XI. THE ALTERNATIVES CHOSEN TO MEET THE WASTEWATER TREATMENT NEEDS OF EACH STUDY AREA OF THE PLANNING AREA

2007 Report Chapter XI – Alternatives Chosen to Meet the Wastewater Treatment Needs of Each Study Area of the Planning Area

A. The Alternative Chosen for Evaluation

This Section is retained unaltered with the exception that new draft ordinances for West Penn Township and Walker Township are provided [Appendix R-III-1 & 2]

B. Choosing the Alternatives (Selecting the Solutions)

Study Area 1 – Village of South Tamaqua (currently 79 EDUs and 23,700 gpd)

1. Non-Structural Comprehensive Planning Alternatives

This Section is retained unaltered with the exception that West Penn Township opted out of participation in the ESP Region Planning and adoption of its ordinances.

2. Continued Use of OLDS

This Section is retained unaltered with the following recommendation.

The "2012 Needs Assessment" report defines the current functionality of each individual on-lot system. Many individual property owners can repair and/or replace their OLDS within the boundaries of their property without participation in a community system. For such properties, continued use of OLDS through maintenance, repair, and/or replacement is recommended.

3. The Use of Community Land Disposal Systems (COLDS)

This Alternative is discussed in the RETTEW Feasibility Study for Community On-Lot Sewage Disposal Systems dated June 2011. To serve the entire South Tamaqua Study Area, the surrounding soils are not suitable for community sand mounds or septic drip applications. Some soils are suitable for spray irrigation application; however, there is insufficient amount of area of suitable soil to support the required flow rates needed to serve this entire Study Area.

However, the "2012 Needs Assessment" determined that approximately 8 properties may be connected to a wildcat sewer and that a COLDS system would be an appropriate solution alternative to resolve the high needs properties.

The RETTEW memo Addendum to the COLDS Feasibility Study dated May 9, 2013 [Appendix R-V-2] reported that there is sufficient vacant property area to support COLDS in South Tamaqua for 4,800 gallons per day flows and that some soil series within the village are only slightly limited for elevated sand mounds, drip irrigation, or spray irrigation systems.

For these properties, it is recommended that a small cluster community on-lot system, COLDS, be constructed. The system would include a septic tank with effluent dosing chamber and pump, low pressure sewer collection system, and a community sand mound or drip irrigation system on nearby vacant land within the village. Estimated construction costs for this system are presented in **Exhibit R-XI-6.**

4. The Use of SFTFs or Package Treatment Facilities for Individual/Cluster of Homes

This Section is replaced with the following:

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many property owners may replace their SFTFs.

5. Implementation of On-Lot Sewage Management Program

This Section is retained unaltered.

6. Conventional Collection, Conveyance, Treatment and Discharge Alternatives

Some of the general discussion of the 2007 report is still valid; however, the cost opinions and present worth analysis exhibits, as well as the conclusion are superseded by this report.

Exhibits R-XI-1A, B, C, D, & E supersede 2007 Exhibit XI-1 for South Tamaqua Service Area 1.

Based upon the evaluation of cost opinions and present worth analysis, the 2011 Draft Act 537 Plan Update recommended alternative for implementation in South Tamaqua included a low pressure collection system to a central community pumping station and force main along SR 309 which discharges into the existing Tamaqua Borough Owl Creek Road Pump Station with ultimate treatment at the Tamaqua Borough Sewer Authority WWTP. This alternative would require the establishment of the South Tamaqua Sewer Service Area and an inter-municipal agreement between a proposed Walker/West Penn Sewer Authority and the Tamaqua Borough Sewer Authority. Although this alternative is cost effective, it has been determined to be not affordable based upon the limited density of the project and current sewage needs.

Exhibit R-II-1A Sewer Force Main Alternative - State Route 309

Study Area 2 – Villages of Clamtown & Reynolds (currently 131 EDUs and 39,300 gpd)

1. Non-Structural Comprehensive Planning Alternatives

This Section is retained unaltered with the exception that West Penn Township opted out of participation in the ESP Region Planning and adoption of its ordinances.

2. Continued Use of OLDS

This Section is retained unaltered with the following recommendation.

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many individual property owners can repair and/or replace their OLDS within the boundaries of their property without participation in community system. For such properties, continued use of OLDS through maintenance, repair, and/or replacement is recommended.

3. The Use of Community Land Disposal Systems (COLDS)

This Alternative is discussed in the RETTEW Feasibility Study for Community On-Lot Sewage Disposal Systems dated June 2011. For the Clamtown/Reynolds Study Area some soils are suitable for community sand mound, community drip irrigation, spray irrigation applications, however, there is insufficient amount of area of suitable soil to support the required flow rates needed to serve this entire Study Area.

However, the "2012 Needs Assessment" determined that 2 to 4 properties have malfunctions on small lots in the Villages of Clamtown and Reynolds. COLDS system would be an appropriate solution alternative to resolve the high needs properties.

The RETTEW memo Addendum to the COLDS Feasibility Study dated May 9, 2013 [Appendix R-V-2] reported that there is sufficient vacant property area to support COLDS in both Clamtown and Reynolds for 1,600 and 2,400 gallons per day flows. Some soil series within the villages are only moderately or slightly limited for elevated sand mounds, drip irrigation, or spray irrigation systems.

For these properties, it is recommended that a small cluster community on-lot system, COLDS, be constructed. The system would include a septic tank with effluent dosing chamber and pump, low pressure sewer collection system, and a community sand mound or drip irrigation system on nearby vacant land within the

village. Estimated construction costs for this system are presented in **Exhibits R-XI-7 & 8**.

4. The Use of SFTFs or Package Treatment Facilities for Individual/Cluster of Homes

This Section is replaced with the following:

The "2012 Needs Assessment" and Long Term On-Lot Disposal Potential Evaluation report defines the current functionality of each individual on-lot system. Many property owners may replace their SFTFs.

5. Implementation of On-Lot Sewage Management Program

This Section is retained unaltered.

6. Conventional Collection, Conveyance, Treatment and Discharge Alternatives

Some of the general discussion of the 2007 report is still valid; however, the cost opinions and present worth analysis exhibits, as well as the conclusion are superseded by this report.

Exhibits R-XI-2A, B, C, D, E, F, & G supersede 2007 Exhibit XI-2 for Clamtown/ Reynolds Service Area 2.

Based upon the evaluation of cost opinions and present worth analysis, the 2011 Draft Act 537 Plan Update recommended alternative for implementation in Clamtown/Reynolds included a low pressure collection system to a central community pumping station and force main along SR 443 which discharges into the proposed South Tamaqua Pump Station with ultimate treatment at the Tamaqua Borough Sewer Authority WWTP. This alternative would require the establishment of the Clamtown/Reynolds Sewer Service Area and an inter-municipal agreement between a proposed Walker/West Penn Sewer Authority and the Tamaqua Borough Sewer Authority. Although this alternative is cost effective, it has been determined to be not affordable based upon the limited density of the project and current sewage needs.

Exhibit R-II-2C Sewer Force Main Alternative - State Route 443

Study Area 3 – Village of Andreas (currently 52 EDUs and 15,600 gpd)

1. Non-Structural Comprehensive Planning Alternatives

This Section is retained unaltered with the exception that West Penn Township opted out of participation in the ESP Region Planning and adoption of its ordinances.

2. Continued Use of OLDS

This Section is retained unaltered with the following recommendation.

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many individual property owners can repair and/or replace their OLDS within the boundaries of their property without participation in community system. For such properties, continued use of OLDS through maintenance, repair, and/or replacement is recommended.

3. The Use of Community Land Disposal Systems (COLDS)

This Alternative is discussed in the RETTEW Feasibility Study for Community On-Lot Sewage Disposal Systems dated June 2011. For the Andreas Study Area, some soils are suitable for community sand mound, community drip irrigation, and spray irrigation applications; however, there is insufficient amount of area of suitable soil to support the required flow rates needed to serve this entire Study Area.

However, the "2012 Needs Assessment" determined that 4 to 6 properties may be connected to a wildcat sewer and that a COLDS system would be an appropriate solution alternative to resolve the high needs properties.

The RETTEW memo Addendum to the COLDS Feasibility Study dated May 9, 2013 [Appendix R-V-2] reported that there is sufficient vacant property area to support COLDS in Andreas for 2,400 gallons per day flows. Some soil series within the village are only moderately or slightly limited for elevated sand mounds, drip irrigation, or spray irrigation systems.

For these properties, it is recommended that a small cluster community on-lot system, COLDS, be constructed. The system would include a septic tank with effluent dosing chamber and pump, low pressure sewer collection system, and a community sand mound or drip irrigation system on nearby vacant land within the village. Estimated construction costs for this system are presented in **Exhibit R-XI-9**.

4. The Use of SFTFs or Package Treatment Facilities for Individual/Cluster of Homes

This Section is replaced with the following:

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many property owners may replace their SFTFs.

5. Implementation of On-Lot Sewage Management Program

This Section is retained unaltered.

6. Conventional Collection, Conveyance, Treatment and Discharge Alternatives

Some of the general discussion of the 2007 report is still valid; however, the cost opinions and present worth analysis exhibits, as well as the conclusion are superseded by this report.

Exhibits R-XI-3A, B, C, D, E, & F supersede 2007 Exhibit XI-3 for Andreas Service Area 3.

Based upon the evaluation of cost opinions and present worth analysis, the 2011 Draft Act 537 Plan Update recommended alternative for implementation in Andreas included a low pressure collection system to a central community package WWTP with a proposed discharge to Lizard Creek. This alternative would require the establishment of the Andreas Sewer Service Area and the hiring of a contract WWTP operation firm. Although this alternative is cost effective, it has been determined to be not affordable based upon the limited density of the project and current sewage needs.

Study Area 4 – Village of Snyders (currently 44 EDUs and 13,200 gpd)

1. Non-Structural Comprehensive Planning Alternatives

This Section is retained unaltered with the exception that West Penn Township opted out of participation in the ESP Region Planning and adoption of its ordinances.

2. Continued Use of OLDS

This Section is retained unaltered with the following recommendation.

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many individual property owners can repair and/or replace their OLDS within the boundaries of their property without participation in community system. For such properties, continued use of OLDS through maintenance, repair, and/or replacement is recommended.

3. The Use of Community Land Disposal Systems (COLDS)

This Alternative is discussed in the RETTEW Feasibility Study for Community On-Lot Sewage Disposal Systems dated June 2011. For the Snyders Study Area, the surrounding soils are suitable for community sand mounds, septic drip, and spray irrigation applications. There is a sufficient amount of suitable soil in the

area to support the required flow rates needed to serve the entire Study Area. Note that there is also sufficient area to support the required flow rates of both Snyders and Andreas; however, the pumping distance from Andreas makes this alternative not economical for Andreas. The most economical and least land requirement alternative is the community sand mound alternative for the Snyders area only.

However, the "2012 Needs Assessment" determined that 2 properties have malfunctions on small lots in the Village of Snyders and that a COLDS system would be an appropriate solution alternative to resolve the high needs properties.

The RETTEW memo Addendum to the COLDS Feasibility Study dated May 9, 2013 [Appendix R-V-2] reported that there is sufficient vacant property area to support COLDS in Snyders for 800 gallons per day flows. Some soil series within the village are only moderately or slightly limited for elevated sand mounds, drip irrigation, or spray irrigation systems.

For these properties, it is recommended that a small cluster community on-lot system, COLDS, be constructed. The system would include a septic tank with effluent dosing chamber and pump, low pressure sewer collection system, and a community sand mound or drip irrigation system on nearby vacant land within the village. Estimated construction costs for this system are presented in **Exhibit R-XI-10**.

4. <u>The Use of SFTFs or Package Treatment Facilities for Individual/Cluster of Homes</u>

This Section is replaced with the following:

The "2012 Needs Assessment" defines the current functionality of each individual on-lot system. Many property owners may replace their SFTFs.

5. <u>Implementation of On-Lot Sewage Management Program</u>

This Section is retained unaltered.

6. <u>Conventional Collection, Conveyance, Treatment and Discharge Alternatives</u>

Some of the general discussion of the 2007 report is still valid; however, the cost opinions and present worth analysis exhibits, as well as the conclusion are superseded by this report.

Exhibits R-XI-4A, B, C, D, E, F, G, & H supersede 2007 Exhibit XI-1 for Snyders Service Area 4.

Based upon the evaluation of cost opinions and present worth analysis, the 2011 Draft Act 537 Plan Update the most economical treatment system alternative in Snyders included a low pressure collection system to a central community package WWTP with a proposed discharge to Lizard Creek. This alternative would require the establishment of the Snyders Sewer Service Area and the hiring of a contract WWTP operation firm.

Note that the 2011 Draft Act 537 Plan Update determined that the overall most economical alternative for Andreas is a community sand mound system. However, the present worth analysis yields the second most economical as the package treatment plant and stream discharge only 12% higher than the community sand mound alternative.

During the implementation phase of this Act 537 Plan Update, it may be determined that the land acquisition costs for the community sand mound system is in fact greater than estimated at this time. The package treatment plant and stream discharge design will be very similar to that required for Andreas and could also be implemented as a viable economical alternative. Although these alternatives are cost effective, they have been determined to be not affordable based upon the limited density of the project and current sewage needs.

Study Area 5 – Medical Crossing (currently 85 EDUs and 25,500 gpd)

This Section is retained unaltered, with the following exceptions:

1. *This Service Area was not part of the scope of work of the RETTEW Feasibility Study for Community On-Lot Sewage Disposal Systems, June 2011.*

2. *The conclusion of the 2007 section recommends that a special study be proposed within three (3) years of completing sewers in the South Tamaqua Service Area. RETTEW recommends that this be revised to have a special study for this Study Area to be evaluated within five (5) years of completing sewers in South Tamaqua.*

Study Area 6 – Balance of the Planning Area

This Section is superseded.

SUMMARY

This Section is retained unaltered, with the following exceptions for the first 4 Service Area Subsections.

1. The establishment of the "South Tamaqua Service Area" to encourage specific focus on the maintenance, repair, and/or replacement of the existing on-lot sewage disposal systems, OLDS is recommended. A public cluster community

on-lot sewage disposal system, COLDS, is recommended for the properties currently connected to wildcat sewers and for those properties for which insufficient space or suitable soil is available to the property owner. The system would include a septic tank with effluent dosing chamber and pump and check valves, low pressure sewer collection system with redundant check valve and isolation valve at the point of connection to the pressure sewer, and a community sand mound or drip irrigation system on nearby vacant land within the village. The South Tamaqua Sewer Service Area Boundaries are shown in **Exhibit II-1**. The properties with confirmed malfunction and wildcat sewer connections are provided in the "2012 Needs Assessment" report.

2. The establishment of the separate "Clamtown and Reynolds Service Areas" to encourage specific focus on the maintenance, repair, and/or replacement of the existing on-lot sewage disposal systems, OLDS is recommended. A public cluster community on-lot sewage disposal system, COLDS, is recommended for the properties currently connected to wildcat sewers and for those properties for which insufficient space or suitable soil is available to the property owner. The system would include a septic tank with effluent dosing chamber and pump and check valves, low pressure sewer collection system with redundant check valve and isolation valve at the point of connection to the pressure sewer, and a community sand mound or drip irrigation system on nearby vacant land within the village. The Clamtown and Reynolds Sewer Service Area Boundaries are shown in **Exhibits II-2a & 2b**. The properties with confirmed malfunction and wildcat sewer connections are provided in the "2012 Needs Assessment" report.

3. The establishment of the "Andreas Service Area" to encourage specific focus on the maintenance, repair, and/or replacement of the existing on-lot sewage disposal systems, OLDS is recommended. A public cluster community on-lot sewage disposal system, COLDS, is recommended for the properties currently connected to wildcat sewers and for those properties for which insufficient space or suitable soil is available to the property owner. The system would include a septic tank with effluent dosing chamber and pump and check valves, low pressure sewer collection system with redundant check valve and isolation valve at the point of connection to the pressure sewer, and a community sand mound or drip irrigation system on nearby vacant land within the village. The Andreas Sewer Service Area Boundaries are shown in **Exhibit II-3**. The properties with confirmed malfunction and wildcat sewer connections are provided in the "2012 Needs Assessment" report.

4. The establishment of the "Snyders Service Area" to encourage specific focus on the maintenance, repair, and/or replacement of the existing on-lot sewage disposal systems, OLDS is recommended. A public cluster community on-lot sewage disposal system, COLDS, is recommended for the properties currently connected to wildcat sewers and for those properties for which insufficient space or suitable soil is available to the property owner. The system would

include a septic tank with effluent dosing chamber and pump and check valves, low pressure sewer collection system with redundant check valve and isolation valve at the point of connection to the pressure sewer, and a community sand mound or drip irrigation system on nearby vacant land within the village. The Snyders Sewer Service Area Boundaries are shown in **Exhibit II-4**. The properties with confirmed malfunction and wildcat sewer connections are provided in the "2012 Needs Assessment" report.

C. Funding Alternative Evaluation

For the purpose of determining project affordability, RETTEW has provided "Project" financial analysis as part of the 2011 Draft Act 537 Plan Update. The project financial analysis is still valid and presented for comparative purposes as stated below.

Based upon the preliminary meeting with representatives of RUS, it is believed that the Walker and West Penn Township Study Areas would qualify for 45% RUS grant and low interest loan for a 40 year period. This financial analysis is presented in **Exhibit R-XI-5A**. The estimated annual user fee per EDU is calculated to be approximately $1,242 or $104 per month. RETTEW recommends that these figures be used for planning purposes at this time.

After service area specific income surveys are completed, RUS grant alternatives can be determined. **Exhibit R-XI-5B** represents the financial analysis based upon a RUS 75% grant and 40 year low interest loan. The estimated annual user fee is more affordable, but these figures should not be used for preliminary planning purposes.

PennVEST grants are not generally awarded, however Exhibit R-XI-5C represents the financial analysis based upon a 50% grant and a 20 year low interest loan. This alternative is less affordable than the RUS alternative and should not be used for preliminary planning.

2011 Draft Update

Exhibit R-XI-1	Cost Opinions & Present Worth Analysis for South Tamaqua
Exhibit R-XI-1-Map	Proposed Sewer Force Main – State Route 309
Exhibit R-XI-2	Cost Opinions & Present Worth Analysis for Clamtown and Reynolds
Exhibit R-XI-2-Map	Proposed Sewer Force Main – State Route 443
Exhibit R-XI-3	Cost Opinions & Present Worth Analysis for Andreas
Exhibit R-XI-4	Cost Opinions & Present Worth Analysis for Snyders
Exhibit R-XI-5	Financial Analysis for the Overall Project

Based upon the recent Needs Assessment Report, it was determined that many property owners could repair and/or replace their current OLDS. Property owners may utilize private institutions for home equity loans to finance the repair and/or replacement system. For age qualified and/or low income property owners other programs through USDA RUS and PennVEST are available. The estimated cost and financing alternatives for OLDS are presented in **Exhibit R-XI-12**. The estimated annual user fee per EDU is

calculated to range approximately between $420 to $1,320 or $35 to $110 per month depending on qualified financing. RETTEW recommends that this Alternative Solution be implemented.

For the remaining properties connected to wildcat sewers and/or properties too small for a repair/replacement sewage facility, COLDS is recommended. The anticipated financing analysis for the one "Project "of five (5) separate village COLDS is presented in **Exhibit R-XI-11**. The estimated annual user fee per EDU is calculated to be approximately $890 or $75 per month. RETTEW recommends that this Alternative Solution be implemented.

<u>2013 Draft Update</u>

Exhibit R-XI-6	Cost Opinions for South Tamaqua COLDS
Exhibit R-XI-7	Cost Opinions for Clamtown COLDS
Exhibit R-XI-8	Cost Opinions for Reynolds COLDS
Exhibit R-XI-9	Cost Opinions for Andreas COLDS
Exhibit R-XI-10	Cost Opinions for Snyders COLDS
Exhibit R-XI-11	Financial Analysis for the Overall COLDS Project
Exhibit R-XI-12	Financial Analysis for the Example OLDS Alternatives

EXHIBIT R - XI - 1A

West Penn Township Act 537 Plans Cost Estimate
Area 1: South Tamaqua Service Area
Collection System Option A: Gravity Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 66 Approximate 79 EDU's Average Flow = 23,700 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	8-inch SDR-35 PVC Gravity Sewer (0'-8'Deep), Complete in Place	LF	8,500	$70.00	$595,000.00
A2	Standard 4-foot Diameter Precast Concrete Manhole, Complete in Place (~400 ft Max.)	EA	32	$2,500.00	$80,000.00
A3	6-inch PVC Lateral, Complete in Place to (ROW)	LF	2,000	$60.00	$120,000.00
A4	Special Crossings (PENNDOT)	LS	2	$20,000.00	$40,000.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	3,167	$50.00	$158,333.33
A6	State Road Shoulder Restoration, Complete in Place	SY	2,667	$70.00	$186,666.67
A	**Subtotal A1 - A6**				**$1,180,000.00**
B1	Rock Excavation (20% of A1 to A3)				$159,000.00
B2	Mobilization & Demobilization (3% of A)				$35,400.00
B3	Erosion & Sedimentation Control (2% of A)				$23,600.00
B4	Work Zone Traffic Control (2% of A)				$23,600.00
B5	Construction Stakeout (1% of A)				$11,800.00
B6	Bonds & Insurances (1% of A)				$11,800.00
B	**Subtotal B1 - B6**				**$265,200.00**
AB	**Subtotal A & B**				**$1,445,200.00**
C1	Attorney Fee (5% of AB)				$72,260.00
C2	Engineering Fee (20% of AB)				$289,040.00
C3	Contingencies Fee (15% of AB)				$216,780.00
C	**Subtotal C1 - C3**				**$578,080.00**
D1	**Total (A+B+C)**				**$2,023,280.00**
D2	Future Cost Adjustments (3% of D1)				**$60,698.40**
D	**Grand Total**				**$2,083,978.40**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Excavation percentage has been assumed , as no soil study is performed.
3. Depending on topography , a grinder pump may be required for certain properties with a gravity lateral.
4. Collection system is assumed to be primarily located with in roadway area.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 1B

West Penn Township Act 537 Plans Cost Estimate
Area 1: South Tamaqua Service Area
Collection System Option B: Low Pressure Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 66 Approximate 79 EDU's Average Flow = 23,700 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	2 ½ -inch Diameter Low Pressure Forcemain HDPE Sewer Pipe, complete in place using Horizontal Directional Drilling	LF	8,500	$40.00	$340,000.00
A2	Low Pressure Sewer Connections Including Tee, Curb Box, and Shut Off Valve, Complete In Place (ROW)	EA	66	$400.00	$26,400.00
A3	Simplex Grinder Pump Station w/ Electrical Connection and Alarm, Complete in Place	EA	66	$8,000.00	$528,000.00
A4	Special Crossings (PENNDOT): 6" Boring & Casing, complete in place	LF	150	$150.00	$22,500.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	317	$40.00	$12,666.67
A6	State Road Shoulder Restoration, Complete In Place	SY	267	$70.00	$18,666.67
A7	Standard 4-foot Diameter Precast Concrete Manhole Including Clean-Outs as Required, Complete in Place (~1,000 ft Max.)	EA	17	$2,000.00	$34,000.00
A	**Subtotal A1 - A7**				**$982,233.33**
B1	Rock Drilling (20% of A1)				$68,000.00
B2	Mobilization & Demobilization (3% of A)				$29,467.00
B3	Erosion & Sedimentation Control (1% of A)				$9,822.33
B4	Work Zone Traffic Control (1% of A)				$9,822.33
B5	Construction Stakeout (1% of A)				$9,822.33
B6	Bonds & Insurances (1% of A)				$9,822.33
B	**Subtotal B1 - B6**				**$136,756.33**
AB	**Subtotal A & B**				**$1,118,989.67**
C1	Attorney Fee (5% of AB)				$55,949.48
C2	Engineering Fee (20% of AB)				$223,797.93
C3	Contingencies Fee (15% of AB)				$167,848.45
C	**Subtotal C1 - C3**				**$447,595.87**
D1	**Total (A+B+C)**				**$1,566,585.53**
D2	Future Cost Adjustments (3% of D1)				$46,997.57
D	**Grand Total**				**$1,613,583.10**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Drilling percentage has been assumed, as no soil study is performed.
3. Collection system is assumed to be primarily located with in roadway area.
4. Assumed a 5 % of the total forcemain length for road restoration for lateral connections and clean-outs.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site: the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 1C

West Penn Township Act 537 Plans Cost Estimate
Area 1: South Tamaqua Service Area
Pumping/Treatment System Option A: Packaged Wastewater Treatment Plant
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 66 Approximate 79 EDU's Average Flow = 23,700 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 95 EDU's Average Flow = 28,500 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	30,000 gpd capacity BESST Packged Treatment Plant by Purestream with all internal tank components (piping, valves, diffusers, mixers, clarifiers, Blowers, EQ Blower, Airlift Blowers; walkways, handrail, EQ Pumps, flow control box, and electrical control panel)	gal	30,000	$20.00	$600,000.00
A2	Emergency Generator for Treatment Plant & Pump Station w/ Auto Transfer	LS	1	$50,000.00	$50,000.00
A3	Package Treament Plant Site Excavation	CY	6,600	$5.00	$33,000.00
A4	Site Utilities & Appurtenances, Including water, lighting, fencing, misc. piping, etc.	LS	1	$40,000.00	$40,000.00
A5	Electrical & Instrumentation Costs	LS	1	$20,000.00	$20,000.00
A	**Subtotal A1 - A5**				**$743,000.00**
B1	Rock Excavation (20% of A3)				$6,600.00
B2	Mobilization & Demobilization (3% of A)				$22,290.00
B3	Erosion & Sedimentation Control (3% of A)				$22,290.00
B4	Work Zone Traffic Control (1% of A)				$14,860.00
B5	Construction Stakeout (1% of A)				$7,430.00
B6	Bonds & Insurances (1% of A)				$7,430.00
B	**Subtotal B1 - B6**				**$80,900.00**
AB	**Subtotal A & B**				**$823,900.00**
C1	Attorney Fee (5% of AB)				$41,195.00
C2	Engineering Fee (20% of AB)				$164,780.00
C3	Contingencies Fee (15% of AB)				$123,585.00
C	**Subtotal C1 - C3**				**$329,560.00**
D1	**Total (A+B+C)**				**$1,153,460.00**
D2	Future Cost Adjustments (3% of D1)				$34,603.80
D3	Property Acquasition (1/2 Acre)				$15,000.00
D	**Grand Total**				**$1,203,063.80**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. The Biologically Engineered Single Sludge Treatment (BESST) system is type of package plant in which the wastewater flows up through a floating sludge blanket. The system consists of a complete activated sludge system furnished inside a single rectangular tank which will include an anoxic zone where influent wastewater is mixed with nitrified return activated sludge (RAS). Submersible mixers are located in the anoxic zones to increase the denitrification efficiency. After the anoxic zone, mixed liquor flows to the aeration zone. Aeration is provided by fine bubble diffusers which will allow for nitrification and biological oxygen demand (BOD) reduction.

2. Rock Excavation percentage has been assumed, as no soil study is performed.

3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 1D

West Penn Township Act 537 Plans Cost Estimate
Area 1: South Tamaqua Service Area
Pumping/Treatment System Option B: Pump Station & Discharge Forcemain to Tamaqua WWTP
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 66 Approximate 79 EDU's Average Flow = 23,700 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 95 EDU's Average Flow = 28,500 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Influent Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete in Place (30,000 gal)	gal	30,000	$5.50	$165,000.00
A2	3 -Inch Diameter HDPE DR 11 Discharge Forcemain to Tamaqua WWTP and Dicharge Forcemain Directional Drilling	LF	12,144	$40.00	$485,760.00
A3	Emergency Generator	LS	1	$50,000.00	$50,000.00
A4	Air Release Valve Vault, Complete in Place	EA	12	$3,000.00	$36,000.00
A5	Special Crossings (PENNDOT): 6" Boring & Casing, Complete in Place	LF	100	$200.00	$20,000.00
A6	Electrical & Instrumentation Costs	LS	1	$20,000.00	$20,000.00
A	**Subtotal A1 - A6**				**$776,760.00**
B1	Rock Excavation (20% of A2)				$97,152.00
B2	Mobilization & Demobilization (3% of A)				$23,302.80
B3	Erosion & Sedimentation Control (3% of A)				$23,302.80
B4	Work Zone Traffic Control (1% of A)				$15,535.20
B5	Construction Stakeout (1% of A)				$7,767.60
B6	Bonds & Insurances (1% of A)				$7,767.60
B	**Subtotal B1 - B6**				**$174,828.00**
AB	**Subtotal A & B**				**$951,588.00**
C1	Attorney Fee (5% of AB)				$47,579.40
C2	Engineering Fee (20% of AB)				$190,317.60
C3	Contingencies Fee (15% of AB)				$142,738.20
C	**Subtotal C1 - C3**				**$380,635.20**
D1	**Total (A+B+C)**				**$1,332,223.20**
D2	Future Cost Adjustments (3% of D1)				$39,966.70
D3	Property Acquasition (1/4 Acre)				$10,000.00
D	**Grand Total**				**$1,382,189.90**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed , as no soil study is performed.

2. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

3. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 1 E

West Penn Township Act 537 Update
Area 1: South Tamaqua Service Area
Treatment System Present worth Analysis for 40 Years
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 66 Approximate 79 EDU's Average Flow = 23,700 gpd

Design Flow = 30,000 gpd

No.	Description	Option A Packaged Wastewater Treatment Plant [1]	Option B Pump Station & Discharge Forcemain to Tamaqua WWTP
1	Treatment Alternative Capital Costs	$1,203,064	$1,382,190
2	Approximate Annual Electrical Costs	$8,000	$1,500
3	Approximate Annual Contract O&M Costs [2]	$25,000	$5,000
4	Approximate Annual Sludge Hauling Costs	$12,000	N/A
5	TBSA Tapping Fee [3]	N/A	$158,000
6	TBSA WWTP Annual Treatment Fees [4]	N/A	$18,170
7	Interest rate for Present Worth Calculations	3.0%	3.0%
8	Present Worth of Annual Electrical Costs	$184,918.18	$34,672.16
9	Present Worth of Annual Contract O&M Costs	$577,869.30	$115,573.86
10	Present Worth of Sludge Hauling Costs	$277,377.26	N/A
11	Present Worth of Annual Treatment Fee [3]	N/A	$419,995.41
TOTAL ESTIMATED PRESENT WORTH PROJECT COSTS		$2,243,229	$1,952,431

1. Treatment Plant system is based on the following assumptions: Influent BOD & TSS =300 mg/l, 300mg/l, NH3-N=20mg/l, P=10mg/l; Effluent BOD & TSS=20/25 mg/l, NH3-N=3 to 9 mg/l, P=N/A, D.O =5mg/l, TRC=0.5 mg/l

2. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.

3. Tamaqua Borough Sewer Authority (TBSA) Tapping fee of $2000 per EDU spread over a 20 year period.

4. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

5. Present Value or Worth = PV; Annual Costs = A; Interest Rate = I; Number of Years = n

$$PV = A \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

6. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

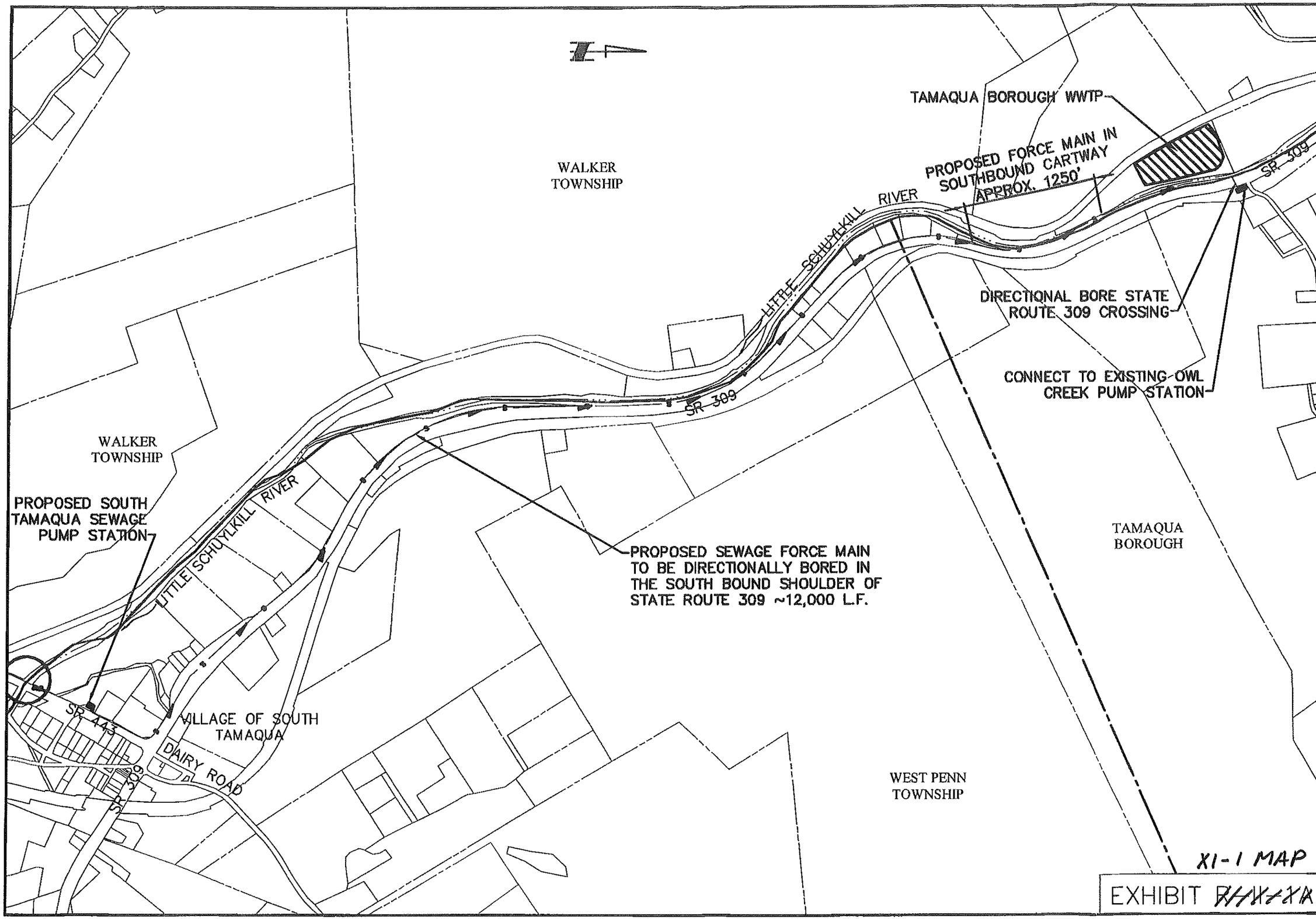


EXHIBIT ~~XI-1A~~

DRAWN BY: CH
DATE: MAY 2011
SCALE: 1" = 800'
DWG. NO. 08-03486-005

RETTEW

RETTEW Associates, Inc.
950 E. Main Street, Suite # 2210, Schuylkill Haven, PA 17972
Phone (570) 385-2270 · Fax (570) 385-2217
Engineers · Planners · Surveyors · Landscape Architects
Environmental Consultants

PROPOSED SEWER FORCE MAIN
STATE ROUTE 309

WEST PENN TOWNSHIP ACT 537 PLAN

WEST PENN TOWNSHIP SCHUYLKILL COUNTY, PA

EXHIBIT R - XI - 2A

West Penn Township Act 537 Plans Cost Estimate
Area 2a: Clamtown Service Area
Collection System Option A: Gravity Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 69 Approximate 76 EDU's Average Flow = 22,800 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	8-inch SDR-35 PVC Gravity Sewer (0'-8'Deep), Complete in Place	LF	11,200	$70.00	$784,000.00
A2	Standard 4-foot Diameter Precast Concrete Manhole, Complete in Place (~400 ft Max.)	EA	30	$2,500.00	$75,000.00
A3	6-inch PVC Lateral, Complete in Place to (ROW)	LF	2,200	$60.00	$132,000.00
A4	Special Crossings (PENNDOT)	LS	1	$20,000.00	$20,000.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	4,833	$50.00	$241,666.67
A6	State Road Shoulder Restoration, Complete in Place	SY	1,389	$70.00	$97,222.22
A	**Subtotal A1 - A6**				**$1,349,888.89**
B1	Rock Excavation (20% of A1 to A3)				$198,200.00
B2	Mobilization & Demobilization (3% of A)				$40,496.67
B3	Erosion & Sedimentation Control (2% of A)				$26,997.78
B4	Work Zone Traffic Control (2% of A)				$26,997.78
B5	Construction Stakeout (1% of A)				$13,498.89
B6	Bonds & Insurances (1% of A)				$13,498.89
B	**Subtotal B1 - B6**				**$319,690.00**
AB	**Subtotal A & B**				**$1,669,578.89**
C1	Attorney Fee (5% of AB)				$83,478.94
C2	Engineering Fee (20% of AB)				$333,915.78
C3	Contingencies Fee (15% of AB)				$250,436.83
C	**Subtotal C1 - C3**				**$667,831.56**
D1	**Total (A+B+C)**				**$2,337,410.44**
D2	Future Cost Adjustments (3% of D1)				$70,122.31
D	**Grand Total**				**$2,407,532.76**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Excavation percentage has been assumed , as no soil study is performed.
3. Depending on topography , a grinder pump may be required for certain properties with a gravity lateral.
4. Collection system is assumed to be primarily located with in roadway area.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 2B

West Penn Township Act 537 Plans Cost Estimate
Area 2a: Clamtown Service Area
Collection System Option B: Low Pressure Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 69 Approximate 76 EDU's Average Flow = 22,800 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	2 ½ -inch Diameter Low Pressure Forcemain HDPE Sewer Pipe, complete in place using Horizontal Directional Drilling	LF	11,200	$40.00	$448,000.00
A2	Low Pressure Sewer Connections Including Tee, Curb Box, and Shut Off Valve, Complete in Place (ROW)	EA	69	$400.00	$27,600.00
A3	Simplex Grinder Pump Station w/ Electrical Connection and Alarm, Complete in Place	EA	69	$8,000.00	$552,000.00
A4	Special Crossings (PENNDOT): 6" Boring & Casing, complete in place	LF	75	$150.00	$11,250.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	483	$50.00	$24,166.67
A6	State Road Shoulder Restoration, Complete in Place	SY	139	$70.00	$9,722.22
A7	Standard 4-foot Diameter Precast Concrete Manhole Including Clean-Outs as Required, Complete In Place (~1,000 ft Max.)	EA	16	$2,000.00	$32,000.00
A	**Subtotal A1 - A7**				**$1,104,738.89**
B1	Rock Drilling (20% of A1)				$89,600.00
B2	Mobilization & Demobilization (3% of A)				$33,142.17
B3	Erosion & Sedimentation Control (1% of A)				$11,047.39
B4	Work Zone Traffic Control (1% of A)				$11,047.39
B5	Construction Stakeout (1% of A)				$11,047.39
B6	Bonds & Insurances (1% of A)				$11,047.39
B	**Subtotal B1 - B6**				**$166,931.72**
AB	**Subtotal A & B**				**$1,271,670.61**
C1	Attorney Fee (5% of AB)				$63,583.53
C2	Engineering Fee (20% of AB)				$254,334.12
C3	Contingencies Fee (15% of AB)				$190,750.59
C	**Subtotal C1 - C3**				**$508,668.24**
D1	**Total (A+B+C)**				**$1,780,338.86**
D2	Future Cost Adjustments (3% of D1)				$53,410.17
D	**Grand Total**				**$1,833,749.02**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Drilling percentage has been assumed, as no soil study is performed.
3. Collection system is assumed to be primarily located with in roadway area.
4. Assumed a 5 % of the total forcemain length for road restoration for lateral connections and clean-outs.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 2C

West Penn Township Act 537 Plans Cost Estimate
Area 2b: Reynolds Service Area
Collection System Option A: Gravity Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 59 Approximate 55 EDU's Average Flow = 16,500 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	8-Inch SDR-35 PVC Gravity Sewer (0'-8'Deep), Complete in Place	LF	8,800	$70.00	$616,000.00
A2	Standard 4-foot Diameter Precast Concrete Manhole, Complete in Place (~400 ft Max.)	EA	17	$2,500.00	$42,500.00
A3	6-inch PVC Lateral, Complete in Place to (ROW)	LF	2,200	$60.00	$132,000.00
A4	Special Crossings (Railroad/Stream)	LS	2	$20,000.00	$40,000.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	11,000	$50.00	$550,000.00
A6	State Road Shoulder Restoration, Complete in Place	SY	-	$70.00	$0.00
A	**Subtotal A1 - A6**				**$1,380,500.00**
B1	Rock Excavation (20% of A1 to A3)				$158,100.00
B2	Mobilization & Demobilization (3% of A)				$41,415.00
B3	Erosion & Sedimentation Control (2% of A)				$27,610.00
B4	Work Zone Traffic Control (2% of A)				$27,610.00
B5	Construction Stakeout (1% of A)				$13,805.00
B6	Bonds & Insurances (1% of A)				$13,805.00
B	**Subtotal B1 - B6**				**$282,345.00**
AB	**Subtotal A & B**				**$1,662,845.00**
C1	Attorney Fee (5% of AB)				$83,142.25
C2	Engineering Fee (20% of AB)				$332,569.00
C3	Contingencies Fee (15% of AB)				$249,426.75
C	**Subtotal C1 - C3**				**$665,138.00**
D1	**Total (A+B+C)**				**$2,327,983.00**
D2	Future Cost Adjustments (3% of D1)				$69,839.49
D	**Grand Total**				**$2,397,822.49**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Excavation percentage has been assumed , as no soil study is performed.
3. Depending on topography , a grinder pump may be required for certain properties with a gravity lateral.
4. Collection system is assumed to be primarily located with in roadway area.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 2D

West Penn Township Act 537 Plans Cost Estimate
Area 2b: Reynolds Service Area
Collection System Option B: Low Pressure Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 59 Approximate 55 EDU's Average Flow = 16,500 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	2 ½ -inch Diameter Low Pressure Forcemain HDPE Sewer Pipe, complete in place using Horizontal Directional Drilling	LF	8,800	$40.00	$352,000.00
A2	Low Pressure Sewer Connections Including Tee, Curb Box, and Shut Off Valve, Complete in Place (ROW)	EA	59	$400.00	$23,600.00
A3	Simplex Grinder Pump Station w/ Electrical Connection and Alarm, Complete in Place	EA	59	$8,000.00	$472,000.00
A4	Special Crossings (Railroad/Stream): 6" Boring & Casing, complete in place	LF	150	$150.00	$22,500.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	880	$50.00	$44,000.00
A6	State Road Shoulder Restoration, Complete in Place	SY	-	$70.00	$0.00
A7	Standard 4-foot Diameter Precast Concrete Manhole Including Clean-Outs as Required, Complete in Place (~1,000 ft Max.)	EA	9	$2,000.00	$18,000.00
A	**Subtotal A1 - A7**				**$932,100.00**
B1	Rock Drilling (20% of A1)				$70,400.00
B2	Mobilization & Demobilization (3% of A)				$27,963.00
B3	Erosion & Sedimentation Control (1% of A)				$9,321.00
B4	Work Zone Traffic Control (1% of A)				$9,321.00
B5	Construction Stakeout (1% of A)				$9,321.00
B6	Bonds & Insurances (1% of A)				$9,321.00
B	**Subtotal B1 - B6**				**$135,647.00**
AB	**Subtotal A & B**				**$1,067,747.00**
C1	Attorney Fee (5% of AB)				$53,387.35
C2	Engineering Fee (20% of AB)				$213,549.40
C3	Contingencies Fee (15% of AB)				$160,162.05
C	**Subtotal C1 - C3**				**$427,098.80**
D1	**Total (A+B+C)**				**$1,494,845.80**
D2	Future Cost Adjustments (3% of D1)				$44,845.37
D	**Grand Total**				**$1,539,691.17**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Drilling percentage has been assumed, as no soil study is performed.
3. Collection system is assumed to be primarily located with in roadway area.
4. Assumed a 5 % of the total forcemain length for road restoration for lateral connections and clean-outs.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 2E

West Penn Township Act 537 Plans Cost Estimate
Combined Flows of Area 2a: Clamtown Service Area & Area 2b: Reynolds Service Area
Pumping/Treatment System Option A: Packaged Wastewater Treatment Plant
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 128 Approximate 131 EDU's Average Flow = 39,300 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 158 EDU's Average Flow = 47,400 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	50,000 gpd capacity BESST Packged Treatment Plant by Purestream with all internal tank components (piping, valves, diffusers, mixers, clarifiers, Blowers, EQ Blower, Airlift Blowers; walkways, handrail, EQ Pumps, flow control box, and electrical control panel)	gal	50,000	$20.00	$1,000,000.00
A2	Emergency Generator	LS	1	$60,000.00	$60,000.00
A3	Packaged Treament Plant Site Excavation	CY	13,200	$5.00	$66,000.00
A4	Site Utilities & Appurtenances, including water, lighting, fencing, misc. piping, etc.	LS	1	$40,000.00	$40,000.00
A5	Electrical & Instrumentation Costs	LS	1	$20,000.00	$20,000.00
A	**Subtotal A1 - A5**				**$1,186,000.00**
B1	Rock Excavation (20% of A3)				$13,200.00
B2	Mobilization & Demobilization (3% of A)				$35,580.00
B3	Erosion & Sedimentation Control (3% of A)				$35,580.00
B4	Work Zone Traffic Control (1% of A)				$23,720.00
B5	Construction Stakeout (1% of A)				$11,860.00
B6	Bonds & Insurances (1% of A)				$11,860.00
B	**Subtotal B1 - B6**				**$131,800.00**
AB	**Subtotal A & B**				**$1,317,800.00**
C1	Attorney Fee (5% of AB)				$65,890.00
C2	Engineering Fee (20% of AB)				$263,560.00
C3	Contingencies Fee (15% of AB)				$197,670.00
C	**Subtotal C1 - C3**				**$527,120.00**
D1	**Total (A+B+C)**				**$1,844,920.00**
D2	Future Cost Adjustments (3% of D1)				$55,347.60
D3	Property Acquasition (1/2 Acre)				$15,000.00
D	**Grand Total**				**$1,915,267.60**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. The Biologically Engineered Single Sludge Treatment (BESST) system is type of package plant in which the wastewater flows up through a floating sludge blanket. The system consists of a complete activated sludge system furnished inside a single rectangular tank which will include an anoxic zone where influent wastewater is mixed with nitrified return activated sludge (RAS). Submersible mixers are located in the anoxic zones to increase the denitrification efficiency. After the anoxic zone, mixed liquor flows to the aeration zone. Aeration is provided by fine bubble diffusers which will allow for nitrification and biological oxygen demand (BOD) reduction.

2. Rock Excavation percentage has been assumed , as no soil study is performed.

3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ, contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 2F

West Penn Township Act 537 Plans Cost Estimate
Combined Flows of Area 2a: Clamtown Service Area & Area 2b: Reynolds Service Area
Pumping/Treatment System Option B: Pump Station & Discharge Forcemain to South Tamaqua Pump Station
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows
# of Approximate Connections - 128 Approximate 131 EDU's Average Flow = 39,300 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows
Approximate 158 EDU's Average Flow = 47,400 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Influent Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete in Place (50,000 gal)	gal	50,000	$5.50	$275,000.00
A2	3 -Inch Diameter HDPE DR 11 Discharge Forcemain to Tamaqua WWTP and Discharge Forcemain Directional Drilling	LF	8,000	$40.00	$320,000.00
A3	Emergency Generator	LS	1	$60,000.00	$60,000.00
A4	Air Release Valve Vault, Complete in Place	EA	8	$3,000.00	$24,000.00
A5	Special Crossings (PENNDOT/River): 6" Boring & Casing, Complete in Place	LF	200	$200.00	$40,000.00
A6	Electrical & Instrumentation Costs	LS	1	$5,000.00	$5,000.00
A7	Additional Capacity Sizing to South Tamaqua Influent Pump Station and Forcemain	LS	1	$15,000.00	$15,000.00
A	**Subtotal A1 - A7**				**$739,000.00**
B1	Rock Excavation (20% of A3)				$64,000.00
B2	Mobilization & Demobilization (3% of A)				$22,170.00
B3	Erosion & Sedimentation Control (3% of A)				$22,170.00
B4	Work Zone Traffic Control (1% of A)				$14,780.00
B5	Construction Stakeout (1% of A)				$7,390.00
B6	Bonds & Insurances (1% of A)				$7,390.00
B	**Subtotal B1 - B6**				**$137,900.00**
AB	**Subtotal A & B**				**$876,900.00**
C1	Attorney Fee (5% of AB)				$43,845.00
C2	Engineering Fee (20% of AB)				$175,380.00
C3	Contingencies Fee (15% of AB)				$131,535.00
C	**Subtotal C1 - C3**				**$350,760.00**
D1	**Total (A+B+C)**				**$1,227,660.00**
D2	Future Cost Adjustments (3% of D1)				$36,829.80
D3	Property Acquasition (1/4 Acre)				$10,000.00
D	**Grand Total**				**$1,274,489.80**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed, as no soil study is performed.

2. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

3. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 2G

West Penn Township Act 537 Update
Area 2a: Clamtown Service Area and Area 2b: Reynolds Service Area
Treatment System Present worth Analysis for 40 Years
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 128 Approximate 131 EDU's Average Flow = 39,300 gpd

Design Flow = 50,000 gpd

No.	Description	Option A Packaged Wastewater Treatment Plant [1]	Option B Pump Station & Discharge Forcemain to Tamaqua WWTP
1	Treatment Alternative Capital Costs	$1,915,268	$1,274,490
2	Approximate Annual Electrical Costs	$15,000	$2,500
3	Approximate Annual Contract O&M Costs [2]	$25,000	$5,000
4	Approximate Annual Sludge Hauling Costs	$20,000	N/A
5	TBSA Tapping Fee [3]	N/A	$262,000
6	TBSA WWTP Annual Treatment Fees [4]	N/A	$30,130
7	Interest rate for Present Worth Calculations	3.0%	3.0%
8	Present Worth of Annual Electrical Costs	$346,721.58	$57,786.93
9	Present Worth of Annual Contract O&M Costs	$577,869.30	$115,573.86
10	Present Worth of Sludge Hauling Costs	$462,295.44	N/A
11	Present Worth of Annual Treatment Fee [3]	N/A	$696,448.08
TOTAL ESTIMATED PRESENT WORTH PROJECT COSTS		$3,302,154	$2,144,299

1. Treatment Plant system is based on the following assumptions: Influent BOD & TSS =300 mg/l, 300mg/l, NH3-N=20mg/l, P=10mg/l; Effluent BOD & TSS=20/25 mg/l, NH3-N=3 to 9 mg/l, P=N/A, D.O =5mg/l, TRC=0.5 mg/l

2. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.

3. Tamaqua Borough Sewer Authority (TBSA) Tapping fee of $2000 per EDU spread over a 20 year period.

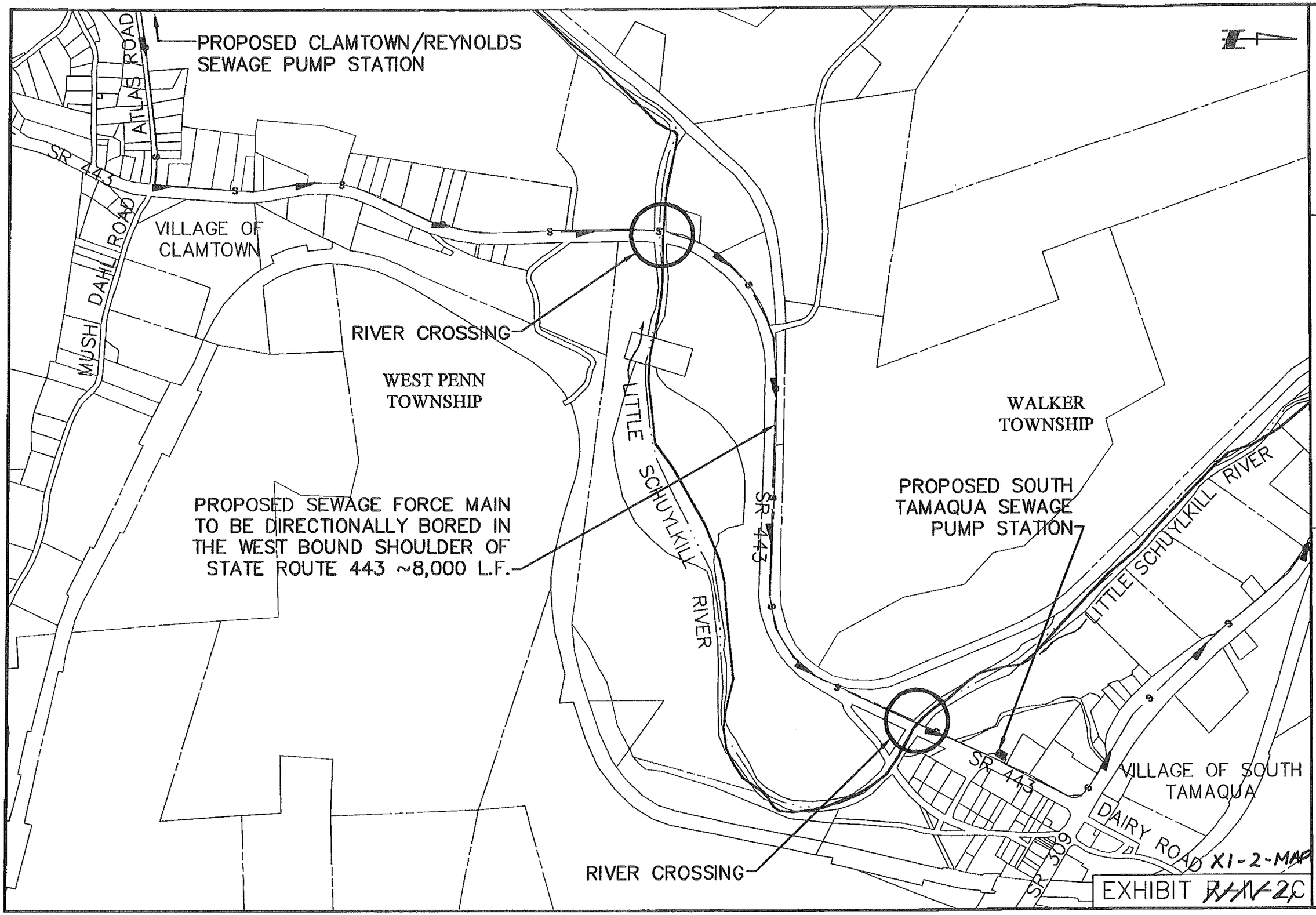
4. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

5. Present Value or Worth = PV; Annual Costs = A; Interest Rate = I; Number of Years = n

$$PV = A \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

6. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.



DRAWN BY: CH
DATE: MAY 2011
SCALE: 1" = 600'
DWG. NO. 08-03486-005

RETTEW

RETTEW Associates, Inc.
950 E. Main Street, Suite # 220, Schuylkill Haven, PA 17972
Phone (570) 385-2270 • Fax (570) 385-2217
Engineers • Planners • Surveyors • Landscape Architects
Environmental Consultants

PROPOSED SEWER FORCE MAIN
STATE ROUTE 443

WEST PENN TOWNSHIP ACT 537 PLAN

WEST PENN TOWNSHIP SCHUYLKILL COUNTY, PA

EXHIBIT R - XI - 3A

West Penn Township Act 537 Plans Cost Estimate
Area 3: Andreas Service Area
Collection System Option A: Gravity Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 40 Approximate 52 EDU's Average Flow = 15,600 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	8-inch SDR-35 PVC Gravity Sewer (0'-8'Deep), Complete in Place	LF	3,700	$70.00	$259,000.00
A2	Standard 4-foot Diameter Precast Concrete Manhole, Complete in Place (~400 ft Max.)	EA	11	$2,500.00	$27,500.00
A3	6-inch PVC Lateral, Complete In Place to (ROW)	LF	1,200	$60.00	$72,000.00
A4	Special Crossings (PENNDOT)	LS	1	$20,000.00	$20,000.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	917	$50.00	$45,833.33
A6	State Road Shoulder Restoration, Complete in Place	SY	1,139	$70.00	$79,722.22
A	**Subtotal A1 - A6**				**$504,055.56**
B1	Rock Excavation (20% of A1 to A3)				$71,700.00
B2	Mobilization & Demobilization (3% of A)				$15,121.67
B3	Erosion & Sedimentation Control (2% of A)				$10,081.11
B4	Work Zone Traffic Control (2% of A)				$10,081.11
B5	Construction Stakeout (1% of A)				$5,040.56
B6	Bonds & Insurances (1% of A)				$5,040.56
B	**Subtotal B1 - B6**				**$117,065.00**
AB	**Subtotal A & B**				**$621,120.56**
C1	Attorney Fee (5% of AB)				$31,056.03
C2	Engineering Fee (20% of AB)				$124,224.11
C3	Contingencies Fee (15% of AB)				$93,168.08
C	**Subtotal C1 - C3**				**$248,448.22**
D1	**Total (A+B+C)**				**$869,568.78**
D2	Future Cost Adjustments (3% of D1)				$26,087.06
D	**Grand Total**				**$895,655.84**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Excavation percentage has been assumed, as no soil study is performed.
3. Depending on topography, a grinder pump may be required for certain properties with a gravity lateral.
4. Collection system is assumed to be primarily located with in roadway area.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 3B

West Penn Township Act 537 Plans Cost Estimate
Area 3: Andreas Service Area
Collection System Option B: Low Pressure Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 40 | Approximate 52 EDU's | Average Flow = 15,600 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	2 ½ -inch Diameter Low Pressure Forcemain HDPE Sewer Pipe, complete in place using Horizontal Directional Drilling	LF	3,700	$40.00	$148,000.00
A2	Low Pressure Sewer Connections Including Tee, Curb Box, and Shut Off Valve, Complete in Place (ROW)	EA	40	$400.00	$16,000.00
A3	Simplex Grinder Pump Station w/ Electrical Connection and Alarm, Complete in Place	EA	40	$8,000.00	$320,000.00
A4	Special Crossings (PENNDOT): 6" Boring & Casing, complete in place	LF	75	$150.00	$11,250.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	92	$50.00	$4,583.33
A6	State Road Shoulder Restoration, Complete in Place	SY	114	$70.00	$7,972.22
A7	Standard 4-foot Diameter Precast Concrete Manhole Including Clean-Outs as Required, Complete in Place (~1,000 ft Max.)	EA	6	$2,000.00	$12,000.00
A	**Subtotal A1 - A7**				**$519,805.56**
B1	Rock Drilling (20% of A1)				$29,600.00
B2	Mobilization & Demobilization (3% of A)				$15,594.17
B3	Erosion & Sedimentation Control (1% of A)				$5,198.06
B4	Work Zone Traffic Control (1% of A)				$5,198.06
B5	Construction Stakeout (1% of A)				$5,198.06
B6	Bonds & Insurances (1% of A)				$5,198.06
B	**Subtotal B1 - B6**				**$65,986.39**
AB	**Subtotal A & B**				**$585,791.94**
C1	Attorney Fee (5% of AB)				$29,289.60
C2	Engineering Fee (20% of AB)				$117,158.39
C3	Contingencies Fee (15% of AB)				$87,868.79
C	**Subtotal C1 - C3**				**$234,316.78**
D1	**Total (A+B+C)**				**$820,108.72**
D2	Future Cost Adjustments (3% of D1)				$24,603.26
D	**Grand Total**				**$844,711.98**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Drilling percentage has been assumed , as no soil study is performed.
3. Collection system is assumed to be primarily located with in roadway area.
4. Assumed a 5 % of the total forcemain length for road restoration for lateral connections and clean-outs.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 3C

West Penn Township Act 537 Plans Cost Estimate
Area 3: Andreas Service Area
Pumping/Treatment System Option A: Packaged Wastewater Treatment Plant
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 40 Approximate 52 EDU's Average Flow = 15,600 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 62 EDU's Average Flow = 18,600 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	20,000 gpd capacity BESST Packged Treatment Plant by Purestream with all internal tank components (piping, valves, diffusers, mixers, clarifiers, Blowers, EQ Blower, Airlift Blowers; walkways, handrail, EQ Pumps, flow control box, and electrical control panel)	gal	20,000	$25.00	$500,000.00
A2	Emergency Generator	LS	1	$40,000.00	$40,000.00
A3	Packaged Treament Plant Site Excavation	CY	4,488	$5.00	$22,440.00
A4	Site Utilities & Appurtenances, including water, lighting, fencing, misc. piping, etc.	LS	1	$30,000.00	$30,000.00
A5	Electrical & Instrumentation Costs	LS	1	$15,000.00	$15,000.00
A	**Subtotal A1 - A5**				**$607,440.00**
B1	Rock Excavation (20% of A3)				$4,488.00
B2	Mobilization & Demobilization (3% of A)				$18,223.20
B3	Erosion & Sedimentation Control (3% of A)				$18,223.20
B4	Work Zone Traffic Control (1% of A)				$12,148.80
B5	Construction Stakeout (1% of A)				$6,074.40
B6	Bonds & Insurances (1% of A)				$6,074.40
B	**Subtotal B1 - B6**				**$65,232.00**
AB	**Subtotal A & B**				**$672,672.00**
C1	Attorney Fee (5% of AB)				$33,633.60
C2	Engineering Fee (20% of AB)				$134,534.40
C3	Contingencies Fee (15% of AB)				$100,900.80
C	**Subtotal C1 - C3**				**$269,068.80**
D1	**Total (A+B+C)**				**$941,740.80**
D2	Future Cost Adjustments (3% of D1)				$28,252.22
D3	Property Acquasition (1/2 Acre)				$15,000.00
D	**Grand Total**				**$984,993.02**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. The Biologically Engineered Single Sludge Treatment (BESST) system is type of package plant in which the wastewater flows up through a floating sludge blanket. The system consists of a complete activated sludge system furnished inside a single rectangular tank which will include an anoxic zone where influent wastewater is mixed with nitrified return activated sludge (RAS). Submersible mixers are located in the anoxic zones to increase the denitrification efficiency. After the anoxic zone, mixed liquor flows to the aeration zone. Aeration is provided by fine bubble diffusers which will allow for nitrification and biological oxygen demand (BOD) reduction.

2. Rock Excavation percentage has been assumed, as no soil study is performed.

3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 3D

West Penn Township Act 537 Plans Cost Estimate
Area 3: Andreas Service Area
Pumping/Treatment System Option B: Pump Station & Discharge Forcemain to Snyders Pump Station
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 40 Approximate 52 EDU's Average Flow = 15,600 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 62 EDU's Average Flow = 18,600 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Influent Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete in Place (20,000 gal)	gal	20,000	$6.50	$130,000.00
A2	3 -inch Diameter HDPE DR 11 Discharge Forcemain to Snyders Pump Station and Dicharge Forcemain Directional Drilling	LF	22,000	$40.00	$880,000.00
A3	Emergency Generator	LS	1	$40,000.00	$40,000.00
A4	Air Release Valve Vault, Complete in Place	EA	22	$3,000.00	$66,000.00
A5	Special Crossings (PENNDOT): 6" Boring & Casing, Complete in Place	LF	100	$200.00	$20,000.00
A6	Electrical & Instrumentation Costs	LS	1	$15,000.00	$15,000.00
A7	Upgrade for South Tamaqua Clamtown and Snyders Pump Station and Discharge Forcemain	LS	1	$15,000.00	$15,000.00
A	**Subtotal A1 - A7**				**$1,166,000.00**
B1	Rock Excavation (20% of A2)				$176,000.00
B2	Mobilization & Demobilization (3% of A)				$34,980.00
B3	Erosion & Sedimentation Control (3% of A)				$34,980.00
B4	Work Zone Traffic Control (1% of A)				$23,320.00
B5	Construction Stakeout (1% of A)				$11,660.00
B6	Bonds & Insurances (1% of A)				$11,660.00
B	**Subtotal B1 - B6**				**$292,600.00**
AB	**Subtotal A & B**				**$1,458,600.00**
C1	Attorney Fee (5% of AB)				$72,930.00
C2	Engineering Fee (20% of AB)				$291,720.00
C3	Contingencies Fee (15% of AB)				$218,790.00
C	**Subtotal C1 - C3**				**$583,440.00**
D1	**Total (A+B+C)**				**$2,042,040.00**
D2	Future Cost Adjustments (3% of D1)				$61,261.20
D3	Property Acquasition (1/4 Acre)				$10,000.00
D	**Grand Total**				**$2,113,301.20**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed , as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chossen site(s) location which will require additional cost consideration for final cost estimate.
3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI -3E

West Penn Township Act 537 Plans Cost Estimate
Area 3: Andreas Service Area
Pumping/Treatment System Option C: Pump Station & Discharge Forcemain to Snyders Elevated Sand Mound System
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 40 Approximate 52 EDU's Average Flow = 15,600 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 62 EDU's Average Flow = 18,600 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Dosing Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete In Place (20,000 gal)	gal	20,000	$6.50	$130,000.00
A2	Emergency Generator	LS	1	$40,000.00	$40,000.00
A3	Septic Tanks (5000 tanks)	EA	5	$12,000.00	$60,000.00
A4	Filtration	LS	1	$62,500.00	$62,500.00
A5	Sandmounds	SF	43,560	$9.00	$392,040.00
A6	Electrical & Instrumentation Costs	LS	1	$15,000.00	$15,000.00
A7	Site Work	LS	1	$68,454.00	$68,454.00
A8	3 -Inch Diameter HDPE DR 11 Discharge Forcemain to Snyders Pump Station and Dicharge Forcemain Directional Drilling	LF	22,000	$40.00	$880,000.00
A	**Subtotal A1 - A8**				**$1,647,994.00**
B1	Rock Excavation (20% of A8)				$176,000.00
B2	Mobilization & Demobilization (3% of A)				$49,439.82
B3	Erosion & Sedimentation Control (3% of A)				$49,439.82
B4	Work Zone Traffic Control (1% of A)				$32,959.88
B5	Construction Stakeout (1% of A)				$16,479.94
B6	Bonds & Insurances (1% of A)				$16,479.94
B	**Subtotal B1 - B6**				**$340,799.40**
AB	**Subtotal A & B**				**$1,988,793.40**
C1	Attorney Fee (5% of AB)				$99,439.67
C2	Engineering Fee (20% of AB)				$397,758.68
C3	Contingencies Fee (15% of AB)				$298,319.01
C	**Subtotal C1 - C3**				**$795,517.36**
D1	**Total (A+B+C)**				**$2,784,310.76**
D2	Future Cost Adjustments (3% of D1)				$83,529.32
D3	Property Acquasition (3 Acres)				$25,000.00
D	**Grand Total**				**$2,892,840.08**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed , as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chossen site(s) location which will require additional cost consideration for final cost estimate.
3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 3F

West Penn Township Act 537 Update
Area 3: Andreas Service Area
Treatment System Present worth Analysis for 40 Years
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 40 Approximate 52 EDU's Average Flow = 15,600 gpd

Design Flow = 16,000 gpd

No.	Description	Option A Packaged Wastewater Treatment Plant [1]	Option B Pump Station & Discharge Forcemain to Snyders Pump Station	Option C Pump Station & Discharge Forcemain to Snyders Elevated Sand Mound System
1	Treatment Alternative Capital Costs	$984,993	$2,113,301	$2,892,840
2	Approximate Annual Electrical Costs	$6,000	$1,200	$1,200
3	Approximate Annual Contract O&M Costs [2]	$25,000	$5,000	$5,000
4	Approximate Annual Sludge Hauling Costs	$7,000	N/A	$5,000
5	TBSA Tapping Fee [3]	N/A	$104,000	N/A
6	TBSA WWTP Annual Treatment Fees [4]	N/A	$11,960	N/A
7	Interest rate for Present Worth Calculations	3.0%	3.0%	3.0%
8	Present Worth of Annual Electrical Costs	$138,688.63	$27,737.73	$27,737.73
9	Present Worth of Annual Contract O&M Costs	$577,869.30	$115,573.86	$115,573.86
10	Present Worth of Sludge Hauling Costs	$161,803.40	N/A	$115,573.86
11	Present Worth of Annual Treatment Fee [3]	N/A	$276,452.67	N/A
TOTAL ESTIMATED PRESENT WORTH PROJECT COSTS		$1,863,354	$2,533,065	$3,151,726

1. Treatment Plant system is based on the following assumptions: Influent BOD & TSS =300 mg/l, 300mg/l, NH3-N=20mg/l, P=10mg/l; Effluent BOD & TSS=20/25 mg/l, NH3-N=3 to 9 mg/l, P=N/A, D.O =5mg/l, TRC=0.5 mg/l

2. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.

3. Tamaqua Borough Sewer Authority (TBSA) Tapping fee of $2000 per EDU spread over a 20 year period.

4. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

5. Present Value or Worth = PV; Annual Costs = A; Interest Rate = I; Number of Years = n

$$PV = A \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

6. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 4A

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Collection System Option A: Gravity Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	8-inch SDR-35 PVC Gravity Sewer (0'-8'Deep), Complete in Place	LF	5,000	$70.00	$350,000.00
A2	Standard 4-foot Diameter Precast Concrete Manhole, Complete in Place (~400 ft Max.)	EA	12	$2,500.00	$30,000.00
A3	6-inch PVC Lateral, Complete in Place to (ROW)	LF	1,400	$60.00	$84,000.00
A4	Special Crossings (PENNDOT)	LS	3	$20,000.00	$60,000.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	1,500	$50.00	$75,000.00
A6	State Road Shoulder Restoration, Complete in Place	SY	1,278	$70.00	$89,444.44
A	**Subtotal A1 - A6**				**$688,444.44**
B1	Rock Excavation (20% of A1 to A3)				$92,800.00
B2	Mobilization & Demobilization (3% of A)				$20,653.33
B3	Erosion & Sedimentation Control (2% of A)				$13,768.89
B4	Work Zone Traffic Control (2% of A)				$13,768.89
B5	Construction Stakeout (1% of A)				$6,884.44
B6	Bonds & Insurances (1% of A)				$6,884.44
B	**Subtotal B1 - B6**				**$154,760.00**
AB	**Subtotal A & B**				**$843,204.44**
C1	Attorney Fee (5% of AB)				$42,160.22
C2	Engineering Fee (20% of AB)				$168,640.89
C3	Contingencies Fee (15% of AB)				$126,480.67
C	**Subtotal C1 - C3**				**$337,281.78**
D1	**Total (A+B+C)**				**$1,180,486.22**
D2	Future Cost Adjustments (3% of D1)				$35,414.59
D	**Grand Total (A+B+C)**				**$1,215,900.81**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Excavation percentage has been assumed , as no soil study is performed.
3. Depending on topography , a grinder pump may be required for certain properties with a gravity lateral.
4. Collection system is assumed to be primarily located with in roadway area.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 4B

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Collection System Option B: Low Pressure Sewer Collection System
RETTEW Project No: 08-03486-005
July 15, 2011

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	2 ½ -inch Diameter Low Pressure Forcemain HDPE Sewer Pipe, complete in place using Horizontal Directional Drilling	LF	5,000	$40.00	$200,000.00
A2	Low Pressure Sewer Connections Including Tee, Curb Box, and Shut Off Valve, Complete in Place (ROW)	EA	21	$400.00	$8,400.00
A3	Simplex Grinder Pump Station w/ Electrical Connections and Alarm, Complete in Place	EA	21	$8,000.00	$168,000.00
A4	Special Crossings (PENNDOT): 6" Boring & Casing, complete in place	LF	225	$150.00	$33,750.00
A5	Permanent Township/Municipal Roadway Restoration, Complete in Place	SY	150	$50.00	$7,500.00
A6	State Road Shoulder Restoration, Complete in Place	SY	128	$70.00	$8,944.44
A7	Standard 4-foot Diameter Precast Concrete Manhole Including Clean-Outs as Required, Complete in Place (~1,000 ft Max.)	EA	6	$2,000.00	$12,000.00
A	**Subtotal A1 - A7**				**$438,594.44**
B1	Rock Drilling (20% of A1)				$40,000.00
B2	Mobilization & Demobilization (3% of A)				$13,157.83
B3	Erosion & Sedimentation Control (1% of A)				$4,385.94
B4	Work Zone Traffic Control (1% of A)				$4,385.94
B5	Construction Stakeout (1% of A)				$4,385.94
B6	Bonds & Insurances (1% of A)				$4,385.94
B	**Subtotal B1 - B6**				**$70,701.61**
AB	**Subtotal A & B**				**$509,296.06**
C1	Attorney Fee (5% of AB)				$25,464.80
C2	Engineering Fee (20% of AB)				$101,859.21
C3	Contingencies Fee (15% of AB)				$76,394.41
C	**Subtotal C1 - C3**				**$203,718.42**
D1	**Total (A+B+C)**				**$713,014.48**
D2	Future Cost Adjustments (3% of D1)				$21,390.43
D	**Grand Total (A+B+C)**				**$734,404.91**

LS - Lump sum; LF - Linear Foot; EA - Each; SY - Square Yard; ROW - Right-of-Way; gpd - gallon/day

1. Collection system layout & quantity estimates are taken from "The Regional Act 537 Sewage Facilities Plan" for West Penn Township and Walker Township report prepared by Ludgate Engineering Corporation in 2007.
2. Rock Drilling percentage has been assumed, as no soil study is performed.
3. Collection system is assumed to be primarily located with in roadway area.
4. Assumed a 5 % of the total forcemain length for road restoration for lateral connections and clean-outs.
5. Assumption of State Road Shoulder Restoration & Permanent Township/Municipal Roadway Restoration were based up on a 5 foot trench width.
6. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 4C

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Pumping/Treatment System Option A: Packaged Wastewater Treatment Plant
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 53 EDU's Average Flow = 15,900 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	16,000 gpd capacity BESST Packged Treatment Plant by Purestream with all Internal tank components (piping, valves, diffusers, mixers, clarifiers, Blowers, EQ Blower, Airlift Blowers; walkways, handrail, EQ Pumps, flow control box, and electrical control panel)	gal	16,000	$25.00	$400,000.00
A2	Emergency Generator	LS	1	$40,000.00	$40,000.00
A3	Packaged Treament Plant Site Excavation	CY	4,224	$5.00	$21,120.00
A4	Site Utilities & Appurtenances, including water, lighting, fencing, misc. piping, etc.	LS	1	$30,000.00	$30,000.00
A5	Electrical & Instrumentation Costs	LS	1	$15,000.00	$15,000.00
A	**Subtotal A1 - A5**				**$506,120.00**
B1	Rock Excavation (20% of A3)				$4,224.00
B2	Mobilization & Demobilization (3% of A)				$15,183.60
B3	Erosion & Sedimentation Control (3% of A)				$15,183.60
B4	Work Zone Traffic Control (1% of A)				$10,122.40
B5	Construction Stakeout (1% of A)				$5,061.20
B6	Bonds & Insurances (1% of A)				$5,061.20
B	**Subtotal B1 - B6**				**$54,836.00**
AB	**Subtotal A & B**				**$560,956.00**
C1	Attorney Fee (5% of AB)				$28,047.80
C2	Engineering Fee (20% of AB)				$112,191.20
C3	Contingencies Fee (15% of AB)				$84,143.40
C	**Subtotal C1 - C3**				**$224,382.40**
D1	**Total (A+B+C)**				**$785,338.40**
D2	Future Cost Adjustments (3% of D1)				$23,560.15
D3	Property Acquasition (1/2 Acre)				$15,000.00
D	**Grand Total**				**$823,898.55**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. The Biologically Engineered Single Sludge Treatment (BESST) system is type of package plant in which the wastewater flows up through a floating sludge blanket. The system consists of a complete activated sludge system furnished inside a single rectangular tank which will include an anoxic zone where influent wastewater is mixed with nitrified return activated sludge (RAS). Submersible mixers are located in the anoxic zones to increase the denitrification efficiency. After the anoxic zone, mixed liquor flows to the aeration zone. Aeration is provided by fine bubble diffusers which will allow for nitrification and biological oxygen demand (BOD) reduction.

2. Rock Excavation percentage has been assumed, as no soil study is performed.

3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site, the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs

4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 4D

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Pumping/Treatment System Option B: Pump Station & Discharge Forcemain to Clamtown Pump Station
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 53 EDU's Average Flow = 15,400 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Influent Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete in Place (16,000 gal)	gal	16,000	$7.00	$112,000.00
A2	3 -Inch Diameter HDPE DR 11 Discharge Forcemain to South Tamaqua Pump Station and Dicharge Forcemain Directional Drilling	LF	27,000	$40.00	$1,080,000.00
A3	Emergency Generator	LS	1	$40,000.00	$40,000.00
A4	Air Release Valve Vault, Complete In Place	EA	27	$3,000.00	$81,000.00
A5	Special Crossings (PENNDOT): 6" Boring & Casing, Complete in Place	LF	100	$200.00	$20,000.00
A6	Electrical & Instrumentation Costs	LS	1	$20,000.00	$20,000.00
A7	Upgrade for Clamtown, South Tamaqua Pump Station and Discharge Forcemain	LS	1	$15,000.00	$15,000.00
A	**Subtotal A1 - A7**				**$1,368,000.00**
B1	Rock Excavation (20% of A2)				$216,000.00
B2	Mobilization & Demobilization (3% of A)				$41,040.00
B3	Erosion & Sedimentation Control (3% of A)				$41,040.00
B4	Work Zone Traffic Control (1% of A)				$27,360.00
B5	Construction Stakeout (1% of A)				$13,680.00
B6	Bonds & Insurances (1% of A)				$13,680.00
B	**Subtotal B1 - B6**				**$352,800.00**
AB	**Subtotal A & B**				**$1,720,800.00**
C1	Attorney Fee (5% of AB)				$86,040.00
C2	Engineering Fee (20% of AB)				$344,160.00
C3	Contingencies Fee (15% of AB)				$258,120.00
C	**Subtotal C1 - C3**				**$688,320.00**
D1	**Total (A+B+C)**				**$2,409,120.00**
D2	Future Cost Adjustments (3% of D1)				$72,273.60
D3	Property Acquasition (1/4 Acre)				$10,000.00
D	**Grand Total**				**$2,491,393.60**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed , as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chossen site(s) location which will require additional cost consideration for final cost estimate.
3. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
4. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 4E

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Pumping/Treatment System Option C: Pump Station & Discharge Forcemain to Community Elevated Sand Mound System
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 53 EDU's Average Flow = 15,900 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Dosing Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete in Place (16,000 gal)	gal	16,000	$6.00	$96,000.00
A2	Emergency Generator	LS	1	$40,000.00	$40,000.00
A3	Septic Tanks (5000 tanks)	EA	5	$12,000.00	$60,000.00
A4	Filtration	LS	1	$62,500.00	$62,500.00
A5	Sandmounds	SF	43,560	$9.00	$392,040.00
A6	Electrical & Instrumentation Costs	LS	1	$20,000.00	$20,000.00
A7	Site Work	LS	1	$65,054.00	$65,054.00
A8	3 -Inch Diameter HDPE DR 11 Discharge Forcemain to Sandmounds	LF	1,000	$40.00	$40,000.00
A	**Subtotal A1 - A8**				**$775,594.00**
B1	Rock Excavation (20% of A8)				$8,000.00
B2	Mobilization & Demobilization (3% of A)				$23,267.82
B3	Erosion & Sedimentation Control (3% of A)				$23,267.82
B4	Work Zone Traffic Control (1% of A)				$15,511.88
B5	Construction Stakeout (1% of A)				$7,755.94
B6	Bonds & Insurances (1% of A)				$7,755.94
B	**Subtotal B1 - B6**				**$85,559.40**
AB	**Subtotal A & B**				**$861,153.40**
C1	Attorney Fee (5% of AB)				$43,057.67
C2	Engineering Fee (20% of AB)				$172,230.68
C3	Contingencies Fee (15% of AB)				$129,173.01
C	**Subtotal C1 - C3**				**$344,461.36**
D1	**Total (A+B+C)**				**$1,205,614.76**
D2	Future Cost Adjustments (3% of D1)				$36,168.44
D3	Property Acquasition (3 Acre)				$25,000.00
D	**Grand Total**				**$1,266,783.20**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon

1. Rock Excavation percentage has been assumed, as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chosen site(s) location which will require additional cost consideration for final cost estimate
3. Preliminary cost estimates prepared based upon similar bid costs from a Juniata County Project.
4. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
5. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 4F

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Pumping/Treatment System Option D: Pump Station & Discharge Forcemain to Community Drip Irrigation System
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 53 EDU's Average Flow = 15,900 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Dosing Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete In Place (16,000 gal)	gal	16,000	$6.00	$96,000.00
A2	Emergency Generator	LS	1	$40,000.00	$40,000.00
A3	Septic Tanks (5000 tanks)	EA	5	$12,500.00	$62,500.00
A4	Drip Fields	AC	6	$117,000.00	$702,000.00
A5	Electrical & Instrumentation Costs	LS	1	$40,000.00	$40,000.00
A6	Site Work	LS	1	$45,000.00	$45,000.00
A7	3 -inch Diameter HDPE DR 11 Discharge Forcemain to Drip Field	LF	1,000	$40.00	$40,000.00
A8	Filtration	LS	1	$62,512.00	$62,512.00
A	**Subtotal A1 - A8**				**$1,088,012.00**
B1	Rock Excavation (20% of AB)				$8,000.00
B2	Mobilization & Demobilization (3% of A)				$32,640.36
B3	Erosion & Sedimentation Control (3% of A)				$32,640.36
B4	Work Zone Traffic Control (1% of A)				$21,760.24
B5	Construction Stakeout (1% of A)				$10,880.12
B6	Bonds & Insurances (1% of A)				$10,880.12
B	**Subtotal B1 - B6**				**$116,801.20**
AB	**Subtotal A & B**				**$1,204,813.20**
C1	Attorney Fee (5% of AB)				$60,240.66
C2	Engineering Fee (20% of AB)				$240,962.64
C3	Contingencies Fee (15% of AB)				$180,721.98
C	**Subtotal C1 - C3**				**$481,925.28**
D1	**Total (A+B+C)**				**$1,686,738.48**
D2	Future Cost Adjustments (3% of D1)				$50,602.15
D3	Property Acquasition (8 Acre)				$50,000.00
D	**Grand Total**				**$1,787,340.63**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; gal - Gallon; AC - Acre

1. Rock Excavation percentage has been assumed , as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chossen site(s) location which will require additional cost consideration for final cost estimate.
3. Preliminary cost estimates prepared based upon similar bid costs from a Juniata County Project.
4. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site, the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
5. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 4G

West Penn Township Act 537 Plans Cost Estimate
Area 4: Snyders Service Area
Pumping/Treatment System Option E: Pump Station & Discharge Forcemain to Community Spray Irrigation System
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 Approximate 44 EDU's Average Flow = 13,200 gpd

Projected 20 Year Growth EDU's & Anticipated Average Sewage Flows

Approximate 53 EDU's Average Flow = 15,900 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Dosing Duplex Submersible Non-clog Pumping Station ,Wet Well, Valve Vault, Concrete Pad, Controls and Site Work, Complete In Place (16,000 gal)	gal	16,000	$6.00	$96,000.00
A2	Emergency Generator	LS	1	$35,000.00	$35,000.00
A3	Treatment/Storage Lagoon (230 days)	G	3,660,000	$0.15	$549,000.00
A4	Effluent Pump Station Controls	LS	1	$325,000.00	$325,000.00
A5	Electrical & Instrumentation Costs	LS	1	$40,000.00	$40,000.00
A6	3 -inch Diameter HDPE DR 11 Discharge Forcemain to Spray Fields	LF	1,000	$40.00	$40,000.00
A7	Filtration	LS	1	$62,512.00	$62,512.00
A	**Subtotal A1 - A7**				**$1,147,512.00**
B1	Rock Excavation (20% of A7)				$8,000.00
B2	Mobilization & Demobilization (3% of A)				$34,425.36
B3	Erosion & Sedimentation Control (3% of A)				$34,425.36
B4	Work Zone Traffic Control (1% of A)				$22,950.24
B5	Construction Stakeout (1% of A)				$11,475.12
B6	Bonds & Insurances (1% of A)				$11,475.12
B	**Subtotal B1 - B6**				**$122,751.20**
AB	**Subtotal A & B**				**$1,270,263.20**
C1	Attorney Fee (5% of AB)				$63,513.16
C2	Engineering Fee (20% of AB)				$254,052.64
C3	Contingencies Fee (15% of AB)				$190,539.48
C	**Subtotal C1 - C3**				**$508,105.28**
D1	**Total (A+B+C)**				**$1,778,368.48**
D2	Future Cost Adjustments (3% of D1)				$53,351.05
D3	Property Acquasition (10 Acre)				$60,000.00
D	**Grand Total**				**$1,891,719.53**

LS - Lump sum; LF - Linear Foot; SF - Square Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day; AC - Acre; G - Gallon

1. Rock Excavation percentage has been assumed , as no soil study is performed.
2. At this time discharge forcemain length is an approximate estimate to one single study area, actual length will may change depending on chossen site(s) location which will require additional cost consideration for final cost estimate.
3. Preliminary cost estimates prepared based upon similar bid costs from a Juniata County Project.
4. RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site, the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.
5. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

EXHIBIT R - XI - 4H

West Penn Township Act 537 Update
Area 4: Snyders Service Area
Treatment System Present worth Analysis for 40 Years
RETTEW Project No: 08-03486-005
July 15, 2011

Existing EDU's & Anticipated Average Sewage Flows

# of Approximate Connections - 21 imate 44 EDU's Average Flow = 13,200 gpd

Design Flow = 16,000 gpd

No.	Description	Option A Packaged Wastewater Treatment Plant [1]	Option B Pump Station & Discharge Forcemain to Tamaqua WWTP	Option C Pump Station & Discharge Forcemain to Community Elevated Sand Mound System	Option D Pump Station & Discharge Forcemain to Community Drip Irrigation System	Option E Pump Station & Discharge Forcemain to Community Spray Irrigation System
1	Treatment Alternative Capital Costs	$823,899	$2,491,394	$1,266,783	$1,787,341	$1,891,720
2	Approximate Annual Electrical Costs	$6,000	$1,200	$1,200	$2,000	$2,000
3	Approximate Annual Contract O&M Costs [2]	$25,000	$5,000	$5,000	$25,000	$25,000
4	Approximate Annual Sludge Hauling Costs	$7,000	N/A	$4,500	$4,500	$4,500
5	TBSA Tapping Fee [3]	N/A	$88,000	N/A	N/A	N/A
6	TBSA WWTP Annual Treatment Fees [4]	N/A	$10,120	N/A	N/A	N/A
7	Interest rate for Present Worth Calculations	3.0%	3.0%	3.0%	3.0%	3.0%
8	Present Worth of Annual Electrical Costs	$138,688.63	$27,737.73	$27,737.73	$46,229.54	$46,229.54
9	Present Worth of Annual Contract O&M Costs	$577,869.30	$115,573.86	$115,573.86	$577,869.30	$577,869.30
10	Present Worth of Sludge Hauling Costs	$161,803.40	N/A	$104,016.47	$104,016.47	$104,016.47
11	Present Worth of Annual Treatment Fee [3]	N/A	$233,921.49	N/A	N/A	N/A
	TOTAL ESTIMATED PRESENT WORTH PROJECT COSTS	$1,702,260	$2,868,627	$1,514,111	$2,515,456	$2,619,835

1. Treatment Plant system is based on the following assumptions: Influent BOD & TSS =300 mg/l, 300mg/l, NH3-N=20mg/l, P=10mg/l; Effluent BOD & TSS=20/25 mg/l, NH3-N=3 to 9 mg/l, P=N/A, D.O =5mg/l, TRC=0.5 mg/l

2. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.

3. Tamaqua Borough Sewer Authority Tapping fee of $2000 per EDU spread over a 20 year period.

4. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

5. Present Value or Worth = PV; Annual Costs = A; Interest Rate = I; Number of Years = n

$$PV = A \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

6. Property Acquisition cost is preliminary and must be re-evaluated during pre-design phase.

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R - XI - 5A

West Penn Township Act 537 Update
Project Capital Cost Financial Analysis With 45% USDA-RUS Grant
RETTEW Project No: 08-03486-005
July 15, 2011

Total Existing EDU's = 306

No.	Service Area	# of Connections	# of EDU'S	Best Collection System Capital Costs ($)	Best Treatment System Capital Costs ($)	Best Collection & Treatment System Capital Costs Total ($)	Total Annual Electrical, O&M, and Sludge Hauling Costs ($)	20 Year Annual Payments for TBSA Tapping Fee ($)	Annual Payments for TBSA Treatment Fee ($)
1	Area 1: South Tamaqua Service Area	66	79	$ 1,613,583.00	$ 1,382,190.00	$ 2,995,773.00	$ 6,500.00	$ 7,900.00	$ 18,170.00
2	Area 2a: Clamtown Service Area and Area 2b: Reynolds Service Area	128	131	$ 3,373,440.00	$ 1,274,490.00	$ 4,647,930.00	$ 7,500.00	$ 13,100.00	$ 30,130.00
3	Area 3: Andreas Service Area	40	52	$ 844,712.00	$ 984,993.00	$ 1,829,705.00	$ 38,000.00	N/A	N/A
4	Area 4: Snyders Service Area	21	44	$ 734,405.00	$ 1,266,783.00	$ 2,001,188.00	$ 10,700.00	N/A	N/A
	TOTAL	**255**	**306**	**$ 6,566,140.00**	**$ 4,908,456.00**	**$ 11,474,596.00**	**$ 62,700.00**	**$ 21,000.00**	**$ 48,300.00**

Total Number of EDU's in Project Area	#	306
Total Project Costs	$	11,474,596.00
45 % RUS Grant Application for Total Capital Costs	$	5,163,568.20
Total Estimated Sewer Connection Tapping Fee Charges @ $1500 Per EDU	$	459,000.00
Finance Amount Needed for Capital Costs	$	5,852,027.80
Annual RUS Debt Service Payment for Financed Amount @ 2.875% for 40 Years	$	248,082.40
Annual Operational Expenses for Complete Project Area	$	132,000.00
Annual Costs for Debt Service & Operational Expenses per EDU	**$**	**1,242.10**
Montly Costs for per EDU Without Authority Adminstration Fee	$	103.51

1. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.
2. Tamaqua Borough Sewer Authority Tapping fee of $2000 per EDU spread over a 20 year period.
3. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

EXHIBIT R - XI - 5B

West Penn Township Act 537 Update
Project Capital Cost Financial Analysis With 75% USDA-RUS Grant
RETTEW Project No: 08-03486-005
July 15, 2011

Total Existing EDU's = 306

No.	Service Area	# of Connections	# of EDU'S	Best Collection System Capital Costs ($)	Best Treatment System Capital Costs ($)	Best Collection & Treatment System Capital Costs Total ($)	Total Annual Electrical, O&M, and Sludge Hauling Costs ($)	20 Year Annual Payments for TBSA Tapping Fee ($)	Annual Payments for TBSA Treatment Fee ($)
1	Area 1: South Tamaqua Service Area	66	79	$ 1,613,583.00	$ 1,382,190.00	$ 2,995,773.00	$ 6,500.00	$ 7,900.00	$ 18,170.00
2	Area 2a: Clamtown Service Area and Area 2b: Reynolds Service Area	128	131	$ 3,373,440.00	$ 1,274,490.00	$ 4,647,930.00	$ 7,500.00	$ 13,100.00	$ 30,130.00
3	Area 3: Andreas Service Area	40	52	$ 844,712.00	$ 984,993.00	$ 1,829,705.00	$ 38,000.00	N/A	N/A
4	Area 4: Snyders Service Area	21	44	$ 734,405.00	$ 1,266,783.00	$ 2,001,188.00	$ 10,700.00	N/A	N/A
	TOTAL	255	306	$ 6,566,140.00	$ 4,908,456.00	$ 11,474,596.00	$ 62,700.00	$ 21,000.00	$ 48,300.00

Total Number of EDU's in Project Area	#	306
Total Project Costs	$	11,474,596.00
75 % RUS Grant Application for Total Capital Costs	$	8,605,947.00
Total Estimated Sewer Connection Tapping Fee Charges @ $1500 Per EDU	$	459,000.00
Finance Amount Needed for Capital Costs	$	2,409,649.00
Annual RUS Debt Service Payment for Financed Amount @ 2.875% for 40 Years	$	102,151.17
Annual Operational Expenses for Complete Project Area	$	132,000.00
Annual Costs for Debt Service & Operational Expenses per EDU	**$**	**765.20**
Montly Costs for per EDU Without Authority Adminstration Fee	$	63.77

1. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.
2. Tamaqua Borough Sewer Authority Tapping fee of $2000 per EDU spread over a 20 year period.
3. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

EXHIBIT R - XI - 5C

West Penn Township Act 537 Update
Project Capital Cost Financial Analysis With 50% PennVEST Grant
RETTEW Project No: 08-03486-005
July 15, 2011

Total Existing EDU's = 306

No.	Service Area	# of Connections	# of EDU'S	Best Collection System Capital Costs ($)	Best Treatment System Capital Costs ($)	Best Collection & Treatment System Capital Costs Total ($)	Total Annual Electrical, O&M, and Sludge Hauling Costs ($)	20 Year Annual Payments for TBSA Tapping Fee ($)	Annual Payments for TBSA Treatment Fee ($)
1	Area 1: South Tamaqua Service Area	66	79	$ 1,613,583.00	$ 1,382,190.00	$ 2,995,773.00	$ 6,500.00	$ 7,900.00	$ 18,170.00
2	Area 2a: Clamtown Service Area and Area 2b: Reynolds Service Area	128	131	$ 3,373,440.00	$ 1,274,490.00	$ 4,647,930.00	$ 7,500.00	$ 13,100.00	$ 30,130.00
3	Area 3: Andreas Service Area	40	52	$ 844,712.00	$ 984,993.00	$ 1,829,705.00	$ 38,000.00	N/A	N/A
4	Area 4: Snyders Service Area	21	44	$ 734,405.00	$ 1,266,783.00	$ 2,001,188.00	$ 10,700.00	N/A	N/A
	TOTAL	255	306	$ 6,566,140.00	$ 4,908,456.00	$ 11,474,596.00	$ 62,700.00	$ 21,000.00	$ 48,300.00

Total Number of EDU's In Project Area	#	306
Total Project Costs	$	11,474,596.00
50 % PennVEST Grant Application for Total Capital Costs*	$	5,737,298.00
Total Estimated Sewer Connection Tapping Fee Charges @ $1500 Per EDU	$	459,000.00
Finance Amount Needed for Capital Costs	$	5,278,298.00
Annual PennVEST Debt Service Payment for Financed Amount @ 1.512% for years 1-5 and then 3.024% for years 6-20 (Ave 2.64% Rate)	$	487,331.67
Annual Operational Expenses for Complete Project Area	$	132,000.00
Annual Costs for Debt Service & Operational Expenses per EDU	**$**	**2,023.96**
Montly Costs for per EDU Without Authority Adminstration Fee	$	168.66

*Note: PennVEST Does Not Recommend Anticipating Grant Funds for Planning.

1. The O & M costs include: Lab tests, certified operator, chemicals, and misc. maintenance.
2. Tamaqua Borough Sewer Authority Tapping fee of $2000 per EDU spread over a 20 year period.
3. Tamaqua WWTP Treatment fee of $230 per EDU/yr with an approximate 3% increase each year.

EXHIBIT R-XI-6
West Penn Township Act 537 Plan Cost Opinion
Area 1: South Tamaqua Service Area
Septic Tank/Low Pressure with Drip Irrigation
RETTEW Project No: 08-03486-005
May 2013

# of Approximate Connections - 12 Approximate 12 EDUs Design Flow = 5,000 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Low Pressure Main	LF	1,120	$40.00	$44,800.00
A2	Low Pressure Terminal Clean-out Manholes	EA	3	$4,000.00	$12,000.00
A3	Septic Tank	EA	12	$2,500.00	$30,000.00
A4	Road Restoration	LF	1,120	$25.00	$28,000.00
A5	Drip Irrigation System	LS	1	$120,000.00	$120,000.00
A	**Subtotal A1 - A5**				**$234,800.00**
B1	Mobilization & Demobilization (2% of A)				$4,696.00
B2	Erosion & Sedimentation Control (1% of A)				$2,348.00
B3	Work Zone Traffic Control (2% of A)				$4,696.00
B4	Construction Stakeout (1% of A)				$2,348.00
B5	Bonds & Insurances (1% of A)				$2,348.00
B	**Subtotal B1 - B5**				**$16,436.00**
AB	**Subtotal A & B**				**$251,236.00**
C1	Attorney Fee (5% of AB)				$12,561.80
C2	Engineering Fee (15% of AB)				$37,685.40
C3	Contingencies Fee (10% of AB)				$25,123.60
C4	ROW and Property				$40,000.00
C	**Subtotal C1 - C4**				**$115,370.80**
D	**Grand Total (A+B+C)**				**$366,606.80**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R-XI-7
West Penn Township Act 537 Plans Cost Opinion
Area 2a: Clamtown Service Area
Septic Tank/Low Pressure Sewer with Drip Irrigation
RETTEW Project No: 08-03486-005
May 2013

# of Approximate Connections - 4 Approximate 4 EDUs Design Flow = 1,500 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Low Pressure Main	LF	500	$40.00	$20,000.00
A2	Low Pressure Terminal Clean-out Manholes	EA	2	$4,000.00	$8,000.00
A3	Septic Tank	EA	4	$2,500.00	$10,000.00
A4	Road Restoration	LF	500	$25.00	$12,500.00
A5	Drip Irrigation System	LS	1	$51,000.00	$51,000.00
A	**Subtotal A1 - A5**				**$101,500.00**
B1	Mobilization & Demobilization (2% of A)				$2,030.00
B2	Erosion & Sedimentation Control (1% of A)				$1,015.00
B3	Work Zone Traffic Control (2% of A)				$2,030.00
B4	Construction Stakeout (1% of A)				$1,015.00
B5	Bonds & Insurances (1% of A)				$1,015.00
B	**Subtotal B1 - B5**				**$7,105.00**
AB	**Subtotal A & B**				**$108,605.00**
C1	Attorney Fee (5% of AB)				$5,430.25
C2	Engineering Fee (15% of AB)				$16,290.75
C3	Contingencies Fee (15% of AB)				$16,290.75
C4	ROW and Property				$15,000.00
C	**Subtotal C1 - C4**				**$53,011.75**
D	**Grand Total (A+B+C)**				**$161,616.75**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R-XI-8
West Penn Township Act 537 Plans Cost Opinion
Area 2b: Reynolds Service Area
Septic Tank/Low Pressure Sewer with Drip Irrigation
RETTEW Project No: 08-03486-005
May 2013

# of Approximate Connections - 6 | Approximate 6 EDUs | Design Flow = 2,400 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Low Pressure Main	LF	600	$40.00	$24,000.00
A2	Low Pressure Terminal Clean-out Manholes	EA	2	$4,000.00	$8,000.00
A3	Septic Tank	EA	6	$2,500.00	$15,000.00
A4	Road Restoration	LF	600	$25.00	$15,000.00
A5	Drip Irrigation System	LS	1	$72,000.00	$72,000.00
A	**Subtotal A1 - A5**				**$134,000.00**
B1	Mobilization & Demobilization (2% of A)				$2,680.00
B2	Erosion & Sedimentation Control (1% of A)				$1,340.00
B3	Work Zone Traffic Control (2% of A)				$2,680.00
B4	Construction Stakeout (1% of A)				$1,340.00
B5	Bonds & Insurances (1% of A)				$1,340.00
B	**Subtotal B1 - B5**				**$9,380.00**
AB	**Subtotal A & B**				**$143,380.00**
C1	Attorney Fee (5% of AB)				$7,169.00
C2	Engineering Fee (15% of AB)				$21,507.00
C3	Contingencies Fee (15% of AB)				$21,507.00
C4	ROW and Property				$20,000.00
C	**Subtotal C1 - C4**				**$70,183.00**
D	**Grand Total (A+B+C)**				**$213,563.00**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R-XI-9
Walker Township Act 537 Plan Cost Opinion
Area 3: Andreas Service Area
Septic Tank/Low Pressure Sewer with Drip Irrigation
RETTEW Project No: 08-03486-005
May 2013

# of Approximate Connections - 6 | Approximate 6 EDUs | Design Flow = 2,400 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Low Pressure Main	LF	500	$40.00	$20,000.00
A2	Low Pressure Terminal Clean-out Manholes	EA	2	$4,000.00	$8,000.00
A3	Septic Tank	EA	6	$2,500.00	$15,000.00
A4	Road Restoration	LF	500	$25.00	$12,500.00
A5	Drip Irrigation System	LS	1	$72,000.00	$72,000.00
A	**Subtotal A1 - A5**				**$127,500.00**
B1	Mobilization & Demobilization (2% of A)				$2,550.00
B2	Erosion & Sedimentation Control (1% of A)				$1,275.00
B3	Work Zone Traffic Control (2% of A)				$2,550.00
B4	Construction Stakeout (1% of A)				$1,275.00
B5	Bonds & Insurances (1% of A)				$1,275.00
B	**Subtotal B1 - B5**				**$8,925.00**
AB	**Subtotal A & B**				**$136,425.00**
C1	Attorney Fee (5% of AB)				$6,821.25
C2	Engineering Fee (15% of AB)				$20,463.75
C3	Contingencies Fee (15% of AB)				$20,463.75
C4	ROW and Property				$20,000.00
C	**Subtotal C1 - C4**				**$67,748.75**
D	**Grand Total (A+B+C)**				**$204,173.75**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R-XI-10
West Penn Township Act 537 Plan Cost Opinion
Area 4: Snyders Service Area
Septic Tank/Low Pressure Sewer with Drip Irrigation
RETTEW Project No: 08-03486-005
May 2013

# of Approximate Connections - 2 | Approximate 2 EDUs | Design Flow = 800 gpd

#	Item	Unit	Quantity	Unit Cost	Extended Cost
A1	Low Pressure Main	LF	300	$40.00	$12,000.00
A2	Low Pressure Terminal Clean-out Manholes	EA	1	$4,000.00	$4,000.00
A3	Septic Tank	EA	2	$2,500.00	$5,000.00
A4	Road Restoration	LF	100	$25.00	$2,500.00
A5	Drip Irrigation System	LS	1	$27,000.00	$27,000.00
A	**Subtotal A1 - A5**				**$50,500.00**
B1	Mobilization & Demobilization (2% of A)				$1,010.00
B2	Erosion & Sedimentation Control (1% of A)				$505.00
B3	Work Zone Traffic Control (2% of A)				$1,010.00
B4	Construction Stakeout (1% of A)				$505.00
B5	Bonds & Insurances (1% of A)				$505.00
B	**Subtotal B1 - B5**				**$3,535.00**
AB	**Subtotal A & B**				**$54,035.00**
C1	Attorney Fee (5% of AB)				$2,701.75
C2	Engineering Fee (15% of AB)				$8,105.25
C3	Contingencies Fee (15% of AB)				$8,105.25
C4	ROW and Property				$10,000.00
C	**Subtotal C1 - C4**				**$28,912.25**
D	**Grand Total (A+B+C)**				**$82,947.25**

LS - Lump sum; LF - Linear Foot; EA - Each; ROW - Right-of-Way; gpd - gallon/day

RETTEW Associates, Inc. is not a construction contractor and therefore probable construction cost opinions are based solely upon our experience with construction. This requires RETTEW to make a number of assumptions as to actual conditions which will be encountered on the site; the specific decisions of other design professionals engaged; the means and methods of construction the contractor will employ; contractors' techniques in determining prices and market conditions at the time, and other factors over which RETTEW has no control. Given these assumptions which must be made, RETTEW states that the above probable construction cost opinion is a fair and reasonable estimate for construction costs.

EXHIBIT R-XI-11
West Penn Township Act 537 Update
Project Capital Cost Financial Analysis With 45% USDA-RUS Grant
RETTEW Project No: 08-03486-005
May 2013

No.	Service Area	# of EDUs	Community On-Lot Disposal System Capital Costs ($)
1	Area 1: South Tamaqua Service Area	12	$ 366,606.80
2a	Area 2a: Clamtown Service Area	4	$ 161,616.75
2b	Area 2b: Reynolds Service Area	6	$ 213,563.00
3	Area 3: Andreas Service Area	6	$ 204,173.75
4	Area 4: Snyders Service Area	2	$ 82,947.25
	TOTAL	**30**	**$ 1,028,907.55**

Total Number of EDUs in Project Area		30
Total Project Costs	$	1,028,907.55
45% RUS Grant Application for Total Capital Costs	$	463,008.40
Total Estimated Sewer Connection Tapping Fee Charges @ $1,500 Per EDU	$	45,000.00
Finance Amount Needed for Capital Costs	$	520,899.15
Annual RUS Debt Service Payment for Financed Amount @ 2.75% for 40 Years	$	21,633.73
Annual Operational Expenses for Complete Project Area	$	5,000.00
Annual Costs for Debt Service & Operational Expenses per EDU	**$**	**887.79**
Monthly Costs per EDU Without Authority Administration Fee	$	73.98

EXHIBIT R-XI-12
West Penn Township Act 537 Update
Individual Solution Capital Cost Financial Analysis With & Without USDA-RUS Grant
RETTEW Project No: 08-03486-005
May 2013

Individual On-Lot Replacement Sand Mound Total Project Costs	$	15,000.00
Low Income RUS Grant Application for Total Capital Costs		n/a
Finance Amount Needed for Capital Costs	$	15,000.00
Annual RUS Debt Service Payment for Financed Amount @ 2.75% for 20 Years	$	985.08
Monthly Costs per EDU Without Authority Administration Fee	$	82.09

Individual On-Lot Replacement Sand Mound Total Project Costs	$	20,000.00
Low Income RUS Grant Application for Total Capital Costs		n/a
Finance Amount Needed for Capital Costs	$	20,000.00
Annual RUS Debt Service Payment for Financed Amount @ 2.75% for 20 Years	$	1,313.43
Monthly Costs per EDU Without Authority Administration Fee	$	109.45

Individual On-Lot Replacement Sand Mound Total Project Costs	$	15,000.00
Low Income RUS Grant Application for Total Capital Costs	$	7,500.00
Finance Amount Needed for Capital Costs	$	7,500.00
Annual RUS Debt Service Payment for Financed Amount @ 2.75% for 20 Years	$	415.61
Monthly Costs per EDU Without Authority Administration Fee	$	34.63

Individual On-Lot Replacement Sand Mound Total Project Costs	$	20,000.00
Low Income RUS Grant Application for Total Capital Costs	$	7,500.00
Finance Amount Needed for Capital Costs	$	12,500.00
Annual RUS Debt Service Payment for Financed Amount @ 2.75% for 20 Years	$	692.69
Monthly Costs per EDU Without Authority Administration Fee	$	57.72