chaney, Doug Woods, Doug Griffin, Deloris Cauley and Jim Vanover.

Ernest Chaney began by talking about the Public Service Commission Order #9499 merging the Marrowbone Creek Water District, Shelby Valley Water District, Pond Creek Water District and Johns Creek Water District as of 30, June 1986, and will operate as Mountain Water District. The new district shall submit to the Commission by 11 July, 1986 a schedule of events describing the refinancing plan of Districts debts. This will be updated quarterly and submitted to the Public Service Commission until such time as the debt retirement plan is fully implemented.

The water districts of Pike County shall continue the work essential to accomplishment of the merger. All aspects of the merger, including those set out by the Findings herein shall be accomplished within a reasonable term, following the effective merger date of June 30, 1986.

All parties of interest are advised that additional Orders may be required to address situations specific to the merging of the Pike County Water Districts.

This order as far as Public Service Commission is concerned, the separate water district of Pike County ceased to be. All commissioners are now commissioners of the Mountain Water District. We are starting from scratch as of today.

The agenda that we have is a list of items that we need to discuss today and there will be other items to go into later.

The first item is to get a list of Commissioners present and state of term.

We need to elect the new Chairman, Secretary and a Treasurer for the New Mountain Water District.

Paul Hudson made the motion to nominate Freeman Johnson as Chairman, Toni Akers seconded. Rudy Pollis made the motion to nominate Leon Huffman as Chairman, Bob Justice seconded. The vote was taken by show of hands. Leon Huffman had four votes. Freeman Johnson had three votes. Leon Huffman was elected chairman and the meeting was turned over to Leon Huffman.

Leon Huffman then went on to hear a motion for secretary. Rudy Pollis nominated Toni Akers for secretary. Paul Hudson seconded. Vote was unanimous.

Leon Huffman then accepted Rudy Pollis's nomination for Freeman Johnson as treasurer. Tonie Akers seconded. Vote was unanimous.

It was discussed that the Commissioners may need Fidelity Bonds, and the Treasurer will have to be bonded seperatley.

Leon Huffman asked Jim Vanover to tell us how to resolve and assume all assets, liabilities, and transfer titles of all water districts. He went on to say that a resolution would be passed and the guide lines for this is governed by statute, The Statute states that the new water districts assumes all assets and liabilities of each water district.

The motion was made by Ray Bevins that the Mountain Water District, in accordance with KRS74.363 hereby accepts all assets and liabilities of the four (4) water districts joining in the merger, and shall have to assume all assets and liabilities, including equipment and real property, transferred into the name Mountain Water district.

Rudy Pollis seconded. Vote was unanimous.

Each of the four (4) water districts will have to pass a resolution to transfer ownership and title of all assets of their district, both real, personal, tangible, to the Mountain Water District in accordance with Chapter 74 of the Kentucky Revised Statutes.

Leon Huffman next discussed hiring an attorney, engineer, and an accountant subject to the approval of the Pike County Fiscal Court. The motion was made by Paul Hudson to hire Jim Vanover as the attorney temporarily for Mountain Water District except, where on going contracts already exist. To hire Doug Griffin, Kenirvons, Inc., as our engineer. To hire John Tackett, CPA, for consolitation for ninety day or sufficient time to complete accounting necessary for merger and close out the books of old water districts with the exception of Pond Creek until their problem is resolved. Rudy Pollis seconded. Vote was unanimous.

The next item on the agenda is to create a General Manager position. Leon Huffman suggest that this be discussed later in the meeting.

Leon Huffman next discussed establishing new bank accounts for Mountain Water District and what to do about exisiting bank accounts for the four (4) districts. The motion was made by Earl Gene Johnson that each of the four (4) water districts write a check to Mountain Water District for the balance in their operating accounts as of June 30, 1986. The money is to be deposited in the new Mountain Water District operation account to be started at the Pikeville National Bank. There will be two signatures on each check written. The authorized signatures will be Leon Huffam, Freeman Johnson, Treasure, and Toni Akers. Freeman Johnson seconded. Vote was unanimous.

At a later date we will set up a bank account for paying bond indebttness for each water area, surcharge and construction account.

Leon Huffman asked Jim Vanover to get the Corporate Book and Seal for Mountain Water District.

Leon Huffman went on to discuss the boundaies of the Mountain Water District and writing the letter to Public Service Commission about petitioning the Pike County Fiscal court to transfer the water districts to Mountain Water district, this will be done according to the statutes. The motion was made by Freeman Johnson, to let Jim Vanover and Doug Griffin prepare the petition for the court and draw up the new boundarie lines. Paul Hudson seconded. Vote was unanimous.

Leon Huffman then discussed the position of General Manager. He would be directly responsible to the Commissioners for overseeing the running of the new water district. He will need to have contact with all funding agencies on contracts for the expansion on Marrowbone,(Grapevine). This will include SDBG, Farmens Home Administration and all AML projects. This needs to be done as soon as possible so that there will be no problems in the transition and to eventually have water lines wherever possible in Pike County. The motion was made by Ray Bevins to create the position of General Manager and to hire Ernest Chaney part time on a Contract basis at \$1,000.00 per month for 30 days subject to extension by the Commissioners. Paul Hudson seconded. Vote was unanimous.

Leon then discussed the Rules and Regulations set by Public Service Commission for each water district. It was decided that the Commissioners should read the rules and regulations from each one and from these set up the rules by which the new Mountain Water District will follow.

Also, that we should write our own Personal Code and include a dress code for employees. The commissioners wanted each employee to have an identification card.

Leon the discussed the statute of Mountain Utility Management Corporation. Their Commissioners need to pass a resolution whereby all assets and liabilities will be transfered to Mountain Water District. Pertaing to the employees Jim Vanover suggested that they submit resignation to Mountain Utility Management Corporation and then the Mountain Water District will hire them by vote. Adecision would need to be made about vacation and sick leave.

Also, need to decide what to do with the existing contracts on water waste. (Eastern Coal and Pike County). The discussion was whether to let Mountain Water District contract with Mountain Utility Management Corporation to do all of their work as before or change to MWD. This will be left as is until we have a chance to notify the customers and make contract changes.

As soon as possible we need to write a letter to inform all the vendors of the merger of the water districts and Mountain Utility Management Corporation.

In future we should bid our insurance, all the parts, pipe, etc. and printing that will be needed.

Leon Huffman discussed the need to advertise for an Engineer, CPA and a consultant. It was suggested we do this as soon as possible. Paul Hudson made the motion to advertise for these. Ray Bevins seconded.

Leon Huffman discussed the fate of Mountain Utility Management Corporation. Ernie Chaney asked if the Commissioners wanted to keep Mountain Utility Management Corporation and have Mountain Water District contract with them to operate the water areas and keep the employees as they are. If you do this you still have the same problems. Ernie suggested that all assets and liabilities be transferred to Mountain Water District. For the time Mountain Utility Management Corporation should be left as is, and in the future Mountain Water District may want to use it to do some contract work. The by-laws of Mountain Utility Management Corporation should be changed so that the Commissioners will be the same as the ones on Mountain Water District.

Ray Bevins made the motion for Deloris to order office supplies as needed for the Mountain Water District. Paul Hudson seconded. Vote was unanimous.

Ray Bevins made the motion that Mountain Water District adjourn subject to recall. Toni Akers seconded. Vote was unanimous.

RESOLUTION 86.1 OF THE MOUNTAIN WATER DISTRICT
ACCEPTANCE ASSETS AND LIABILITIES OF CONSOLIDATING WATER DISTRICTS

Whereas, the Public Service Commission has approved the merger of the Marrowbone Creek, Shelby Valley, Pond Creek, and Johns Creek Water Districts into a single water district designated as the Mountain Water District; and

Whereas the newly-created water district has specific statutory duties;

Now, therefore, be it resolved:

That the Mountain Water District, in accordance with KRS 74.363 hereby accepts all assets and legal liabilities of the four(4) water districts joining in the merger, and shall have title to all assets, including equipment and real property, transferred into the name Mountain Water District.

This 3 day of July, 1986

Leon Huffman
Leon Huffman, Chairman

Attest:

Toni Akers
Toni Akers, Secretary

The foregoing Minutes were then read by the Secretary, and no corrections being found necessary, it was moved, seconded and unanimously carried that they be approved as read and ordered signed as approved by law.

There being no further business to come before the meeting, it was moved, seconded and unanimously carried that the meeting be adjourned.

MOUNTAIN WATER DISTRICT

By: Leon Huffman
Leon Huffman
Chairman

Toni Akers
Toni Akers
Secretary



Mountain Water District

Post Office Box 1469
Pikeville, Kentucky 41501
606-631-9162



January 30, 1987

To Whom It May Concern:

The following documents are attached and constitute legal authority for Mountain Water District and its duly authorized representatives to conduct business, control assets, and assume liabilities of the former Marrowbone Creek, Shelby Valley, Johns Creek and Pond Creek Water District:

1. Petitions from the above mentioned districts and the Pike County Fiscal Court to the Kentucky Public Service Commission asking that said water districts be merged.
2. Kentucky PSC order approving the merger to be known as the Mountain Water District.
3. Resolutions by the districts transferring all assets and liabilities to Mountain Water District.
4. Minutes of the organizational meeting of Mountain Water District.
5. Resolution of Mountain Water District accepting all assets and liabilities of merged districts.
6. Pike County Judge/Executive order setting boundaries of Mountain Water District