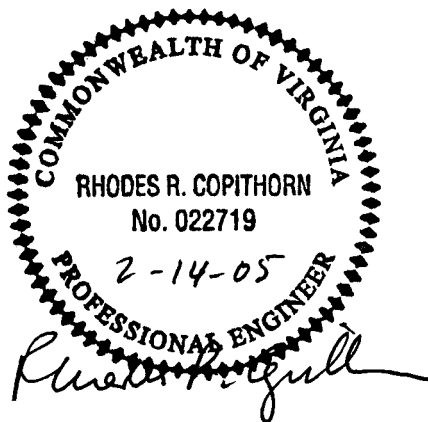


**Route 122/Moneta
Sewage Collection and Treatment System
Feasibility Study
Addendum No. 1**

Bedford, Virginia

Prepared for the

**Bedford County
Public Service Authority**



Prepared by



Stearns & Wheler, LLC
Environmental Engineers and Scientists

310 First Street, SW, Ste. 405
Roanoke, VA 24003

S&W Project No. 40192
BCPSA JN 2004-112

Original Study Issued: September 2004
Addendum No. 1 Issued: February 2005

Executive Summary

This addendum to the September 2004 feasibility study is to evaluate the feasibility of locating the wastewater treatment plant on Bedford County's "Camp 24" property (76± acre site), which is located on Route 654. This addendum includes evaluating the sewage collection system modifications necessary to pump raw wastewater from the Aznavorian property to the treatment plant site near "Camp 24", and then discharging the treated effluent to Hunting Creek.

The collection system evaluated in this addendum generally follows the natural drainage along Hunting Creek. Areas not able to flow by gravity are served by pump stations along with influent pump stations to convey the raw wastewater to the proposed site and an effluent pump station for discharging the treated effluent to Hunting Creek.

Effluent from the proposed WWTP would be discharged to Hunting Creek, a tributary to Goose Creek. Discharge limits to Hunting Creek could range from 15/15 (BOD/TSS) to as low as 5/5 and Public Water Standards (PWS) may apply to the facility.

Conclusions for collection system modifications and a wastewater treatment plant on Bedford County's "Camp 24" property (Parcel 233-A-40B) for the Route 122/Moneta service area include the following:

1. Construction of a WWTP on Bedford County's "Camp 24" property on Route 654 appears feasible and the property is of adequate size (76 acres±) to meet the needs of a proposed WWTP.
2. Buffer requirements (15 acres± total) for the facility limit site location on the property due to adjacent "Camp 24", VDOT, and BCPSA properties.
3. The Aznavorian property (Parcel 222-A-10F, 30± acre site) and Bedford County's "Camp 24" property (Parcel 233-A-40B, 76± acre site) are of adequate size for the placement of a proposed WWTP for the BCPSA.

4. A collection system consisting of gravity sewer, pump stations, and force mains is feasible for the Route 122/Moneta service area. The collection system can serve part of the service area by gravity with the remaining areas served by pump stations.
5. The Influent flow to the proposed WWTP, as situated on the “Camp 24” property, will consist of two pump stations in order to convey projected flows to the site.
6. The Effluent pump station will consist of a pump station and force main for conveying treated effluent from the proposed WWTP to Hunting Creek.
7. The construction cost of a collection system and a 0.5 mgd WWTP on Bedford County’s property near “Camp 24” is estimated to be approximately \$16.4 million and \$4.3 million respectively.
8. The construction cost of a collection system and a 0.5 mgd WWTP on the Aznavorian property is estimated to be approximately \$11.0 million and \$4.3 million respectively.

Recommendations for collection system modifications and a wastewater treatment plant on Bedford County’s “Camp 24” property (Parcel 233-A-40B) for the Route 122/Moneta service area include the following:

1. The BCPSA should consider both the Aznavorian property and Bedford County’s property as viable options for WWTP location to serve the Route 122/Moneta service area.
2. Based on the information obtained and presented in this report, one of the properties has a higher capital investment than the other, which may impact WWTP location.
3. If the “Camp 24” site location is pursued further, additional research and analysis should be performed on WWTP location and infrastructure needed to convey wastewater to the plant.

The preliminary opinion of probable construction cost for Phase I of the collection system with a WWTP would range from \$3.9 to \$9.8 million dollars depending on which

site is selected. Preliminary opinion of probable construction cost for a 0.5 mgd WWTP is \$4.3 million dollars with an overall cost ranging from \$8.2 to \$14.1 million dollars for Phase I of the Route 122/Moneta collection and treatment system.

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Section 1

Introduction

1.1 Purpose

Stearns & Wheler was retained by the Bedford County Public Service Authority (BCPSA) to prepare an addendum to the Route 122/Moneta Sewage Collection and Treatment System Feasibility Study issued in September 2004. The addendum included a brief evaluation of a wastewater treatment plant placed on Bedford County's property (76± acre site) near "Camp 24" in Moneta and sewage collection system modifications necessary to pump raw wastewater from the Aznavorian property to the treatment plant site near "Camp 24" and discharging the treated effluent to Hunting Creek.

1.2 Scope of Study

The objectives of the study were the following:

1. Evaluate the feasibility of locating a wastewater treatment plant on Bedford County's property (Parcel 233-A-40B, 76± acre site) and discharging to Hunting Creek as compared to the Aznavorian property as described in the Route 122/Moneta Sewage Collection and Treatment System Feasibility Study (dated September 2004).
2. Evaluate sewage collection system modifications necessary to pump the raw wastewater from the Aznavorian property to the proposed wastewater treatment plant site near "Camp 24" and discharging the treated effluent to Hunting Creek.
3. Prepare conceptual level of effort opinions of probable cost for the sewage collection and treatment system for the Route 122/Moneta Service Area.

1.3 Organization of Report

The Feasibility Study is organized as follows:

- Section 1 Introduction: Presents the purpose and objectives of the evaluation and scope of the study.
- Section 2 Collection System Evaluation: Evaluates proposed sewage collection system(s) modifications for transferring raw wastewater and treated effluent from the proposed wastewater treatment plant near “Camp 24”.
- Section 3 Wastewater Treatment Facility Evaluation: Provides a brief evaluation of a wastewater treatment facility on Bedford County’s property near “Camp 24” in Moneta.
- Section 4 Opinions of Probable Project Cost: Summarizes opinions of probable project cost for sewage collection modifications for the proposed wastewater treatment plant site.
- Section 5 Summary and Recommendations: Presents a summary of the study and provides recommendations for future planning needs of the Route 122/Moneta service area.

Section 2

Collection System Evaluation

2.1 General

The collection system (main interceptor) developed in the September 2004 feasibility study generally follows the natural drainage along Hunting Creek to Route 655 (Hendricks Store Road) while pump stations in the drainage basins at Smith Mountain Lake allow for flows to be conveyed from developments at the lake to the interceptor line along Hunting Creek.

The conceptual layout of the sewage collection system presented in the September 2004 feasibility study is used in this study except for the addition of pump stations and force mains necessary to convey raw wastewater and treated effluent from the proposed wastewater treatment plant site near “Camp 24”, which lies in the Mattox Creek drainage basin adjacent to the Hunting Creek drainage basin. The pump station and force main proposed to transfer wastewater from “Camp 24” to the gravity system in the September 2004 feasibility study was eliminated due to the plant site moving near “Camp 24”. Figure 2.1-1 presents the conceptual layout of the sewage collection system.

Facilities for the sewage collection system consist of 8, 12, 15, 18, and 21-inch gravity sewers, 2, 6, 8, 10, and 15-inch force mains, and six pump stations. The collection system presented in this report should be re-evaluated as more detailed information on local soil conditions, topography, and stream flows in the service area becomes available.

Section 3

Wastewater Treatment Facility Evaluation

3.1 General

For purposes of this addendum, a wastewater treatment facility to serve the Route 122/Moneta service area would be located on Bedford County's "Camp 24" property (Parcel 233-A-40B) along State Route 654 (Radford Church Road). Estimated average annual flow projections used in the September 2004 feasibility study for anticipated wastewater treatment plant capacities were also used.






Bedford County's property, a 76± acre site along State Route 654 behind "Camp 24", the Virginia Department of Transportation, and BCPSA's elevated water storage tank, appears to provide adequate space for the proposed WWTP as shown in Figure 3.1-1. The proposed plant site would be situated behind the BCPSA's elevated water storage tank along State Route 654.

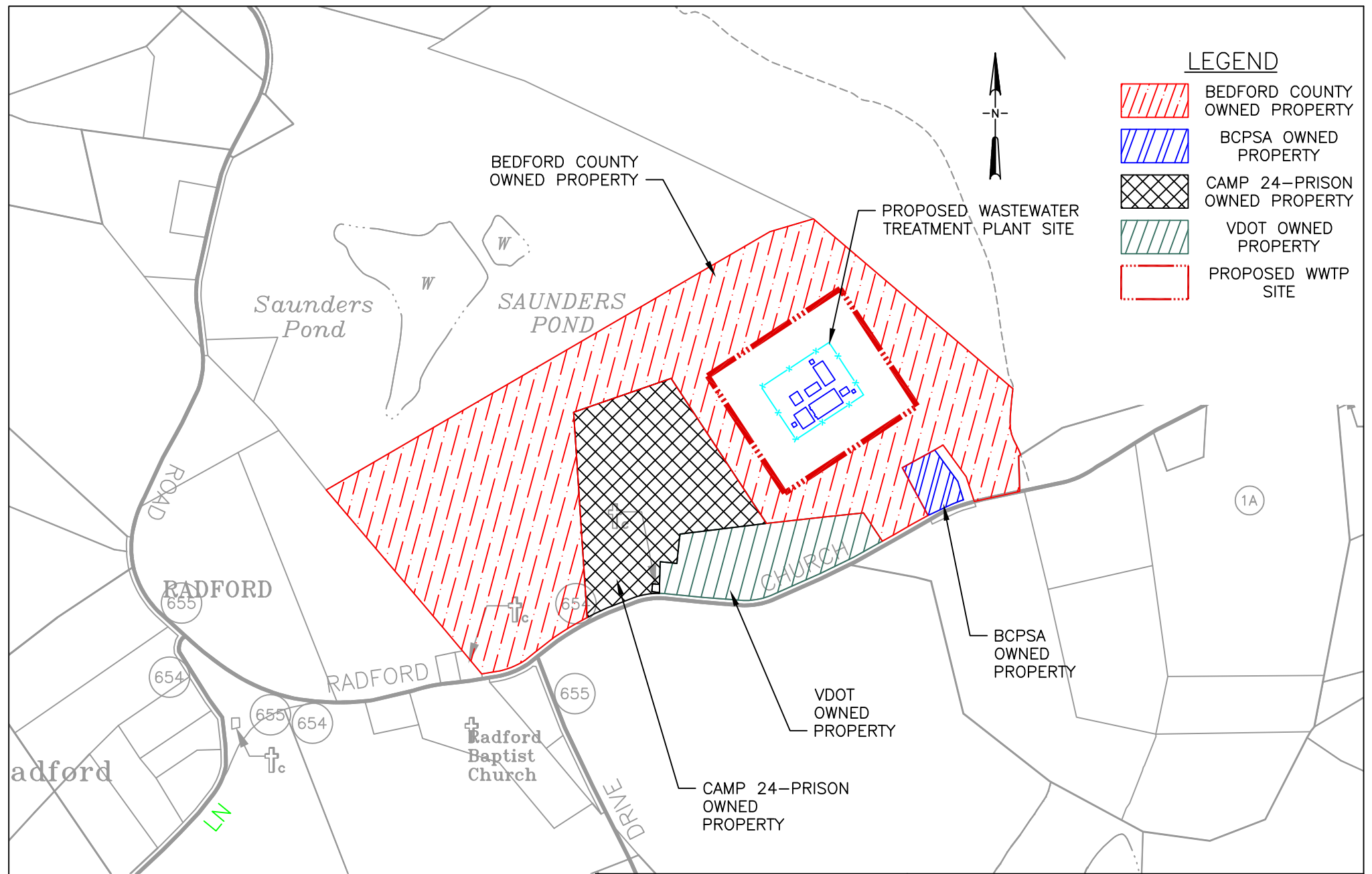
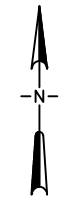
The Virginia Department of Environmental Quality (DEQ) has indicated to the BCPSA during previous wastewater treatment plant discussions that a 200-foot buffer may be required. An estimated plant area of 5 acres with up to a 300-foot buffer could be situated at this site. If buffer requirements exceed approximately 300-foot, the plant location may need to be adjusted and additional land would have to be purchased from surrounding property owners.

Effluent from the proposed plant, for purposes of this addendum, would be discharged to Hunting Creek, a tributary to Goose Creek, which confluences with the Roanoke River downstream of Leesville Dam. Effluent from the plant would have to be pumped in order for it to discharge to Hunting Creek. Discharge limits ranging from 15/15 (BOD/TSS) to 5/5 could be required along with Public Water Standards (PWS) for the proposed facility. Should PWS apply for the plant, the requirements discussed in the September 2004 feasibility study would be required.

Placing a treatment plant on Bedford County's property near "Camp 24" would still require a facility capable of treating a wide range of flows and being able to provide advanced tertiary treatment, which would include biological treatment followed by effluent filtration. The treatment processes evaluated in the September 2004 feasibility study are viable options for the "Camp 24" site evaluated in this addendum.

LEGEND

-  BEDFORD COUNTY OWNED PROPERTY
-  BCPSA OWNED PROPERTY
-  CAMP 24-PRISON OWNED PROPERTY
-  VDOT OWNED PROPERTY
-  PROPOSED WWTP SITE



Stearns & Wheeler, LLC
Environmental Engineers and Scientists

ROANOKE, VIRGINIA

DATE: 02/05 JOB No.:40192

BEDFORD COUNTY PUBLIC SERVICE AUTHORITY
BCPSA JOB # 2004-112
ROUTE 122/MONETA SEWER FEASIBILITY ADDENDUM NO 1

FIGURE 3.1-1
RT 122/MONETA SEWER SYSTEM
PROPOSED SITE PLAN

TAX_MAPS, 40192-ADNDM-XREF
09/04, Roanoke, BSR
J:\Roanoke Jobs\Bedford VA\40192\10\Drawings\Fig\Addendum Figs\Addendum Fig 3.1-1

Section 4

Opinions of Probable Project Cost

4.1 General

Preliminary construction costs for Phases III, and IV from the September 2004 feasibility study did not change as a result of the sewage collection system modifications made in this study. Phase I preliminary construction costs were updated from the September 2004 feasibility study to include property acquisition for the wastewater treatment plant site on the Aznavorian property. Preliminary opinions of probable construction costs associated with the Route 122/Moneta sewage collection system are summarized in Tables 4.1-1 and 4.1-2.

Table 4.1-1: Preliminary Opinions of Probable Construction Costs at Aznavorian Site

Collection System	Construction Cost
Phase I	3.9 million
Phase II	0.8 million
Phase III	2.5 million
Phase IV	3.8 million
Total	11.0 million

Table 4.1-2: Preliminary Opinions of Probable Construction Costs at “Camp 24” Site

Collection System	Construction Cost
Phase I	9.8 million
Phase II	0.3 million
Phase III	2.5 million
Phase IV	3.8 million
Total	16.4 million

Property for the plant site will be donated to the BCPSA, but property needed for buffer requirements must be purchased. The buffer required around the proposed plant is approximately 10 acres. A preliminary cost of \$5,000 per acre was used to estimate the cost incurred by the BCPSA for the additional land. The total preliminary construction cost for the land acquisition was approximately \$50,000 and increased the overall estimate from the September 2004 study by approximately \$100,000, which brought the Phase I preliminary construction cost to approximately \$3.9 million.

Phase II preliminary construction costs were updated to reflect the removal of the “Camp 24” pump station, force main, and associated appurtenances as a result of the plant location at Bedford County’s “Camp 24” property.

Table 4.1-2 presents the preliminary construction cost for the sewage collection system with the facilities necessary to have the wastewater treatment plant near “Camp 24”. The preliminary construction cost is approximately \$16.4 million dollars, which is approximately \$5.4 million more than the estimate provided in Table 4.1-1. The 50-percent increase in cost is associated with pumping the influent to the WWTP near “Camp 24” and the effluent to Hunting Creek (36,900 linear feet of 15-inch force main and three additional pump stations) in Phase I.

Phase I of the collection system with influent and effluent force mains and pump stations is shown in Figure 4.1-1. Phases II, III, and IV of the collection system is presented in Figure 4.1-2.

Alternatively, pumping the treated effluent to Goose Creek is possible. WW Associates provided a preliminary construction cost of approximately \$1.8 million in the *Bedford County Public Service Authority Wastewater Collection, Conveyance and Treatment Preliminary Engineering Report*. A preliminary construction cost for discharging effluent to Goose Creek was not included in the scope of work for this addendum, but the costs appear comparable.

Preliminary WWTP construction costs did not change as a result of this study.

Section 5

Summary and Recommendations

5.1 General

Stearns & Wheler was retained by the Bedford County Public Service Authority to prepare an addendum to the Route 122/Moneta Sewage Collection and Treatment System Feasibility Study issued in September 2004. This addendum includes an evaluation of placing the proposed wastewater treatment plan on Bedford County's property (Parcel 233-A-40B) near "Camp 24" along State Route 654 and sewage collection system modifications necessary to convey raw wastewater to the site and discharge treated effluent to Hunting Creek.

5.2 Conclusions

Conclusions for collection system modifications and a wastewater treatment plant on Bedford County's "Camp 24" property (Parcel 233-A-40B) for the Route 122/Moneta service area include the following:

1. Construction of a WWTP on Bedford County's "Camp 24" property on Route 654 appears feasible and the property is of adequate size (76 acres±) to meet the needs of a proposed WWTP.
2. Buffer requirements (15 acres± total) for the facility limit site location on the property due to adjacent "Camp 24", VDOT, and BCPSA properties.
3. The Aznavorian property (Parcel 222-A-10F, 30± acre site) and Bedford County's "Camp 24" property (Parcel 233-A-40B, 76± acre site) are of adequate size for the placement of a proposed WWTP for the BCPSA.
4. A collection system consisting of gravity sewer, pump stations, and force mains is feasible for the Route 122/Moneta service area. The collection system can serve part of the service area by gravity with the remaining areas served by pump stations.

5. The Influent flow to the proposed WWTP, as situated on the “Camp 24” property, will consist of two pump stations in order to convey projected flows to the site.
6. The Effluent pump station will consist of a pump station and force main for conveying treated effluent from the proposed WWTP to Hunting Creek.
7. The construction cost of a collection system and a 0.5 mgd WWTP on Bedford County’s property near “Camp 24” is estimated to be approximately \$16.4 million and \$4.3 million respectively.
8. The construction cost of a collection system and a 0.5 mgd WWTP on the Aznavorian property is estimated to be approximately \$11.0 million and \$4.3 million respectively.

5.3 Recommendations

Recommendations for collection system modifications and a wastewater treatment plant on Bedford County’s “Camp 24” property (Parcel 233-A-40B) for the Route 122/Moneta service area include the following:

1. The BCPSA should consider both the Aznavorian property and Bedford County’s property as physically viable options for WWTP location to serve the Route 122/Moneta service area.
2. Based on the information obtained and presented in this report, the “Camp 24” site has a higher capital investment than the Aznavorian site, which may impact the WWTP location.
3. If the “Camp 24” site location is pursued further, additional research and analysis should be performed on WWTP location and infrastructure needed to convey wastewater to the plant.

The preliminary opinion of probable construction cost for Phase I of the collection system with a WWTP would range from \$3.9 to \$9.8 million dollars depending on which site is selected. Preliminary opinion of probable construction cost for a 0.5 mgd WWTP is \$4.3 million dollars with an overall cost ranging from \$8.2 to \$14.1 million dollars for Phase I of the Route 122/Moneta collection and treatment system.

5.4 Acknowledgements

Stearns & Wheeler would like to thank Rhonda English, Brian Key, and the staff of the BCPSA for their assistance in gathering and assembling data. Tom Hegarty was helpful with respect to providing vendor information for the influent and effluent pump stations considered.

APPENDICES

APPENDIX A: Preliminary Cost Estimates

Revised Cost Estimates for Aznovorian Site

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Route 122/Moneta Sewer Feasibility Addendum No 1	Computed By:	BSR
Location:	Bedford , VA	Checked By:	CMT
Owner:	Bedford County PSA	Design Status of Est.:	Preliminary
Description:	Collection System Summary	Project No:	40192

	Phase I	Phase II	Phase III	Phase IV	Total
Gravity Sewer Piping (PVC)	\$533,000	\$132,000	\$1,197,000	\$1,301,000	3,163,000
Pump Station	\$1,400,000	\$200,000	\$0	\$450,000	2,050,000
Force Main Piping	\$306,000	\$150,000	\$0	\$146,000	602,000
Force Main Appurtenances	\$9,000	\$5,000	\$0	\$4,000	18,000
Gravity Sewer Appurtenances	\$200,000	\$50,000	\$400,000	\$400,000	1,050,000
Crossings	\$90,000	\$12,000	\$60,000	\$238,000	400,000
Property Acquisition	\$50,000	\$0	\$0	\$0	50,000
Sub-Total	\$2,588,000	\$549,000	\$1,657,000	\$2,539,000	\$7,333,000
Contingency (30%)	\$776,000	\$165,000	\$497,000	\$762,000	\$2,200,000
Market Fluctuation (15%)	\$388,000	\$82,000	\$249,000	\$381,000	\$1,100,000
Mobilization (5%)	\$129,000	\$27,000	\$83,000	\$127,000	\$367,000
Total Construction Cost	\$3,881,000	\$823,000	\$2,486,000	\$3,809,000	\$11,000,000

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Rt. 122/Moneta Sewer Feasibility Addendum No 1			
Location:	Bedford , VA			
Owner:	Bedford County PSA			
Description:	Preliminary Cost Estimate			
Computed By:	BSR			
Checked By:	CMT			
Design Status of Est.:	Preliminary (Based on Peaking Factor of 2.5) for Phase I			
Project No:	40192			
Description: Estimate for Phase I	Quantity		Material/Equipment	
	No. Units	Basis	Per Unit	Total
<u>Costs for Phase I</u>				
<u>Gravity Sewer Piping (PVC)</u>				
8"	4100	LF	\$40.00	\$164,000
15"	3600	LF	\$50.00	\$180,000
18"	2800	LF	\$60.00	\$168,000
21"	300	LF	\$70.00	\$21,000
Sub-Total	10800			\$533,000
<u>Pump Stations</u>				
Lakes P.S.	2	LS	\$450,000.00	\$900,000
Influent P.S.	1	LS	\$500,000.00	\$500,000
Sub-Total	3			\$1,400,000
<u>Force Main Piping</u>				
8"	9100	LF	\$29.00	\$264,000
10"	1000	LF	\$42.00	\$42,000
Sub-Total	10100			\$306,000

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Rt. 122/Moneta Sewer Feasibility Addendum No 1			
Location:	Bedford , VA			
Owner:	Bedford County PSA			
Description:	Preliminary Cost Estimate			
Computed By:	BSR			
Checked By:	CMT			
Design Status of Est.:	Preliminary (Based on Peaking Factor of 2.5) for Phase I			
Project No:	40192			
Description: Estimate for Phase I	Quantity		Material/Equipment	
	No. Units	Basis	Per Unit	Total
<u>Costs for Phase I</u>				
<u>Force Main Appurtenances</u>				
Combination Air Release Vacuum Valves	7	EA	\$1,300.00	\$9,000
Sub-Total				\$9,000
<u>Gravity Sewer Appurtenances</u>				
4' Dia. Manholes	80	EA	\$2,500.00	\$200,000
Sub-Total				\$200,000
<u>Crossings</u>				
Roadways Crossings	4	EA	\$12,000.00	\$48,000
Stream Crossings	7	EA	\$6,000.00	\$42,000
Sub-Total				\$90,000
<u>Property Acquisition</u>				
Plant Footprint	5	ACRE	\$0.00	\$0
Plant Buffer	10	ACRE	\$5,000.00	\$50,000
Sub-Total				\$50,000
		Subtotal		\$2,588,000
		Contingency	30%	\$776,000
		Market Fluctuation	15%	<u>\$388,000</u>
		Total		\$3,752,000

***NOTES:**

Manholes are based on 1 manhole per 200 feet, then added 2 manholes per crossing and rounded to the nearest 10.

Roadway Crossings are based on \$200 per linear foot using an assumed length of 60 feet.

Stream Crossings are based on \$100 per linear foot using an assumed length of 30 feet.

Revised Cost Estimates for Camp 24 Site

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Route 122/Moneta Sewer Feasibility Addendum No 1	Computed By:	BSR
Location:	Bedford , VA	Checked By:	CMT
Owner:	Bedford County PSA	Design Status of Est.:	Preliminary
Description:	Collection System Summary	Project No:	40192

	Phase I	Phase II	Phase III	Phase IV	Total
Gravity Sewer Piping (PVC)	\$533,000	\$132,000	\$1,197,000	\$1,301,000	3,163,000
Pump Stations	\$3,300,000	\$0	\$0	\$450,000	3,750,000
Force Main Piping	\$2,335,500	\$0	\$0	\$146,000	2,481,500
Force Main Appurtenances	\$29,000	\$0	\$0	\$4,000	33,000
Gravity Sewer Appurtenances	\$200,000	\$50,000	\$400,000	\$400,000	1,050,000
Crossings	\$150,000	\$0	\$60,000	\$238,000	448,000
Property Acquisition	\$5,000	\$0	\$0	\$0	5,000
Sub-Total	\$6,553,000	\$182,000	\$1,657,000	\$2,539,000	\$10,931,000
Contingency (30%)	\$1,966,000	\$55,000	\$497,000	\$762,000	\$3,279,000
Market Fluctuation (15%)	\$983,000	\$27,000	\$249,000	\$381,000	\$1,640,000
Mobilization (5%)	\$328,000	\$9,000	\$83,000	\$127,000	\$547,000
Total Construction Cost	\$9,830,000	\$273,000	\$2,486,000	\$3,809,000	\$16,397,000

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Rt. 122/Moneta Sewer Feasibility Addendum No 1			
Location:	Bedford , VA			
Owner:	Bedford County PSA			
Description:	Preliminary Cost Estimate			
Computed By:	BSR			
Checked By:	CMT			
Design Status of Est.:	Preliminary (Based on Peaking Factor of 2.5) for Phase I			
Project No:	40192			
Description: Estimate for Phase I	Quantity		Material/Equipment	
	No. Units	Basis	Per Unit	Total
<u>Costs for Phase I</u>				
<u>Gravity Sewer Piping (PVC)</u>				
8"	4100	LF	\$40.00	\$164,000
15"	3600	LF	\$50.00	\$180,000
18"	2800	LF	\$60.00	\$168,000
21"	300	LF	\$70.00	\$21,000
Sub-Total	10800			\$533,000
<u>Pump Stations</u>				
Lakes P.S.	2	LS	\$450,000.00	\$900,000
Influent P.S.	2	LS	\$800,000.00	\$1,600,000
Effluent P.S.	1	LS	\$800,000.00	\$800,000
Sub-Total	5			\$3,300,000
<u>Force Main Piping</u>				
8"	9100	LF	\$29.00	\$264,000
10"	1000	LF	\$42.00	\$42,000
15"	36900	LF	\$55.00	\$2,029,500
Sub-Total	47000			\$2,335,500

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Rt. 122/Moneta Sewer Feasibility Addendum No 1			
Location:	Bedford , VA			
Owner:	Bedford County PSA			
Description:	Preliminary Cost Estimate			
Computed By:	BSR			
Checked By:	CMT			
Design Status of Est.:	Preliminary (Based on Peaking Factor of 2.5) for Phase I			
Project No:	40192			
Description: Estimate for Phase I	Quantity		Material/Equipment	
	No. Units	Basis	Per Unit	Total
Costs for Phase I				
<u>Force Main Appurtenances</u>				
Combination Air Release Vacuum Valves	22	EA	\$1,300.00	\$29,000
Sub-Total				\$29,000
<u>Gravity Sewer Appurtenances</u>				
4' Dia. Manholes	80	EA	\$2,500.00	\$200,000
Sub-Total				\$200,000
<u>Crossings</u>				
Roadways Crossings	7	EA	\$12,000.00	\$84,000
Stream Crossings	11	EA	\$6,000.00	\$66,000
Sub-Total				\$150,000
<u>Property Acquisition</u>				
Influent PS # 1	1	ACRE	\$0.00	\$0
Influent PS # 2	1	ACRE	\$5,000.00	\$5,000
Sub-Total				\$5,000
		Subtotal		\$6,552,500
		Contingency	30%	\$1,966,000
		Market Fluctuation	15%	<u>\$983,000</u>
		Total		\$9,502,000

***NOTES:**

Manholes are based on 1 manhole per 200 feet, then added 2 manholes per crossing and rounded to the nearest 10.

Roadway Crossings are based on \$200 per linear foot using an assumed length of 60 feet.

Stream Crossings are based on \$100 per linear foot using an assumed length of 30 feet.

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	Rt. 122/Moneta Sewer Feasibility Addendum No 1			
Location:	Bedford , VA			
Owner:	Bedford County PSA			
Description:	Preliminary Cost Estimate			
Computed By:	BSR			
Checked By:	CMT			
Design Status of Est.:	Preliminary (Based on Peaking Factor of 2.5) for Phase II			
Project No:	40192			
	Quantity		Material/Equipment	
Description: Estimate for Phase	No. Units	Basis	Per Unit	Total
<u>Costs for Phase II</u>				
<u>Gravity Sewer Piping (PVC)</u>				
8"	3300	LF	\$40.00	\$132,000
Sub-Total	3300			\$132,000
<u>Gravity Sewer Appurtenances</u>				
4' Dia. Manholes	20	EA	\$2,500.00	\$50,000
Sub-Total				\$50,000
		Subtotal		\$182,000
		Contingency	30%	\$55,000
		Market Fluctuation	15%	\$27,000
		Total		\$264,000

***NOTES:**

Manholes are based on 1 manhole per 200 feet, then added 2 manholes per crossing and rounded to the nearest 10.

Roadway Crossings are based on \$200 per linear foot using an assumed length of 60 feet.