



SUMMIT ENGINEERING, INC.
CIVIL ENGINEERING

Belfry/Pond Creek Sewer Project

Belfry, Kentucky
(SX21195692)

Preliminary Engineering Report

September 12, 2013

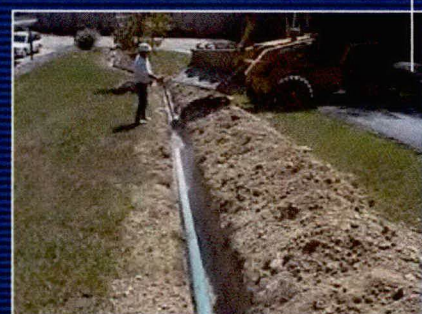
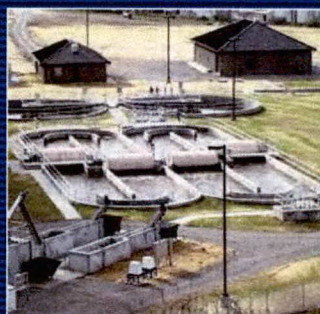
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CIVIL ENGINEERING MINING ENGINEERING ENVIRONMENTAL
ENGINEERING ARCHITECTURE SURVEYING

Belfry / Pond Creek Sewer Project (SX21195692)
Preliminary Engineering Report

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ITEM 1 – GENERAL

The Mountain Water District seeks to fund and construct a new wastewater treatment plant and collection system in the Belfry area of Pike County. The proposed extended aeration treatment plant will be located at Pegs Branch and will have an ultimate capacity of 400,000 GPD. The collection lines will extend along U.S. 119 north and south of the plant to serve the greater Pond Creek area. Existing lines feeding into the Williamson, West Virginia WWTP will ultimately be redirected to the proposed plant.

Supporting exhibits are provided at the end of this report. A general project location map depicting the location of the proposed project within the Pond Creek 201 Facilities Plan area is provided as **Exhibit A**. The Engineer's Opinion of Probable Project Cost for each design alternate is presented as **Exhibit C**.

ITEM 2 – PROJECT PLANNING AREA

The project is located within the Pond Creek 201 Facilities Plan area, as shown on **Exhibit A**. The Facilities Plan creates 13 service areas to be constructed over a 20-year period. The total number of customers projected by the Facilities Plan is approximately 2,500.

ITEM 3 – EXISTING FACILITIES

Portions of the Belfry / South Williamson area are currently served by the Williamson Wastewater Treatment Plant. This includes South Williamson, Forest Hills, Belfry High School, and the intermediate section of U.S. 119. The current agreement with the Williamson WWTP establishes a rate of \$3.58 per 1,000 gallons.

Package treatment plants serve the courthouse and remaining schools. Septic systems are typically used by residences and businesses that are not otherwise served, though straight pipes are not uncommon.

ITEM 4 – NEED FOR THE PROJECT (BENEFICIARIES)

Most of the project area currently has no public sewer system. This project seeks to improve the quality of life, as well as surface water quality, in the Pond Creek and Tug Fork watersheds by providing an alternative for wastewater disposal to those who currently rely on other disposal methods such as privately owned package plants, septic tanks, or straight pipes. While privately owned package plants and septic tanks can provide adequate treatment, it is often the case that owners tend to neglect these treatment systems over time. This tendency increases the likelihood that these facilities will eventually fail and begin to directly discharge untreated wastewaters to the environment. When untreated wastewater is released into the environment, it becomes a public health hazard and a significant threat to aquatic ecosystems.

The selected project alternate (see ITEM 6) will provide new sewer collection service to approximately 471 customers, including those from Forest Hills. 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

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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.

ITEM 5 – DESIGN ALTERNATES

Design Alternates Considered

Four design alternates are presented below, as well as a “no action” alternate. A map of each proposed design alternate is provided in this report as **Exhibit B**. The Engineer’s Opinion of Probable Project Cost and Funding Scenario for each design alternate is presented as **Exhibit C**.

I. Flow Reversal From Forest Hills to New Belfry 0.1 MGD WWTP

This alternate would construct a force main from the existing Forest Hills lift station to a new 100,000 GPD wastewater treatment plant at Pegs Branch near Belfry. This includes a new lift station near Toler and service connections to Southside Elementary and Belfry Middle School. No residential service connections are included, as the line from Forest Hills to Belfry would be transmission only.

II. Flow Reversal From Forest Hills to New Belfry 0.3 MGD WWTP

This alternate would construct a force main from the existing Forest Hills lift station to a new 300,000 GPD wastewater treatment plant at Pegs Branch near Belfry. This includes a new lift station near Toler and service connections to Southside Elementary, Belfry Middle School, and 256 additional businesses and residences from Forest Hills to Murphy Bottom in Belfry.

III. Belfry to Forest Hills Lift Station / Williamson WWTP

This alternate would construct a force main from Murphy Bottom near Belfry to the existing Forest Hills lift station. From there, existing lines would transport wastewater on to the Williamson WWTP. This includes a new lift station near Toler and service connections to Southside Elementary, Belfry Middle School, and 278 additional businesses and residences in the Toler and Belfry areas.

IV. Belfry Only to New Belfry 0.1 MGD WWTP

This alternate would construct a force main in the immediate Belfry area only to a new 100,000 GPD wastewater treatment plant at Pegs Branch. This includes service connections to Belfry Middle School and 206 businesses and residences from Murphy Bottom to Cow Branch.

V. No Action

The No Action alternate would maintain the existing operating conditions. The District would continue to pay Williamson for treatment, which currently averages approximately \$7,500 per month. Surface water quality would remain poor as failing septic systems and straight pipes remain in service. Economic growth would be limited by the lack of public sewer.

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ITEM 6 – PREFERRED ALTERNATE

As of this writing, the District proposes to select Alternate II and construct a new 300,000 GPD membrane bioreactor (MBR) plant with an ultimate capacity of 400,000 GPD at the Pegs Branch site with a force main collection system initially serving Forest Hills, Belfry, and residents in between.

ITEM 7 – LIFE EXPECTANCY

The design lives of the major components of the project are as follows:

Pumps	5-10 Years
Wet Wells/Tankage	20-25 Years
Process Piping	~50 Years
Collection Lines	~50 Years

ITEM 8 – LANDS / EASEMENTS / PERMITS

The Pegs Branch property will need to be acquired by the District. Easements shall be acquired for all line construction falling outside of established right of way.

The permits anticipated to be required for this project are:

- KYTC Encroachment Permit
- KYDOW Stream Construction Permit
- KYDOW Facilities Construction Permit
- KPDES Permit
- SECTION 404 Permit to Construct Along or Across a Stream Course
- USACE Nationwide Permit

Filing
CONTAINS
LARGE OR OVERSIZED
MAP(S)

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(12/03/2018)

EXHIBIT C-1
Belfry / Pond Creek
Sanitary Sewer Collection System

Engineer's Opinion of Probable Project Cost
 Alternate I - Flow Reversal from Forest Hills to New Belfry 0.1 MGD WWTP
 2/14/2013

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	General				
a	Mobilization / Demobilization (Note 2)	LS	1	\$20,000.00	\$20,000.00
b	Seeding and Cleanup	LS	1	\$10,000.00	\$10,000.00
c	Special Pipe Bedding (Note 3)	TON	200	\$10.00	\$2,000.00
d	Removal of Existing Package Plants	EA	2	\$4,000.00	\$8,000.00
e	Pavement Replacement	LS	1	\$20,000.00	\$20,000.00
f	Flowable Fill (Note 3)	CY	50	\$100.00	\$5,000.00
2	Force Mains / Sewer Lines				
a	8" Force Main Sewer Pipe	LF	9,130	\$22.00	\$200,860.00
b	6" Force Main Sewer Pipe	LF	10,870	\$20.00	\$217,400.00
c	2" Force Main Sewer Pipe	LF	800	\$14.00	\$11,200.00
d	6" Gravity Sewer Pipe (Tri/Quadplex Connection)	LF	300	\$40.00	\$12,000.00
e	Connect to Existing Forest Hills Lift Station	EA	1	\$5,000.00	\$5,000.00
3	Fittings and Valves				
a	8" Valve	EA	5	\$2,200.00	\$11,000.00
b	6" Valve	EA	6	\$2,000.00	\$12,000.00
c	Air/Vacuum Relief Assembly	EA	4	\$3,000.00	\$12,000.00
4	Encasements				
a	Bore and Encase 8" Pipe	LF	220	\$225.00	\$49,500.00
b	Bore and Encase 6" Pipe	LF	280	\$200.00	\$56,000.00
c	Open Cut and Encase 8" Pipe	LF	120	\$100.00	\$12,000.00
d	Open Cut and Encase 6" Pipe	LF	280	\$80.00	\$22,400.00
5	Residential Grinder Pump / Service Connections				
a	Pressure Sewer Lateral Assembly for Res. Grinders	EA	4	\$450.00	\$1,800.00
b	Triplex Pump Station, Complete, In-Place	EA	1	\$10,000.00	\$10,000.00
c	Complete Triplex Grinder Pump Station - Materials	EA	1	\$5,000.00	\$5,000.00
d	Quadplex Pump Station, Complete, In-Place	EA	1	\$15,000.00	\$15,000.00
e	Complete Quadplex Grinder Pump Station - Materials	EA	1	\$8,000.00	\$8,000.00
6	Lift Stations				
a	Toler Lift Station, Complete, In-Service	LS	1	\$100,000.00	\$100,000.00
ESTIMATED CONSTRUCTION COSTS					\$826,160.00
	Construction Contingency @ 10%				\$82,616.00
	Basic Engineering			8.99%	\$81,671.70
	Resident Inspection			5.78%	\$52,545.43
	Miscellaneous / ROW / Permits / Etc.				\$2,006.87
TOTAL PROJECT COST					\$1,045,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: The amount bid for "Mobilization/Demobilization" may not exceed 3% of the Base Bid Total.

Note 3: Only installed on written order of the Engineer.

Note 4: Assume 20 LF per connection.

EXHIBIT C-1
Belfry / Pond Creek
Wastewater Treatment Plant

Engineer's Opinion of Probable Project Cost
100,000 GPD Extended Aeration Plant
2/14/2013

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	WWTP (Note 2)				
a	Mobilization and Site Preparation	LS	1	\$105,000.00	\$105,000.00
b	Site Earthwork	CY	16,300	\$15.00	\$244,500.00
c	100,000 GPD, Pre-Cast Concrete Extended Aeration Wastewater Treatment Plant, Complete, In-Place	LS	1	\$960,000.00	\$960,000.00
d	1,330 SF Masonry Block Control Building, Complete, In-Place	LS	1	\$165,000.00	\$165,000.00
e	4" Crushed Stone Pavement and Type III Geotextile Fabric, Complete, In-Place	SY	1,280	\$18.00	\$23,040.00
f	Asphalt Pavement, 8" DGA Base, 4" Asphalt Base, 1" Surface, Complete, In-Place	SY	565	\$65.00	\$36,725.00
g	4" Concrete Sidewalks, Complete, In-Place	SY	86	\$40.00	\$3,440.00
h	8' High Chain Link Security Fence w/ Sliding Gate and Controls, Complete, In-Place	LF	1,063	\$48.00	\$51,024.00
i	230 kW Diesel Generator Complete w/ Transfer Switch and All Other Appurtenances	LS	1	\$95,000.00	\$95,000.00
j	AEP Fees to Relocate 3-Phase Power	LS	1	\$30,000.00	\$30,000.00
k	Wastewater Laboratory Equipment	LS	1	\$35,000.00	\$35,000.00
l	Miscellaneous Work Items	LS	1	\$150,000.00	\$150,000.00
2	WWTP Water Supply				
a	4" DI Water Line, CL 350, PJ	LF	1,350	\$25.00	\$33,750.00
b	2" Copper Service Line, Type "K"	LF	10	\$30.00	\$300.00
c	4" Blow-off Hydrant	EA	1	\$2,500.00	\$2,500.00
d	2" Water Meter Set with Backflow Prevention Device	EA	1	\$2,500.00	\$2,500.00
e	Open Cut and Encase 4" Water Line	LF	25	\$75.00	\$1,875.00
f	Connect to Existing	EA	1	\$1,500.00	\$1,500.00
g	4" Gate Valve	EA	2	\$1,200.00	\$2,400.00
ESTIMATED CONSTRUCTION COSTS					\$1,943,554.00
	Construction Contingency @ 10%				\$194,355.40
	Basic Engineering			7.59%	\$162,288.70
	Resident Inspection			4.52%	\$96,569.37
	Miscellaneous / ROW / Permits / Etc.				\$3,232.53
TOTAL PROJECT COST					\$2,400,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: Unit prices from original low bid by H2O Construction.

Belfry / Pond Creek

Sanitary Sewer Collection System and Wastewater Treatment Plant

Exhibit C-1 Funding Scenario
2/21/2013

FUNDING AVAILABLE	
Coal Severance	\$2,850,000.00

RATE SCHEDULE AND AVERAGE REVENUE	
First 2,000 Gallons (Minimum Monthly Bill):	\$14.00
Every 1,000 Gallons Over 2,000:	\$6.00
Average Usage per User, Gallons per Month:	4,500
Average Monthly Revenue per User:	\$29.00

ALTERNATE 1 - FLOW REVERSAL FOREST HILLS TO NEW BELFRY 0.1 MGD WWTP	
Description	
Construct force main from existing Forest Hills lift station to new 100,000 GPD wastewater treatment plant at Pegs Branch near Belfry. Includes new lift station near Toler and service connections to Southside Elementary and Belfry Middle School. No residential service connections are included.	
Project Cost and Funding	
Total Project Cost for Collection System:	\$1,045,000.00
Total Project Cost for WWTP:	\$2,400,000.00
Combined Total Project Cost:	\$3,445,000.00
Additional Funds Needed:	\$595,000.00
RD Grant Amount Needed (30%):	\$178,500.00
RD Loan Amount Needed (70%):	\$416,500.00
Users Served	
Residential Users Served (Forest Hills Only):	215
Schools Served:	3
Projected Revenues	
Anticipated Monthly Revenue from Residential Users:	\$6,235.00
Anticipated Average Monthly Revenue from Schools:	\$2,598.00
Total Anticipated Monthly Revenue:	\$8,833.00
Total Anticipated Annual Revenue:	\$105,996.00
Expenditures and Balance	
RD Annual Loan Payment Amount (Assume 40-year Loan at 2.85% Interest):	\$17,584.48
Remaining Annual Balance After RD Loan Payment:	\$88,411.52

EXHIBIT C-2
Belfry / Pond Creek
Sanitary Sewer Collection System

Engineer's Opinion of Probable Project Cost
 Alternate II - Flow Reversal from Forest Hills to New Belfry 0.3 MGD WWTP
 9/25/2014

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	General				
a	Mobilization / Demobilization (Note 2)	LS	1	\$70,000.00	\$70,000.00
b	Seeding and Cleanup	LS	1	\$10,000.00	\$10,000.00
c	Special Pipe Bedding (Note 3)	TON	200	\$10.00	\$2,000.00
d	Removal of Existing Septic Tanks	EA	5	\$600.00	\$3,000.00
e	Removal of Existing Package Plants	EA	2	\$4,000.00	\$8,000.00
f	Pavement Replacement	LS	1	\$40,000.00	\$40,000.00
g	Flowable Fill (Note 3)	CY	50	\$100.00	\$5,000.00
2	Force Mains / Sewer Lines				
a	8" Force Main Sewer Pipe	LF	15,300	\$22.00	\$336,600.00
b	6" Force Main Sewer Pipe	LF	10,000	\$20.00	\$200,000.00
c	3" Force Main Sewer Pipe	LF	2,270	\$17.00	\$38,590.00
d	2" Force Main Sewer Pipe	LF	13,700	\$14.00	\$191,800.00
e	1.25" Force Main Sewer Pipe (Service)	LF	22,000	\$13.00	\$286,000.00
f	4" Gravity Sewer Pipe (House Connection, Note 4)	LF	5,720	\$30.00	\$171,600.00
g	6" Gravity Sewer Pipe (Tri/Quadplex Connection)	LF	300	\$40.00	\$12,000.00
h	Connect to Existing Forest Hills Lift Station	EA	1	\$5,000.00	\$5,000.00
3	Fittings and Valves				
a	8" Valve	EA	11	\$2,200.00	\$24,200.00
b	6" Valve	EA	6	\$2,000.00	\$12,000.00
c	3" Valve	EA	5	\$1,500.00	\$7,500.00
d	2" Valve	EA	18	\$1,000.00	\$18,000.00
e	Flushing Connection Type 3	EA	7	\$2,500.00	\$17,500.00
f	Air/Vacuum Relief Assembly	EA	4	\$3,000.00	\$12,000.00
4	Encasements				
a	Bore and Encase 8" Pipe	LF	220	\$225.00	\$49,500.00
b	Bore and Encase 6" Pipe	LF	280	\$200.00	\$56,000.00
c	Open Cut and Encase 8" Pipe	LF	160	\$100.00	\$16,000.00
d	Open Cut and Encase 6" Pipe	LF	280	\$80.00	\$22,400.00
e	Open Cut and Encase 3" Pipe	LF	170	\$60.00	\$10,200.00
5	Residential Grinder Pump / Service Connections				
a	Residential Grinder Pump Station, Complete, In-Place	EA	278	\$2,500.00	\$695,000.00
b	Pressure Sewer Lateral Assembly for Res. Grinders	EA	300	\$450.00	\$135,000.00
c	Complete Residential Grinder Pump Package - Materials	EA	278	\$2,000.00	\$556,000.00
d	Extra Vertical Height Residential Grinder Enclosure - Materials	VF	10	\$100.00	\$1,000.00
e	Extra Vertical Height Residential Grinder Enclosure	VF	10	\$150.00	\$1,500.00
f	Duplex Pump Station, Complete, In-Place	EA	8	\$6,000.00	\$48,000.00
g	Complete Duplex Grinder Pump Station - Materials	EA	8	\$4,000.00	\$32,000.00
h	Triplex Pump Station, Complete, In-Place	EA	1	\$10,000.00	\$10,000.00
i	Complete Triplex Grinder Pump Station - Materials	EA	1	\$5,000.00	\$5,000.00
j	Quadplex Pump Station, Complete, In-Place	EA	1	\$15,000.00	\$15,000.00
k	Complete Quadplex Grinder Pump Station - Materials	EA	1	\$8,000.00	\$8,000.00
6	Lift Stations				
a	Toler Lift Station, Complete, In-Service	LS	1	\$100,000.00	\$100,000.00
ESTIMATED CONSTRUCTION COSTS					\$3,231,390.00
	Construction Contingency @ 10%				\$323,139.00
	Basic Engineering			7.05%	\$250,594.29
	Resident Inspection			3.84%	\$136,493.91
	Miscellaneous / ROW / Permits / Etc.				\$8,382.79
TOTAL PROJECT COST					\$3,950,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: The amount bid for "Mobilization/Demobilization" may not exceed 3% of the Base Bid Total.

Note 3: Only installed on written order of the Engineer.

Note 4: Assume 20 LF per connection.

Belfry / Pond Creek Wastewater Treatment Plant

Engineer's Opinion of Probable Project Cost
300,000 GPD MBR (400,000 GPD Ultimate)

Revised 9-25-14

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	WWTP				
a	Mobilization and Site Preparation	LS	1	\$105,000.00	\$105,000.00
b	Site Earthwork	CY	16,300	\$15.00	\$244,500.00
c	300,000 GPD (Expandable to 400,000 GPD) Membrane Bioreactor (MBR) Wastewater Treatment Plant, Complete, In-Place	LS	1	\$2,000,000.00	\$2,000,000.00
d	1,330 SF Masonry Block Control Building, Complete, In-Place	LS	1	\$165,000.00	\$165,000.00
e	4" Crushed Stone Pavement and Type III Geotextile Fabric, Complete, In-Place	SY	1,280	\$18.00	\$23,040.00
f	Asphalt Pavement, 8" DGA Base, 4" Asphalt Base, 1" Surface, Complete, In-Place	SY	565	\$65.00	\$36,725.00
g	4" Concrete Sidewalks, Complete, In-Place	SY	86	\$40.00	\$3,440.00
h	8' High Chain Link Security Fence w/ Sliding Gate and Controls, Complete, In-Place	LF	1,063	\$48.00	\$51,024.00
i	230 kW Diesel Generator Complete w/ Transfer Switch and All Other Appurtenances	LS	1	\$95,000.00	\$95,000.00
j	AEP Fees to Relocate 3-Phase Power		1	\$30,000.00	\$30,000.00
k	Wastewater Laboratory Equipment	LS	1	\$35,000.00	\$35,000.00
l	Miscellaneous Work Items	LS	1	\$150,000.00	\$150,000.00
2	WWTP Water Supply				
a	4" DI Water Line, CL 350, PJ	LF	1,350	\$25.00	\$33,750.00
b	2" Copper Service Line, Type "K"	LF	10	\$30.00	\$300.00
c	4" Blow-off Hydrant	EA	1	\$2,500.00	\$2,500.00
d	2" Water Meter Set with Backflow Prevention Device	EA	1	\$2,500.00	\$2,500.00
e	Open Cut and Encase 4" Water Line	LF	25	\$75.00	\$1,875.00
f	Connect to Existing	EA	1	\$1,500.00	\$1,500.00
g	4" Gate Valve	EA	2	\$1,200.00	\$2,400.00
ESTIMATED CONSTRUCTION COSTS					\$2,983,554.00
	Construction Contingency @ 10%				\$298,355.40
	Basic Engineering			7.13%	\$234,000.14
	Resident Inspection			3.92%	\$128,486.75
	Land Acquisition				\$253,000.00
	Miscellaneous / ROW / Permits / Etc.				\$5,603.71
TOTAL PROJECT COST					\$3,903,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: Unit prices from original low bid by H2O Construction. Item 1c unit price from supplier.

Belfry / Pond Creek Sanitary Sewer Collection System and Wastewater Treatment Plant

Exhibit C-2 Funding Scenario

Revised 9-25-14

FUNDING AVAILABLE	
Coal Severance	\$2,850,000.00

RATE SCHEDULE AND AVERAGE REVENUE	
First 2,000 Gallons (Minimum Monthly Bill):	\$14.00
Every 1,000 Gallons Over 2,000:	\$6.00
Average Usage per User, Gallons per Month:	4,500
Average Monthly Revenue per User:	\$29.00

ALTERNATE 2 - FLOW REVERSAL FOREST HILLS TO NEW BELFRY 0.3 MGD MBR WWTP	
Description	
Construct force main from existing Forest Hills lift station to new 300,000 GPD MBR wastewater treatment plant at Pegs Branch near Belfry. Includes new lift station near Toler and service connections to Southside Elementary, Belfry Middle School, and 286 additional businesses and residences from Forest Hills to Murphy Bottom.	
Project Cost and Funding	
Total Project Cost for Collection System:	\$3,950,000.00
Total Project Cost for WWTP:	\$3,903,000.00
Administrative Expenses:	\$217,000.00
Legal Expenses:	\$50,000.00
Combined Total Project Cost:	\$8,120,000.00
Additional Funds Needed:	\$5,270,000.00
RD Grant Amount Needed (30%):	\$1,581,000.00
RD Loan Amount Needed (70%):	\$3,689,000.00
Users Served	
Residential Users Served (Includes Forest Hills):	471
Schools Served:	3
Projected Revenues	
Anticipated Monthly Revenue from Residential Users:	\$13,659.00
Anticipated Average Monthly Revenue from Schools:	\$2,598.00
Total Anticipated Monthly Revenue:	\$16,257.00
Total Anticipated Annual Revenue:	\$195,084.00
Expenditures and Balance	
RD Annual Loan Payment Amount (Assume 40-year Loan at 2.85% Interest):	\$155,748.25
Remaining Annual Balance After RD Loan Payment:	\$39,335.75

EXHIBIT C-3
Belfry / Pond Creek
Sanitary Sewer Collection System

Engineer's Opinion of Probable Project Cost
 Alternate III - Belfry to Forest Hills Lift Station / Williamson WWTP
 2/14/2013

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	General				
a	Mobilization / Demobilization (Note 2)	LS	1	\$75,000.00	\$75,000.00
b	Seeding and Cleanup	LS	1	\$10,000.00	\$10,000.00
c	Special Pipe Bedding (Note 3)	TON	200	\$10.00	\$2,000.00
d	Removal of Existing Septic Tanks	EA	5	\$600.00	\$3,000.00
e	Removal of Existing Package Plants	EA	2	\$4,000.00	\$8,000.00
f	Pavement Replacement	LS	1	\$20,000.00	\$20,000.00
g	Flowable Fill (Note 3)	CY	50	\$100.00	\$5,000.00
2	Force Mains / Sewer Lines				
a	6" Force Main Sewer Pipe	LF	20,620	\$20.00	\$412,400.00
b	4" Force Main Sewer Pipe	LF	1,900	\$18.00	\$34,200.00
c	3" Force Main Sewer Pipe	LF	2,720	\$17.00	\$46,240.00
d	2" Force Main Sewer Pipe	LF	14,290	\$14.00	\$200,060.00
e	1.25" Force Main Sewer Pipe (Service)	LF	19,730	\$13.00	\$256,490.00
f	4" Gravity Sewer Pipe (House Connection, Note 4)	LF	5,560	\$30.00	\$166,800.00
g	6" Gravity Sewer Pipe (Tri/Quadplex Connection)	LF	300	\$40.00	\$12,000.00
h	Connect to Existing Forest Hills Lift Station	EA	1	\$5,000.00	\$5,000.00
3	Fittings and Valves				
a	6" Valve	EA	13	\$2,000.00	\$26,000.00
b	4" Valve	EA	2	\$1,800.00	\$3,600.00
c	3" Valve	EA	5	\$1,500.00	\$7,500.00
d	2" Valve	EA	14	\$1,000.00	\$14,000.00
e	Flushing Connection Type 3	EA	4	\$2,500.00	\$10,000.00
f	Air/Vacuum Relief Assembly	EA	4	\$3,000.00	\$12,000.00
4	Encasements				
a	Bore and Encase 6" Pipe	LF	380	\$200.00	\$76,000.00
b	Bore and Encase 3" Pipe	LF	220	\$160.00	\$35,200.00
c	Open Cut and Encase 6" Pipe	LF	420	\$80.00	\$33,600.00
d	Open Cut and Encase 3" Pipe	LF	60	\$60.00	\$3,600.00
5	Residential Grinder Pump / Service Connections				
a	Residential Grinder Pump Station, Complete, In-Place	EA	270	\$2,500.00	\$675,000.00
b	Pressure Sewer Lateral Assembly for Res. Grinders	EA	282	\$450.00	\$126,900.00
c	Complete Residential Grinder Pump Package - Materials	EA	270	\$2,000.00	\$540,000.00
d	Extra Vertical Height Residential Grinder Enclosure - Materials	VF	10	\$100.00	\$1,000.00
e	Extra Vertical Height Residential Grinder Enclosure	VF	10	\$150.00	\$1,500.00
f	Duplex Pump Station, Complete, In-Place	EA	8	\$6,000.00	\$48,000.00
g	Complete Duplex Grinder Pump Station - Materials	EA	8	\$4,000.00	\$32,000.00
h	Triplex Pump Station, Complete, In-Place	EA	1	\$10,000.00	\$10,000.00
i	Complete Triplex Grinder Pump Station - Materials	EA	1	\$5,000.00	\$5,000.00
j	Quadplex Pump Station, Complete, In-Place	EA	1	\$15,000.00	\$15,000.00
k	Complete Quadplex Grinder Pump Station - Materials	EA	1	\$8,000.00	\$8,000.00
6	Lift Stations				
a	Toler Lift Station, Complete, In-Service	LS	1	\$100,000.00	\$100,000.00
b	Forest Hills Lift Station Upgrade, Complete, In-Service	LS	1	\$100,000.00	\$100,000.00
ESTIMATED CONSTRUCTION COSTS					\$3,140,090.00
	Construction Contingency @ 10%				\$314,009.00
	Basic Engineering			7.08%	\$244,377.50
	Resident Inspection			3.86%	\$133,466.39
	Miscellaneous / ROW / Permits / Etc.				\$8,057.11
TOTAL PROJECT COST					\$3,840,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: The amount bid for "Mobilization/Demobilization" may not exceed 3% of the Base Bid Total.

Note 3: Only installed on written order of the Engineer.

Note 4: Assume 20 LF per connection.

Belfry / Pond Creek Sanitary Sewer Collection System and Wastewater Treatment Plant

Exhibit C-3 Funding Scenario

2/21/2013

FUNDING AVAILABLE	
Coal Severance	\$2,850,000.00

RATE SCHEDULE AND AVERAGE REVENUE	
First 2,000 Gallons (Minimum Monthly Bill):	\$14.00
Every 1,000 Gallons Over 2,000:	\$6.00
Average Usage per User, Gallons per Month:	4,500
Average Monthly Revenue per User:	\$29.00

ALTERNATE 3 - BELFRY TO FOREST HILLS LIFT STATION / WILLIAMSON WWTP	
Description	
Construct force main from Murphy Bottom near Belfry to existing Forest Hills lift station and on to the Williamson WWTP. Includes new lift station near Toler and service connections to Southside Elementary, Belfry Middle School, and 278 additional businesses and residences in the Toler and Belfry areas.	
Project Cost and Funding	
Total Project Cost for Collection System:	\$3,840,000.00
Total Project Cost for WWTP:	\$0.00
Combined Total Project Cost:	\$3,840,000.00
Additional Funds Needed:	\$990,000.00
RD Grant Amount Needed (30%):	\$297,000.00
RD Loan Amount Needed(70%):	\$693,000.00
Users Served	
Residential Users Served:	278
Schools Served:	2
Projected Revenues	
Anticipated Monthly Revenue from Residential Users:	\$8,062.00
Anticipated Average Monthly Revenue from Schools:	\$1,408.00
Total Anticipated Monthly Revenue:	\$9,470.00
Total Anticipated Annual Revenue:	\$113,640.00
Expenditures and Balance	
RD Annual Loan Payment Amount (Assume 40-year Loan at 2.85% Interest):	\$29,258.21
Agreement with Williamson WWTP at \$3.58 per 1,000 Gallons for Additional Users:	\$63,795.60
Remaining Annual Balance After RD Loan and Additional Williamson Payment:	\$20,586.19

EXHIBIT C-4
Belfry / Pond Creek
Sanitary Sewer Collection System

Engineer's Opinion of Probable Project Cost
 Alternate IV - Belfry Only to New Belfry 0.1 MGD WWTP
 2/14/2013

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	General				
a	Mobilization / Demobilization (Note 2)	LS	1	\$40,000.00	\$40,000.00
b	Seeding and Cleanup	LS	1	\$10,000.00	\$10,000.00
c	Special Pipe Bedding (Note 3)	TON	200	\$10.00	\$2,000.00
d	Removal of Existing Septic Tanks	EA	5	\$600.00	\$3,000.00
e	Removal of Existing Package Plants	EA	2	\$4,000.00	\$8,000.00
f	Pavement Replacement	LS	1	\$20,000.00	\$20,000.00
g	Flowable Fill (Note 3)	CY	50	\$100.00	\$5,000.00
2	Force Mains / Sewer Lines				
a	8" Force Main Sewer Pipe	LF	2,680	\$22.00	\$58,960.00
b	6" Force Main Sewer Pipe	LF	10,590	\$20.00	\$211,800.00
c	3" Force Main Sewer Pipe	LF	2,390	\$17.00	\$40,630.00
d	2" Force Main Sewer Pipe	LF	7,650	\$14.00	\$107,100.00
e	1.25" Force Main Sewer Pipe (Service)	LF	15,900	\$13.00	\$206,700.00
f	4" Gravity Sewer Pipe (House Connection, Note 4)	LF	4,120	\$30.00	\$123,600.00
g	6" Gravity Sewer Pipe (Tri/Quadplex Connection)	LF	150	\$40.00	\$6,000.00
3	Fittings and Valves				
a	8" Valve	EA	1	\$2,200.00	\$2,200.00
b	6" Valve	EA	10	\$2,000.00	\$20,000.00
c	3" Valve	EA	4	\$1,500.00	\$6,000.00
d	2" Valve	EA	12	\$1,000.00	\$12,000.00
e	Flushing Connection Type 3	EA	4	\$2,500.00	\$10,000.00
f	Air/Vacuum Relief Assembly	EA	4	\$3,000.00	\$12,000.00
4	Encasements				
a	Bore and Encase 8" Pipe	LF	120	\$225.00	\$27,000.00
b	Bore and Encase 6" Pipe	LF	120	\$200.00	\$24,000.00
c	Bore and Encase 3" Pipe	LF	120	\$160.00	\$19,200.00
d	Open Cut and Encase 6" Pipe	LF	340	\$80.00	\$27,200.00
e	Open Cut and Encase 3" Pipe	LF	60	\$60.00	\$3,600.00
5	Residential Grinder Pump / Service Connections				
a	Residential Grinder Pump Station, Complete, In-Place	EA	201	\$2,500.00	\$502,500.00
b	Pressure Sewer Lateral Assembly for Res. Grinders	EA	208	\$450.00	\$93,600.00
c	Complete Residential Grinder Pump Package - Materials	EA	201	\$2,000.00	\$402,000.00
d	Extra Vertical Height Residential Grinder Enclosure - Materials	VF	10	\$100.00	\$1,000.00
e	Extra Vertical Height Residential Grinder Enclosure	VF	10	\$150.00	\$1,500.00
f	Duplex Pump Station, Complete, In-Place	EA	5	\$6,000.00	\$30,000.00
g	Complete Duplex Grinder Pump Station - Materials	EA	5	\$4,000.00	\$20,000.00
h	Quadplex Pump Station, Complete, In-Place	EA	1	\$15,000.00	\$15,000.00
i	Complete Quadplex Grinder Pump Station - Materials	EA	1	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,079,590.00
	Construction Contingency @ 10%				\$207,959.00
	Basic Engineering			7.53%	\$172,160.94
	Resident Inspection			4.43%	\$101,269.79
	Miscellaneous / ROW / Permits / Etc.				\$4,020.27
TOTAL PROJECT COST					\$2,565,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: The amount bid for "Mobilization/Demobilization" may not exceed 3% of the Base Bid Total.

Note 3: Only installed on written order of the Engineer.

Note 4: Assume 20 LF per connection.

EXHIBIT C-4
Belfry / Pond Creek
Wastewater Treatment Plant
Engineer's Opinion of Probable Project Cost
100,000 GPD Extended Aeration Plant
2/14/2013

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1	WWTP (Note 2)				
a	Mobilization and Site Preparation	LS	1	\$105,000.00	\$105,000.00
b	Site Earthwork	CY	16,300	\$15.00	\$244,500.00
c	100,000 GPD, Pre-Cast Concrete Extended Aeration Wastewater Treatment Plant, Complete, In-Place	LS	1	\$960,000.00	\$960,000.00
d	1,330 SF Masonry Block Control Building, Complete, In-Place	LS	1	\$165,000.00	\$165,000.00
e	4" Crushed Stone Pavement and Type III Geotextile Fabric, Complete, In-Place	SY	1,280	\$18.00	\$23,040.00
f	Asphalt Pavement, 8" DGA Base, 4" Asphalt Base, 1" Surface, Complete, In-Place	SY	565	\$65.00	\$36,725.00
g	4" Concrete Sidewalks, Complete, In-Place	SY	86	\$40.00	\$3,440.00
h	8' High Chain Link Security Fence w/ Sliding Gate and Controls, Complete, In-Place	LF	1,063	\$48.00	\$51,024.00
i	230 kW Diesel Generator Complete w/ Transfer Switch and All Other Appurtenances	LS	1	\$95,000.00	\$95,000.00
j	AEP Fees to Relocate 3-Phase Power	LS	1	\$30,000.00	\$30,000.00
k	Wastewater Laboratory Equipment	LS	1	\$35,000.00	\$35,000.00
l	Miscellaneous Work Items	LS	1	\$150,000.00	\$150,000.00
2	WWTP Water Supply				
a	4" DI Water Line, CL 350, PJ	LF	1,350	\$25.00	\$33,750.00
b	2" Copper Service Line, Type "K"	LF	10	\$30.00	\$300.00
c	4" Blow-off Hydrant	EA	1	\$2,500.00	\$2,500.00
d	2" Water Meter Set with Backflow Prevention Device	EA	1	\$2,500.00	\$2,500.00
e	Open Cut and Encase 4" Water Line	LF	25	\$75.00	\$1,875.00
f	Connect to Existing	EA	1	\$1,500.00	\$1,500.00
g	4" Gate Valve	EA	2	\$1,200.00	\$2,400.00
ESTIMATED CONSTRUCTION COSTS					\$1,943,554.00
	Construction Contingency @ 10%				\$194,355.40
	Basic Engineering			7.59%	\$162,288.70
	Resident Inspection			4.52%	\$96,569.37
	Miscellaneous / ROW / Permits / Etc.				\$3,232.53
TOTAL PROJECT COST					\$2,400,000.00

Note 1: The method of payment varies with the individual item and is described at the close of each section of the Technical Specifications.

Note 2: Unit prices from original low bid by H2O Construction.

Belfry / Pond Creek

Sanitary Sewer Collection System and Wastewater Treatment Plant

Exhibit C-4 Funding Scenario
2/21/2013

FUNDING AVAILABLE	
Coal Severance	\$2,850,000.00

RATE SCHEDULE AND AVERAGE REVENUE	
First 2,000 Gallons (Minimum Monthly Bill):	\$14.00
Every 1,000 Gallons Over 2,000:	\$6.00
Average Usage per User, Gallons per Month:	4,500
Average Monthly Revenue per User:	\$29.00

ALTERNATE 4 - BELFRY ONLY TO NEW BELFRY 0.1 MGD WWTP	
Description	
Construct force main in the Belfry area only to new 100,000 GPD wastewater treatment plant at Pegs Branch. Includes service connections to Belfry Middle School and 206 businesses and residences from Murphy Bottom to Cow Branch.	
Project Cost and Funding	
Total Project Cost for Collection System:	\$2,565,000.00
Total Project Cost for WWTP:	\$2,400,000.00
Combined Total Project Cost:	\$4,965,000.00
Additional Funds Needed:	\$2,115,000.00
RD Grant Amount Needed (30%):	\$634,500.00
RD Loan Amount Needed (70%):	\$1,480,500.00
Users Served	
Residential Users Served:	206
Schools Served:	1
Projected Revenues	
Anticipated Monthly Revenue from Residential Users:	\$5,974.00
Anticipated Average Monthly Revenue from Schools:	\$884.00
Total Anticipated Monthly Revenue:	\$6,858.00
Total Anticipated Annual Revenue:	\$82,296.00
Expenditures and Balance	
RD Annual Loan Payment Amount (Assume 40-year Loan at 2.85% Interest):	\$62,506.17
Remaining Annual Balance After RD Loan Payment:	\$19,789.83