

Summary
Final Supplemental Work Plan – Final Environmental Impact Statement (Second Issue)
For the
LOST RIVER SUBWATERSHED
of the
POTOMAC RIVER WATERSHED
Hardy County, West Virginia
West Virginia Second Congressional District

EIS Prepared by: Natural Resources Conservation Service (lead federal agency)

Project Sponsors: Potomac Valley Conservation District
Hardy County Commission
West Virginia State Conservation Committee

Proposed Action: Construction of multiple purpose Site 16 for flood control and water supply on Lower Cove Run and deletion of Site 23 on Cullers Run in the Lost River Watershed

Purpose and Need for Action:

- Project purposes: flood control, rural raw water supply, and watershed protection
- Watershed problems consist of flooding, loss of agricultural productivity, erosion and sediment damage, degraded water quality, threats to human health and safety as a result of flooding, impaired land use, and lack of dependable raw water supplies. Opportunities exist to reduce flooding, reduce erosion and sedimentation, improve human health and safety, ensure adequate and dependable raw water supplies, and enhance agricultural productivity as a result of the Lost River Subwatershed Project.

Description of the Recommended Alternative:

The recommended alternative is to construct Site 16 as a multiple-purpose flood control and water supply structure and to delete Site 23 from the Work Plan. The purpose for Site 16 has changed from flood control and recreation to flood control and water supply with incidental recreation.

Resource Information:

- 38°55'28" degrees North latitude and 78°49'41" degrees West longitude
- Hydrologic Unit Number 02070003
- Moderate Climate with few summer and winter extremes
- Lost River Watershed Size - 117,200 acres (183 square miles)
- Land Uses: 8% cropland, 16% grassland, 73% forestland, 3% miscellaneous
- Floodplain Land Use downstream of Site 16 (acres): 245 forestland, 75 miscellaneous, 396 grassland, 872 cropland
- Land Ownership: 75% private; 3% state-local; 22% federal
- Watershed Demographics
 - Hardy County Population (Census estimate July 2007) 13,661
 - Lost River Watershed Population (estimated) 2,804
 - 100% Rural Households, 99% White

- Hardy County Per Capita Income \$19,449; National Per Capita Income \$29,469
- Hardy County Unemployment Rate 5.3%; National Rate 7.1% (December 2007)
- Hardy County Poverty Rate 13.1%; National Rate 12.4%
- Median House Value (2000 Census) \$74,700
- Median Household Income (2000 Census) \$33,778
- Median age of population (2000 Census) 38.9
- Farm Information (2007 Census of Agriculture)
 - Number of Farms in Hardy County 514
 - Average Farm Size 261 acres
 - Market Value of Agricultural Products Sold (average per farm) \$287,994
- Archeological Sites Investigated as a result of Lost River Subwatershed Project Phase I – 43 sites; Phase II – 24 sites; Phase III – 2 sites
- Resource Concerns Relevant to Scoping: flood damages, erosion and sedimentation, agricultural productivity, water supply, recreation, water quality, endangered & threatened species, environmental justice, fish & wildlife coordination, cultural resources, invasive species, NED account, prime & unique farmland, public health & safety, riparian areas, waters of the US, wetlands
- Alternatives Considered
 - No Action Future Without Project Alternative
 - Alternative 1 – 3 as-built sites, land treatment, construction of multiple-purpose Site 16 for flood control and water supply, and deletion of Site 23
- About 16.02 acres of wetlands will be impacted by proposed Site 16 Project
- Mitigation Measures Proposed will be finalized during the 404 permitting process. Estimated costs for anticipated mitigation measures are included in Site 16 construction costs

Project Costs – Alternative 1 (3 as-built sites, land treatment, construction of Site 16, deletion of Site 23):

Construction	PL 534 Funds		Other Funds		Total	
	Dollars	Percent	Dollars	Percent	Dollars	Percent
Construction	42,371,200	92%	3,699,700	8%	46,070,900	100
Engineering	3,074,700	95%	151,700	5%	3,226,400	100
Relocation	348,800	82%	74,100	18%	422,900	100
Real Property Rights	4,674,400	48%	4,984,300	52%	9,658,700	100
Administration	867,200	85%	152,800	15%	1,020,000	100

Annual Project Benefits (Alternative 1): flood damage reduction benefits \$681,600; water quality improvement \$290,600; incidental recreation \$910,300; water supply \$1,166,800; other benefits as indicated in Tables 5 and 6

Net Annual Beneficial Effects (Alternative 1): \$541,400

Benefit Cost Ratio of Alternative 1, Supplement #4: 1.17

Period of Analysis: 100 years @ 4 5/8% project discount rate

Project Life: 100 years

Alternative 1 Benefit/Cost Ratio @ 1974 authorized project discount rate of 5 1/2%: 1.05

Environmental Impacts (Alternative 1): Potential environmental impacts include 16.02 acres of wetlands, 27.9 acres of prime farmland, 3,040 feet of linear feet perennial cold water stream, 6,080 linear feet of riparian habitat, and 222.5 acres of private land converted to public use. Environmental impacts to wetlands and wildlife habitat will be fully mitigated during the 404 permitting process.

Major Conclusions: Alternative 1, which includes construction of multiple-purpose Site 16 and deletion of Site 23, is the Recommended Alternative.

Areas of Controversy: Opposition by affected landowners at Site 16

Issues to be Resolved: All technical issues have been resolved.

Final Supplemental Work Plan No. 4
and
Final Environmental Impact Statement (Second Issue)
for the
Lost River Subwatershed
of the
Potomac River Watershed
Hardy County, West Virginia

INTRODUCTION

The Lost River Subwatershed Work Plan, for watershed protection and flood control, was approved for operations on February 11, 1975, under the authority of the Flood Control Act, Public Law 78-534. Sponsors of the project are Hardy County Commission, Potomac Valley Conservation District, and the West Virginia State Conservation Committee.

The Work Plan, prepared in October 1974, includes provisions for land treatment measures covering 94,750 acres, four single-purpose flood control dams, and one multiple-purpose flood control/recreation dam. A Final Environmental Impact Statement (FEIS) was issued in October 1974, covering the work to be installed as described above. For a description of project elements, alternatives, environmental resources, and projected impacts, the 1974 FEIS should be consulted. This document is available from the NRCS at the following address:

USDA – Natural Resources Conservation Service
West Virginia State Office
1550 Earl Core Road, Suite 200
Morgantown, West Virginia 26505

The 1974 Work Plan has been supplemented three times to add sponsors, change the land treatment program, and add rural water supply to one structure. Costs and benefits and project effects were updated in each supplement. Currently, land treatment measures have been applied

on 95,708 acres and three of the five originally planned dams; Site 4, Site 27, and Site 10; are complete.

Recent Document History – Supplement 4 Site 16

April 2005 – Request submitted to NRCS National Headquarters (NHQ) for Site 16 change of purpose.

May 2005 – NRCS NHQ granted change of purpose for Site 16.

June 2005 – Issuance of Site 23 feasibility report to local sponsors.

July 2005 – NRCS invitation to US Forest Service to be a Cooperating Agency for Site 16.

October 2005 – Interagency early planning meeting for Site 16.

April 2006 – Notice of Intent (NOI) published to announce preparation of a Supplemental Environmental Assessment (EA) for Site 16.

July 2006 – NOI to prepare a Supplemental EIS for Site 16 (rescinded April 2006 NOI).

August 2006 – Project environmental scoping meeting for Supplement 4, Site 16.

September 2006 – Notice of Availability (NOA) for First Draft EIS for Site 16.

September 2006 – Public Workshop for First DEIS.

May 2009 – NOA for Final Supplemental EIS (First Issue).

July 2007 – Federal Register publication of NOA for Record of Decision (ROD) for EIS.

February 2009 – Notice issued to announce withdrawal of July 2007 ROD.

April 2009 – NOA for Second DEIS for Site 16.

May 2009 – Public workshop for Second DEIS for Site 16.

August 2009 – NOA for Final Supplemental EIS (Second Issue).

PURPOSE AND NEED FOR PROPOSED ACTION

The 1974 Work Plan – FEIS and subsequent supplements contain a discussion of aspects of the watershed project, such as description of the watershed and watershed problems, that are not explicitly discussed in this report. These documents should be consulted for opportunities, goals, needs, and resource problems pertinent to the Lost River Watershed.

The proposed purposes of this project under PL-534 are:

- Watershed protection
- Flood prevention
- Rural water supply

The underlying need for the proposed action is tied to the recurrence of damaging floods in the watershed and the projected need for additional rural water supply through Year 2060 in the Lost River Subwatershed.

Background for the Purpose and Need

This supplement re-affirms the occurrence of damaging floods in the watershed and the continued need for flood control measures. Damaging floods have occurred in the watershed, on average, every 10 years. The floods of 1936, 1942, 1949, 1954, 1970, 1976, 1979 (loss of life on Bakers Run), 1985, 1996, and 2003 caused damage in the watershed. Approximately 1,900 acres of the watershed are floodplain, excluding the stream channel, extending from the headwaters of the watershed above Mathias to Wardensville and downstream to the contiguous Upper Cacapon River floodplain. Refer to the floodplain maps in Appendix B for more information. Damageable properties include homes, roads, bridges, commercial properties, farm

buildings, fencing, crops, pastureland, livestock, agricultural improvements, and public utilities. As part of this supplemental update, land use patterns in the floodplain and the type and number of damageable properties were verified and updated to reflect current conditions. Refer to the “Investigation and Analysis” section in Appendix C for more information on flood damage determinations.

Conditions Requiring a Supplement to the Project Plan

This supplement to the 1974 Work Plan (as previously supplemented) is required because of the sponsors’ request to change the purpose of Site 16 and to modify the extent of the overall project by eliminating Site 23. This supplement updates and reanalyzes the environmental impact statement, reassesses project feasibility, and documents changing conditions in the watershed. The objectives of this Supplement are to compile and evaluate economic and environmental data necessary for compliance under the National Environmental Policy Act, Clean Water Act, and other pertinent authorities and statutes; evaluate the impacts of deleting the recreational component at Site 16; evaluate the impacts of adding water supply to Site 16; evaluate the impacts of deleting Site 23; and reaffirm project feasibility. NRCS policies and procedures as outlined in the NRCS National Watershed Manual (NWM, 1992) were used in the preparation of this combined Final Supplemental Watershed Plan and Final Environmental Impact Statement (Second Issue).

Change in Purpose for Site 16:

Lost River Site 16, located in eastern Hardy County near the community of Lost City, was originally planned as a multiple-purpose recreation and flood control impoundment. However,

since the original Work Plan for Lost River was written in 1974, additional recreation facilities have been developed nearby at Lost River State Park, Trout Pond, Rock Cliff Lake, and Warden Lake. With the exception of meeting the demand for fishing, these facilities increased opportunities for outdoor recreation for the area and duplicated much of the facilities development that was planned at Site 16. As a result, the Sponsors requested the deletion of developed recreation as a project purpose at Site 16. Incidental recreation such as fishing, bird watching, boating, and hiking will still occur at Site 16.

However, just as changing conditions in the watershed caused the Sponsors to request the elimination of the developed recreational component, another critical need has been identified. During the re-evaluation of Site 16, the importance of water supply for Hardy County has been emphasized by the local sponsors. In 2004, the Hardy County Water Resources Study identified the need for additional water supplies in eastern Hardy County. In light of rapid development trends in housing and highway construction, Sponsors refined their projected water needs. Residential and commercial water supply needs were projected through Year 2060. Trends in housing growth, population growth, and highway development were used to predict the future water demand in the Lost River Valley and surrounding areas. Projections indicate that the water supply in Lost River Site 10 will meet about 75% of the estimated Year 2020 demand during the most critical drought periods. Sponsors recognize an immediate need to seek additional water supply sources. Additional water is needed from other sources to fully meet the projected 2040 need and to partially meet the needs through Year 2060. Appendix E contains the Sponsors' Water Supply Needs document. Therefore, the Sponsors requested that water supply be evaluated as a potential added purpose to Site 16.

Infrastructure development such as water supply is necessary to meet the needs of a growing population in eastern Hardy County. Public Law 78-534 allows for the addition of water supply in structures, provided there is justification for such a measure. In the case of Site 16, it is proposed that 400 acre-feet of the permanent pool be converted from a recreational pool to a water supply pool. Based on a safe yield analysis (extreme drought conditions), the storage in Site 16 and the storage in Site 10 will meet the projected water supply needs through approximately Year 2040. Water is essential for development at the Baker Industrial Park and the industrial park proposed for the Wardensville area. Construction of the Appalachian Corridor H highway, a new four lane route that traverses the watershed, is already spawning development and the need for plentiful, dependable water. Therefore, the Sponsors requested evaluation of the potential to add water supply as a purpose to Site 16.

Evaluation of Site 23:

The viability of Site 23, one of the two remaining structures planned as part of the original project, was assessed as part of this report. Site 23 was a planned single-purpose flood control structure located on Cullers Run 2.5 miles upstream of the confluence with Lost River. Additional engineering and geologic evaluations done in 1999 were reviewed for this report. Results of the geologic investigation did not show adequate on-site material for the construction of the impervious core needed for construction of an earth embankment. Off-site borrow material or alternative construction methods, such as roller-compacted concrete, were considered. Any of these methods would increase the cost of the site from the original planning cost (indexed to 2006 dollars) from \$4,414,200 to approximately \$32,000,000. Based on these engineering and geological concerns and the associated economic impacts, Site 23 has been

deleted from the Lost River Watershed Plan. The removal of Site 23 for the Work Plan has been considered in the overall project effectiveness.

SCOPE OF ENVIRONMENTAL IMPACT STATEMENT

This section documents the range of issues and impacts considered in developing this report, some of which were identified through the public and interagency scoping process. Tabulation 1 lists the environmental, economic, and social resource concerns identified during the project scoping as well as resource concerns that must be considered by NRCS. The degree of concern and relevance to the proposed action were determined through interagency consultation and through public participation during the development of this supplement.

**TABULATION 1
SUMMARY OF SCOPING
LOST RIVER SUBWATERSHED**

Resource Concern	Relevant to the Proposed Action?		Rationale
	Yes	No	
Sponsors, Public, Agencies			
Flood Damages	X		Flood damages a concern in watershed
Soil Erosion and Sedimentation	X		Sediment & erosion a concern in watershed
Agricultural Productivity	X		Area of high agricultural productivity
Water Supply	X		Identified as critical need by Sponsors
Recreation	X		Duplicate recreational resources identified; changed purpose as a result
Water Quality	X		Lost River TMDL
NRCS Requirements			
Air Quality		X	Project not in an air quality non-attainment area
Ecologically Critical Areas		X	None present in area of project impact
Endangered and Threatened Species	X		No federally listed species present (USFWS letter dated August 15, 2005 on file)
Environmental Justice	X		No disproportionally high or adverse effects anticipated to tribes or minorities.
Essential Fish Habitat		X	Lower Cove Run not designated essential fish habitat
Aquatic Resources	X		Convert cold water perennial stream to warm water lake
Land Use and Upland Habitat	X		Convert woodland, hayland and pasture to lake, dam and spillway
Floodplain Management		X	County zoning ordinance in effect; county participates in floodplain management program
Historic, Scientific, and Cultural Resources	X		Phase I and Phase II archeological testing completed. No adverse effects anticipated.
Invasive Species	X		Disturbed areas will be revegetated quickly to discourage spread of invasive plants
Migratory Birds		X	No long-term adverse effect on migratory bird populations
National Economic Development Account	X		Required by the Water Resource Council Principles & Guidelines
Natural Areas		X	No effect on designated natural areas
Parklands		X	None present in area of project impact
Prime Farmland	X		Prime farmland removed from agricultural production
Public Health & Safety	X		Potential for loss of life due to flooding
Regional Water Resource Plans/Coastal Zone Management Areas		X	Project is not in a regional water resource planning area or a coastal zone management area
Riparian Areas	X		Riparian habitat converted to lake, dam and spillway
Scenic Beauty		X	Scenic attributes of watershed not appreciably effected
Waters of the US	X		Perennial stream converted to dam, spillway and lake
Wetlands	X		Wetlands will be impacted by the installation of the project
Wild & Scenic Rivers		X	Wild & Scenic River Status does not apply

AFFECTED ENVIRONMENT

Population and housing growth, recreational amenities, and highway construction have increased the need for dependable water supplies in the watershed. There has also been growth in the agricultural poultry industry in the Lost River Valley. Other watershed conditions remain similar as described in the 1974 Work Plan – FEIS. The Lost River area has experienced an above average increase in population and housing growth over the past three to four decades. This increase corresponds to infrastructure improvements such as recreation amenities and highway construction. Such increases are associated with the continuous westward expansion and urban sprawl of the Washington, DC-Baltimore metropolis. Rural areas such as the Lost River Watershed are experiencing second home growth and development pressure, spurred in part, by the construction of the Appalachian Corridor H Highway. These changes have increased the need for a more dependable water supply than what has been relied on in the past. A dependable and sustainable water supply is necessary to support this growth. Thus, water supply is being proposed as a project purpose to Site 16 at the request of Project Sponsors. Since the completion of the 1974 Work Plan – FEIS, several recreational amenities have been added to the Lost River area, reducing the need to include similar developed facilities at Site 16. As a result, the Sponsors' request this project purpose be deleted. However, there will still be incidental recreation, largely in the form of fishing, available at Site 16.

Environmental resources that will be impacted at the proposed Site 16 location include 16.02 acres of wetlands, 27.9 acres of prime farmland, 3,040 linear feet of perennial cold water stream, and 6,080 linear feet of riparian habitat impacted. Additionally, 222.5 acres of private land will

be converted to public uses, directly impacting 17 parcels of land including the Forest Service parcel.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DETAILED STUDY

Several alternatives were considered in order to meet the purpose and need for this proposed federal action. The following discussion provides information regarding several alternatives that were considered but were ultimately eliminated from further study and comparison in this EIS, and the reasons for elimination.

Alternative Analysis for Flood Control:

An extensive alternatives analysis was done during the planning phase of the 1974 Lost River Subwatershed project. The 1974 Work Plan - FEIS contains a detailed description of the alternatives studied during formulation of the Lost River project as well as their expected impacts. These alternative measures include land treatment, flood proofing, flood insurance, floodplain purchase, stream channel modification, diking, impoundments, and various combinations thereof. An evaluation of alternatives to address flooding and water supply was conducted as part of Supplement #3 in March 2001 and again in this supplement with regard to their applicability and effectiveness given current watershed conditions. Additional alternatives such as stream bank restoration, riparian plantings, wetland restoration, restoration and preservation of floodplain areas, storm water and agricultural runoff management, dry dams, and property relocations were addressed based on comments received following the release of the first Draft Supplemental EIS issued September 2006.

Land Treatment Alone

Extensive land treatment has been applied as a component of the authorized Lost River Watershed project and has resulted in a reduction in sediment and erosion in the watershed. It has also improved agricultural productivity, improved soil moisture conditions, and prevented excessive loss of topsoil. However, as was the case in 1974, land treatment best management practices are ineffective in reducing flooding sufficiently to prevent damages during significant rainfall events in the Lost River watershed. Although land treatment practices meet the need for improved conservation of the watershed resources, they alone do not meet the need for flood control and water supply.

Floodproofing and Flood Insurance

As detailed in the 1974 Work Plan – FEIS and confirmed by re-evaluation during this planning effort, a combination of floodproofing and flood insurance is relatively ineffective in reducing flood damages to roads, bridges, most agricultural outbuildings, livestock, crops and fencing. These types of properties are not eligible for flood insurance and therefore, would not be covered under this alternative. Floodproofing typically involves elevating homes and businesses or building individual flood walls around damageable property. Such measures are not practical or cost-effective for farmland, roads, bridges, farm buildings, fences, and livestock. This alternative would be voluntary, reducing the likelihood that maximum benefits would be realized. This alternative does not meet the need for water supply. Given that this would not meet the underlying need, this alternative has been eliminated from further consideration.

Stream Channel Modification and Diking

Stream channel modification, diking, riprap, and bridge modifications were evaluated in 1974 as an alternative to reduce flooding. For the reasons cited in the 1974 Work Plan, including degraded habitat in about 15 miles of Lost River and increased peak flows and flood damages downstream, this alternative is no more applicable or feasible now than it was in 1974. This alternative does not provide sufficient flood protection to justify the costs and environmental impacts associated with this option. Flood damages to farming operations in the Lost River floodplains would still occur when flooding exceeds channel capacity, which is usually a 2-year frequency discharge (<http://www.epa.gov/warsss/sedsource/bankfull.htm>). This alternative is ineffective in reducing damages and is too environmentally damaging to implement. Also, it does not meet the need for water supply. Because this alternative would not be technically reasonable, it has been eliminated from further consideration.

System of Upstream Impoundments

Locations for as many as 30 upstream impoundments were evaluated for the original 1974 FEIS. These prospective impoundments were analyzed in different combinations and with other alternative measures as a means of providing a high level of flood damage reduction. This detailed analysis was conducted to determine the most effective combination of structures. The result was the recommended plan consisting of the five originally proposed Lost River impoundments. Three of these sites have been constructed.

As part of this supplemental evaluation, engineering, geology, and hydrology factors were re-considered to determine whether the remaining two impoundments from the original

Recommended Plan was still the most viable alternative. As discussed in the “Need for Supplement” section of this Second Draft EIS, Site 23 proposed for Cullers Run was re-evaluated, along with a second dam location, because of engineering and geology concerns. Neither of these Cullers Run sites were determined to be feasible and therefore Site 23 was eliminated from the Recommended Plan. The combination of Sites 4, 10, 16, and 27 was determined to be the best option for meeting the Sponsors’ objectives for flood control and water supply. No new locations for impoundments were identified as viable components of the Recommended Plan and so the evaluation of this alternative was eliminated from further consideration.

Floodplain Purchases and Relocation

Floodplain purchasing would require government acquisition of all the flood prone structures and farmland in the Lost River Valley. Acreage in the floodplain is approximately 1,900 acres. In order for this alternative to be effective at reducing damages, there would have to be 100 percent voluntary participation or the possible use of eminent domain on a large number of properties. Floodplain land would be returned to natural conditions and removed from agricultural production. Roads and bridges would be ineligible and would continue to incur damages. Removal of approximately 1,900 acres from private ownership, most likely through broad condemnation powers, would negatively impact the future tax base of the area and be socially disruptive. All farmland and income from such operations would be removed from the local economy (tax base). Relocation of agricultural operations to other prime flood-free agricultural land equivalent to the Lost River floodplain would be impossible in West Virginia. The social impacts of a non-voluntary floodplain purchase and relocation alternative exceed those of the

other alternatives. Furthermore, this alternative does not meet the need for water supply. Given this alternative would not meet the underlying need, it has been eliminated from further consideration.

Stream Bank Restoration

Stream bank restoration is a process that restores the vegetation, channel cross sectional area and/or the slope of an altered stream bank to more stable conditions. This is done to address excessive stream bank erosion, enhance aquatic habitat, improve riparian corridors and improve water quality. The flow capacity of a natural stream channel is generally a 2-year frequency discharge (<http://www.epa.gov/warsss/sedsource/bankfull.htm>). The vegetation along the stream bank creates resistance to flow, which results in lower water velocities, less soil erosion and potentially higher water surface elevations. While there are environmental benefits associated with this alternative, it would not appreciably reduce flooding in the watershed. This alternative does not meet the need for flood control or water supply. Given this alternative does not meet the underlying need, it has been eliminated from further consideration.

Riparian Planting

Riparian planting is a process that restores woody vegetation on an unstable stream bank to create more natural conditions. This is done to address stream bank erosion, enhance aquatic habitat, improve riparian corridors and improve water quality. The flow capacity of a natural stream channel is generally a 2-year frequency discharge. The vegetation along the stream bank creates resistance to flow, which results in lower water velocities, less soil erosion and potentially higher water surface elevations. While there are environmental benefits associated with this alternative, it would not appreciably reduce flooding in the watershed. This alternative

does not meet the need for flood control or water supply. Given this alternative does not meet the underlying need, it has been eliminated from further consideration.

Wetland Restoration

Wetland restoration is the rehabilitation of previously existing wetland functions, from a more impaired to a less impaired or unimpaired state of overall function. Wetlands are capable of improving water quality and reducing peak runoff, providing they are located upstream of damage areas and comprise a considerable portion of the drainage area in order to have an appreciable effect. Based on values presented in the EPA publication (<http://www.epa.gov/owow/wetlands/pdf/Flooding.pdf>), one acre of functional wetland has the capacity for three acre-feet of floodwater storage. At this rate, a minimum of 844 acres of wetlands would be required to replace the 2,531 acre-feet of 100-year frequency flood storage that Site 16 is expected to provide. There are not 844 acres of suitable wetlands available upstream of damage areas in the watershed, therefore it is not possible to achieve the same level of flood control with this alternative. Further, the construction of this amount of artificial wetlands would require more than 800 acres of level floodplain land. This land would be mostly farmland that would be removed from agricultural production. This alternative does not meet the need for flood control or water supply. Because this alternative would not be technically reasonable, it has been eliminated from further consideration.

Storm Water and Agriculture Runoff Management

Storm water management is used to address impervious surfaces such as roofs, roads, driveways, streets and parking lots that prevent storm water runoff from naturally soaking into the ground. It is usually applied in developing areas in order to keep post development volume and peak rate

of storm water discharges at the predevelopment values. The runoff control measures are typically designed for storms between 1-year and 25-year frequencies and do not provide flood protection for larger storms.

Agriculture runoff management can be used by farmers to reduce erosion, sedimentation, and chemical transport by applying management measures to fields and pastures. The volume and peak rate of storm water discharges are reduced by measures such as stream bank restoration, riparian buffer establishment, stream bank fencing, and conservation tillage. These actions are primarily used to address water quality and would not appreciably reduce the flooding in the watershed. This alternative does not meet the need for flood control or water supply. Because this alternative would not be technically reasonable, it has been eliminated from further consideration.

Dry Dams

A dry dam is a dam constructed for the purpose of flood control. Dry dams are designed to allow the stream to flow freely during normal conditions. Dry dams do not maintain a permanent pool of water. During periods of intense rainfall, the dam holds back the excess floodwater and releases it downstream at a controlled rate.

A dry dam does not differ significantly from a dam with a permanent pool. The primary difference between the two types of dams would be in the operation of the intake riser. The dry dam intake riser would have the lower gate normally open, while the dam with a permanent pool would have the intake riser lower gate normally closed. Construction costs are reasonably the

same for dry dams and conventional dams. Because the dry dam does not contain water supply storage, this alternative does not meet the need for water supply. Therefore, it has been eliminated from further consideration.

Alternative Analysis for Water Supply:

Several water supply alternatives were considered. Ground water and surface water sources were evaluated to determine their potential to meet the future water supply needs of the Lost River Subwatershed. *A Projected Water Needs in Hardy County* report is contained in Appendix E. *The Hardy County Water Resources Report*, (April 2004) may be found at the NRCS web site: http://www.wv.nrcs.usda.gov/programs/watershed/lost/lost_river.html. The executive summary from this report follows:

Executive Summary

This Water Resources Assessment was commissioned by the West Virginia Conservation Agency for the Hardy County Commission. The Natural Resources Conservation Service provided technical support and contractual services. The report provides information that will aid in planning and development of water resources in Hardy County as the county grows and expands. Of particular interest are the groundwater resources, springs, and the ability of municipal systems to meet current and future water demands.

Chapters 1 through 3 contain descriptive information about Hardy County. This information is based on the latest census reports and other appropriate references, supplemented by information from local planners.

There is detailed, analytical information in Chapter 4 regarding the springs, wells, and groundwater resources in the county. Because so many of the county residents are dependent on groundwater, and the poultry industry is completely dependent on wells, this portion of the report may be the most valuable to local planners. Future development of groundwater resources in the county should consider the limitations posed by the hydro-geologic character of the groundwater aquifers, which have low productive rates, although recharge to these aquifers is adequate across the county.

Wastewater and sewage collection systems are described in Chapter 5. Hardy County leaders have stressed the importance of developing information on community wastewater treatment systems than what was formerly available.

Public water supply systems are described in Chapters 6 and 7. Systems were located, described, and evaluated as to their current condition. The public water systems are also included in the GIS database. The Moorefield and Wardensville public water supply systems were evaluated for their

ability to meet demand through the Year 2020 with a 25 percent growth factor. The potential for using the Lost River Sites 4 and 10 for future water supply was evaluated and deemed feasible.

Costs for a water treatment plant in the Lost River Valley were evaluated in Chapter 8. This information will enable the Hardy County Commission to seek funding for such a facility.

A computerized geographic information system (GIS) file accompanies the report. The GIS shows the location and configuration of public water service, sewer service, and twenty five prominent natural springs developed specifically for the study, as well as a host of existing data on Hardy County.

Summary recommendations are included in the final chapter.

Groundwater

Two types of ground water sources, wells and springs, are heavily used to meet the present water demands in the area. Currently, wells and springs provide water to all the residents and businesses in the Lost River Subwatershed. Springs are common in Hardy County and are utilized as a water supply source for several localities. Wells are the sole source of water for the approximately 430 poultry house operations in the county, representing an intensive existing demand on the ground water resources.

These ground water sources are unreliable in the long-term due to restricted yields and would not meet future water quantity needs, particularly for any large scale industrial, commercial, or residential development. They are also subject to poor rates of recharge during periods of drought, as experienced most recently during the drought of 1999. As indicated in the Hardy County Water Resources Report, springs and wells do not have the potential to provide water in sufficient amounts to meet the long-term needs of the Lost River Subwatershed. These sources are especially vulnerable during drought conditions. During the 1999 drought, farmers used the Site 4 impoundment for emergency raw water supplies. Through the Emergency Conservation Program, producers drilled some new wells and acquired truck-mounted water tanks to haul

water from the impoundment to their operations. This drought event, and the impact it had on the local economy, reinforced the need to consider adding rural raw water supply to any future watershed projects. Due to the restricted yields and susceptibility to drought, groundwater has been eliminated from consideration as an alternative for water supply. Because this alternative would not be technically reasonable, it has been eliminated from further consideration.

Rivers and Streams

Rivers and streams were also evaluated as to their potential to meet water supply needs. Surface waters are subject to the same drought conditions as wells and springs, making streams and rivers susceptible to extreme low flow and no flow at times. Historical gage flow data (United States Geological Survey river gage at McCauley) show that the Lost River Subwatershed is at base flow during many of the late summer/early fall seasons. Base flow condition exists when the streams are totally recharged by groundwater. Under these conditions, placing an intake in Lost River for removal of any additional water from the stream system would be detrimental to the aquatic ecosystem. There are no water supply systems dependent on stream intakes in the Lost River Subwatershed due to the unreliable nature of this supply source. Because this alternative would not be technically reasonable, rivers and streams have been eliminated from further consideration as an alternative.

Water Purchase Agreements

Water purchase agreements were considered as another option to meet the water supply needs of the area. A water purchase agreement is an arrangement in which one community enters into an agreement to purchase water from another nearby municipality. The existing municipal water

supply systems in Hardy County serve approximately 39% of the county population, with the Hardy County Public Service District, Moorefield and Wardensville having the largest service areas. The largest potential customer base for expanded public water is in the Baker area.

Wardensville is the nearest municipal water system, but constraints such as a reliable water supply prevent that source from being considered as a reasonable alternative. Moorefield is nearly 22 miles to the west, in the South Branch River Subwatershed, and is too geographically distant to be practical. Therefore, water purchase agreements are not considered to be a reasonable alternative and have been eliminated from further consideration.

Water Conservation

In some situations, water conservation measures are a reasonable means of increasing the efficiency of an available water supply. Water conservation measures include reduction of excessive unaccounted for water (i.e., water lost in water systems due to leakage and unmetered use), and use of more efficient appliances and water conservation devices (e.g., low-flow toilets and showerheads, etc.). These measures typically apply to communities which are being serviced by older systems that are in need of upgrading. Because there are no existing systems in the Lost River Subwatershed, there are no options to implement systematic conservation measures. In reality, many rural households already practice water conservation because of the limited yield of their individual springs or wells. Thus, water conservation measures are not a reasonable option for meeting the future water supply needs of the Lost River Subwatershed and, therefore, water conservation has been eliminated from further consideration.

Impoundments

There are nine existing impoundments in Hardy County that provide flood control, recreation, and/or water supply benefits. Three of these are located in the Lost River Watershed – Site 27, Site 4 and Site 10. Site 10 is the only impoundment that is designed for flood control and water supply. The potential for Site 10 to meet all the water supply needs of the Lost River Watershed was evaluated. The other two sites, Site 27 and Site 4, were also evaluated as to their potential for expansion to include permanent water supply storage.

Site 10 was considered as an alternative to meet all the water supply needs of the entire Lost River Watershed. As per Supplement #3 to the 1974 Lost River Subwatershed Work Plan – FEIS, Site 10 was modified to include 400 acre-feet of dedicated water supply. Engineering information in the Supplemental Environmental Report for the Hardy County Public Service District (USDA, Rural Utilities Service 2004) suggested 360,000 gallons per day (gpd) as a “guaranteed” minimum output. This was determined by simply calculating the daily withdrawal of 360,000 gpd that 400 acre-feet of storage would supply for a year. The “guaranteed minimum” amount does not take into account inflow to the system or losses due to evaporation or seepage. The safe yield analysis for Site 10 indicates that the site will provide about 600,000 gallons per day during drought conditions (Gannett Fleming 2005-2006). This amount falls 200,000 gpd short of the projected water demand of 800,000 gpd by Year 2020 for the Lost River Subwatershed. This short fall requires that an additional source be identified. (For more information on water supply calculations refer to Appendix E).

Site 27 is located on Upper Cove Run, a tributary of Lost River. The dam site is located approximately 3.0 miles south of the community of Mathias. This is a single-purpose earth and rock fill impoundment built for flood control. The site has a drainage area of 3.75 square miles. Because of the small drainage area, this site is not suitable for incorporating water supply.

Site 4 is located on Kimsey Run, a tributary of Lost River. The dam site is located approximately one-half (0.5) mile west of the community of Lost River. This single-purpose flood control impoundment has a drainage area of 32.41 square miles. With this site's drainage area, it has potential for incorporating a dedicated and dependable water supply. Given this potential, the NRCS conducted an analysis of the costs and associated engineering requirements to add 400 acre-feet of water supply to Site 4. The investigation revealed that the elevation of top of dam, auxiliary spillway crest, and intake riser crest would have to be increased. These modifications would require the acquisition of at least 44 acres of land rights (property acquired in fee, flowage easements or a combination). The permanent pool would be raised approximately 5.5 feet in elevation. The existence of residences, buildings, roads and utilities within this area were not determined in this analysis. It is likely that Sponsors would have to use eminent domain to acquire additional landrights at Site 4. These landrights would need to be acquired from many of the same landowners that were impacted when Site 4 was built.

Construction modifications to Site 4 would require draining the lake for at least one construction season as the changes were made to the structure and appurtenances. There would be a loss of the established fishery for three to five years. The costs associated with modifications to Site 4

would be approximately \$9,500,000. This amount does not include road and utility relocations or additional landrights.

The modification of Site 4 would result in adverse environmental effects. These include raising the permanent pool over five feet in elevation and the temporary or permanent inundation of additional acreage. This modification would also eliminate an established public fishery for 3 to 5 years and require relocation of roads and utilities for a second time. Adverse social impacts will result from the potential use of eminent domain to acquire private property from landowners who were previously impacted by the original construction of Site 4. In addition, the cost of adding a water supply component to Site 4 exceeds the cost of including the water supply component at Site 16. The flood damage reduction benefits, incidental recreation, and other benefits afforded by Site 16 would not be achieved. For the reasons stated above, this alternative has been eliminated from further consideration.

SUMMARY AND COMPARISON OF ALTERNATIVES NOT ELIMINATED FROM FURTHER STUDY

Two alternatives are therefore evaluated and analyzed in this Final EIS: the No Action Future Without Project Alternative and Alternative 1 – construction of Site 16. A summary and comparison of these two alternatives, as well as the existing conditions in the watershed, for specific economic, environmental and social concerns identified during the scoping process is provided in Tabulation 2.

No Action Future Without Project Alternative

The No Action Future Without Project Alternative consists of no additional sites being built and no additional costs and benefits incurred. Several problems will continue without the flood control aspect of the proposed dam. People and livestock will remain at risk, while homes, buildings and crops will continue to suffer monetary damages from flood water. Transportation on Route 259 will continue to be disrupted during floods, which will result in economic losses through lost wages, inventory delays and road repairs. Chemicals and nutrients will continue to be washed from fields and pastures into streams during floods, resulting in water quality degradation.

The lack of a dependable water supply will result in increased demand on ground water, retarded development, and water shortages during droughts. Unregulated stream withdrawals could negatively impact plants, fish and wildlife throughout the watershed as the streams and river are used for emergency water supply during periods of drought. Well production rates are low (<50 gpm) due to the low porosity and hydraulic conductivity of the aquifers, which translates to higher investment and operating costs for the numerous wells that would be required to supply large volumes of water to consumers. The lack of a dependable water supply will also result in continued higher fire insurance premiums for homeowners and businesses due to an insufficient water supply for fire protection.

Alternative 1

Alternative 1 consists of construction of a multiple purpose impoundment, Site 16, on Lower Cove Run that will provide flood damage reduction and water supply. Site 16 will meet the Sponsors' needs for additional flood damage reduction for the Lost River Valley and will provide 400 acre-feet of rural water supply (safe yield analysis of 700,000 gpd) for the needs of current and future residents of the watershed (Refer to the Water Supply Report in Appendix E for more information on the projected needs and the safe yield analysis). Incidental to flood reduction and water supply, the development of Site 16 would provide opportunities for fishing and therefore contribute to meeting the demand for this type of recreation in the area.

TABULATION 2
SUMMARY AND COMPARISON OF ALTERNATIVES AND EXISTING CONDITIONS
LOST RIVER SUBWATERSHED

Effects	Existing Conditions As-built Sites 4, 10, 27; completed land treatment ^{1/}	Alternative 1 As-built Sites 4, 10, 27; completed land treatment; construction of Site 16; deletion of Site 23 ^{1/}	No Action (Future Without Project) Alternative
Project Investment ^{2/}	\$35,533,100	\$64,857,200	\$35,533,100
National Economic Development Account (Economic information is displayed as per the NWM, Standard Tables 1-6)			
Beneficial annual	\$2,660,000	\$3,638,200	\$2,660,000
Adverse annual	\$1,906,300	\$3,096,800	\$1,906,300
Net Beneficial annual	\$753,700	\$541,400	\$753,700
Flood Damage Reduction benefit	\$477,200	\$612,300	\$477,200
Water Quality benefits	\$228,000	\$290,600	\$228,000
Changes in Land Use	\$55,200	\$70,300	\$55,200
Incidental Recreation benefits	\$767,900	\$910,300	\$767,900
Secondary & Redevelopment benefits	\$406,700	\$518,600	\$406,700
Water Supply benefits	\$655,700	\$1,166,800	\$655,700
Land Treatment benefits	\$69,300	\$69,300	\$69,300
Environmental Quality Account (Alternative 1 information is displayed for Site 16 only)			
Concerns	Existing Conditions As-built Sites 4, 10, 27; completed land treatment	Alternative 1 (Site 16 Only)	No Action (Future Without Project) Alternative
Threatened & Endangered Species	No adverse effects identified	No federally listed species present	No federally listed species present
Wetlands	0.39 acres of wetlands adversely impacted. Adverse impacts minimized by creation of shallow water areas in upper end of pools.	16.02 acres of wetlands adversely impacted with construction of Site 16. More than 2 acres are within one foot of the pool elevation in the upper end.	No additional wetlands would be effected
Waters of the United States	Permanently eliminated 1.94 miles of perennial streams. 2.35 miles of stream subject to temporary inundation.	Site 16 will permanently eliminate 0.58 miles of perennial stream. 0.27 miles of stream subject to temporary inundation by Site 16.	No additional perennial stream length lost, converted or subject to increased temporary inundation.

Continued...

TABULATION 2
SUMMARY AND COMPARISON OF ALTERNATIVES AND EXISTING CONDITIONS
LOST RIVER SUBWATERSHED

Concerns	Existing Conditions As-built Sites 4, 10, 27; completed land treatment	Alternative 1 (Site 16 Only)	No Action (Future Without Project) Alternative
Aquatic Resources	Created 107.1 acres of permanent lake resources. Perennial streams lost, converted and inundated as described above.	Create 46.6 acres of permanent lake resources with Site 16. Perennial streams lost, converted and inundated as described above.	46.6 acres of permanent lake resources would not be created. Additional stream habitat not impacted
Recreation	Created 107.1 acres of flat water public fishing area. Create an estimated 40,217 person/days of fishing recreation annually.	Create 46.6 acres of flat water public fishing area. Create an estimated 7,456 person/days of fishing recreation annually at Site 16.	46.6 acres of flat water public fishing area and an estimated 7,456 annual person/days of fishing would not be created.
Riparian Areas	3.87 miles of riparian habitat along perennial streams were eliminated. 4.5 miles of lake shoreline were created.	An additional 1.15 miles of riparian habitat along perennial stream to be eliminated with Site 16. An additional 1.57 miles of lake shoreline to be created.	Additional 1.15 miles of riparian habitat along perennial stream would not be impacted. Additional 1.57 miles of lake shoreline would not be created.
Prime Farmland	35 acres of prime farmland taken out of production	27.9 acres of prime farmland taken out of production at Site 16.	Agricultural production on 27.9 acres of prime farmland would not be effected.
Water Quality	Temporarily increased erosion, sediment, turbidity, noise and air pollution during construction. Minimized adverse effects by applying BMPs. Lost River temperature increases minimized by installing cold water releases at Sites 4 and 10. Provide storage capacity for 890.4 acre/feet of sediment.	Temporarily increase erosion, sediment, turbidity, noise and air pollution during construction. Minimize adverse effects by applying BMPs. Lost River temperature increases minimized by installing cold water release at Site 16. Provide storage capacity for an additional 229 acre/feet of sediment at Site 16.	No temporary increase in erosion, sediment, turbidity, noise or air pollution would result from construction. No increase in temperature of Lost River would occur. No additional sediment storage capacity would be created.

Continued...

TABULATION 2
SUMMARY AND COMPARISON OF ALTERNATIVES AND EXISTING CONDITIONS
LOST RIVER SUBWATERSHED

Concerns	Existing Conditions As-built Sites 4, 10, 27; completed land treatment	Alternative 1 (Site 16 Only)	No Action (Future Without Project) Alternative
Land Use and Upland Habitat	416 acres of land utilized to develop 3 existing sites. 211.4 acres of woodland, hayland and pastureland permanently inundated and used for dam, spillway, and borrow. 186 acres of riparian and terrestrial habitats subjected to temporary inundation for floodwater detention.	234.4 acres required to develop Site 16. 86.6 acres of woodland, hayland and pastureland permanently inundated and used for dam, spillway, and borrow. 40.2 acres of riparian and terrestrial habitats subjected to temporary inundation for floodwater detention. 222.5 acres of private land converted to public use.	No additional private land will be converted to public uses. Agricultural and residential uses would remain on 222.5 acres of private land. No woodland, hayland, or pastureland would be altered.
Invasive Species	Invasive plant species already exist in watershed and at site	BMPs will be used to minimize spread of invasive plants	No effect on the invasive plant species already in watershed and at site
Historic and Cultural Resources	Phase I – 29 sites; Phase II – 21 sites; Phase III – 2 sites	Phase I – 14 sites; Phase II – 3	No additional investigations will be done
Other Social Effects Account			
Human health & safety	Improved with 3 structures built, flooding reduced – health & safety improved	Flooding further reduced with Site 16 – health & safety improved	No further improvement in human health and safety.
Dependable water supply	Improved with Site 10	Further improved with Site 16	No further improvement in water supply. Current situation expected to worsen with increasing demand.
Environmental Justice	No disproportionately high or adverse impacts to tribal or minority populations	No disproportionately high or adverse impacts to tribal or minority populations	No disproportionately high or adverse impacts to tribal or minority populations

Continued...

TABULATION 2
SUMMARY AND COMPARISON OF ALTERNATIVES AND EXISTING CONDITIONS
LOST RIVER SUBWATERSHED

Regional Economic Development Account (Economic information is displayed as per the NWM, Standard Tables 1-6)			
<i>Beneficial Effect Annualized (Benefits)</i>			
Measures	As-built Sites 4, 10, 27; completed land treatment	As-built Sites 4, 10, 27; completed land treatment; construction of Site 16; deletion of Site 23	No further action
Region	\$2,660,000	\$3,638,200	\$2,660,000
Rest of Nation	\$0	\$0	\$0
<i>Adverse Effect Annualized (Costs)</i>			
Region (non-federal costs)	\$242,100	\$419,100	\$242,100
Rest of Nation (federal costs)	\$1,195,100	\$2,374,300	\$1,195,100

^{1/} 2009 Price base. See Standard Tables 1-6 for more information.

^{2/} Economic Information is displayed for Lost River Watershed Project as per the NWM and consistent with Standard Tables 1-6

ENVIRONMENTAL CONSEQUENCES

This section describes the existing conditions and the effects of the two alternatives on the resources of concern identified in Tabulation 1.

Flood Damages

Existing Conditions

Flooding was the original impetus for the Lost River Subwatershed project and it remains a resource concern for Sponsors. Flood damages continue to adversely impact property and human health and safety. Three of the five planned flood prevention structures are completed, reducing but not eliminating the estimated annual flood damages experienced in the watershed. Refer to Table 5 for more information on flood damage reduction benefits. About 43 square miles of drainage area are controlled by Sites 4, 10, and 27 out of a total of 183 square miles of drainage in the Lost River Subwatershed.

Alternative 1

Alternative 1 will further reduce flooding in the subwatershed. The installation of Site 16 on Lower Cover Run, a tributary to Lost River, will reduce flood damages in the Lost River watershed and increase the amount of drainage area controlled by flood retarding structures in the subwatershed. The Lost River Subwatershed has a total drainage area of approximately 183 square miles. Drainage area is defined as the area draining into a stream at a given point. Currently Sites 4, 27, and 10 have drainage areas that total approximately 43 square miles. With the construction of Site 16, an additional 11.88 square miles of the Lost River Subwatershed will be located upstream of dam structures. The total drainage area, or areas located upstream of the four structures (Sites 4, 27, 10, and 16) that drain to the structures, would then total about 55 square miles. This increased amount of drainage area located upstream of the dam structures

will further reduce downstream flood damages in the Lost River subwatershed (Refer to Standard Tables 5 and 6 for flood damage reduction amounts). The drainage areas, located upstream of the structures, are considered controlled; because, the discharges from the drainage areas are impacted by the performance of the dam structures. The peak runoff from the drainage areas that flow to the dam structures are greater than the flow discharging from the dam structures, and thus are reduced. Therefore the amount of flooding downstream of the dams are reduced. Damage to homes, businesses, roads, bridges, and agricultural property will be reduced. There will be increased agricultural productivity and enhanced quality of life because flooding will be reduced.

No Action Future Without Project Alternative

There will be no further reduction in flooding without the installation of Site 16. Flooding at the current level will continue or slightly increase as the upland areas of the Lost River watershed are potentially developed, resulting in more impervious surfaces. Economic damages to agricultural properties, residences, and transportation corridors will continue at the present level. There will be no further improvement to human health and safety and quality of life as it relates to reduced threat of flooding.

Public Health and Safety

Existing Conditions

The installation of 3 flood prevention structures has improved public health and safety by reducing flooding in the watershed. Public health and safety is also improved by providing a dependable raw water supply.

Alternative 1

Alternative 1 will further improve human health and safety by providing additional flood damage reduction in the watershed. Dependable, long-term water supplies will be available at Site 16, coupled with the existing water supply at Site 10. There will be reduced risk to life and property with construction of Site 16.

No Action Future Without Project Alternative

Under this alternative, Site 16 would not be developed. There would be no further reduction in flooding and no further improvement in the health and safety of residents who may be at risk due to flooding. There would be no further reduction of flooding to transportation corridors in the watershed and no further improvement in human health and safety related to this concern. In addition, there would be no further health benefits to be gained from additional available water supply.

Water Supply

Existing Conditions

Water supply has become an important resource concern since the inception of the 1974 Lost River Subwatershed Plan – FEIS. The current demand for water supply is discussed in detail in the “Need for Supplement” section and in supporting documentation included in Appendix E. Supplement #3 to the 1974 Work Plan – FEIS also discussed the need for water supply. All the entities in the watershed - residents, farmers, businesses, Lost River State Park, and schools – currently rely on ground water or springs for water supply sources.

Rural raw water supply was added as a purpose to the Site 10 impoundment at Parker Hollow. Construction of this impoundment was completed in 2005. In addition to the 400 acre-feet of rural water supply at this impoundment, a water supply pipeline and associated appurtenances (intake structures and gate valves) was installed during site construction. The Hardy County Public Service District is seeking approval and funding for the construction of a water treatment plant and the initial phase of a water distribution system (near Baker); however, these facilities have not yet been constructed.

Alternative 1

In conjunction with the existing water supply available at Lost River Site 10, Alternative 1 will provide an additional 400 acre-feet of rural water supply (safe yield analysis of 700,000 gpd for Site 16) for the needs of current and future residents of the watershed (Refer to the Water Supply Report in Appendix E). Economic and agricultural activities will be enhanced with a more dependable water supply. Adequate infrastructure in the form of a dependable rural water system will allow better community planning and growth. An assured water supply will create the opportunity for industrial growth in the Lost River Subwatershed. Water sampling information indicates suitable water quality for a public water supply. Water test results are displayed in Appendix D.

No Action Future Without Project Alternative

Water supply demands will continue to increase in the future, even without the construction of Site 16. There will be increased pressure on groundwater resources as private wells are used for future development. There may be unregulated withdrawals from surface waters, especially

under drought conditions, reducing the surface water quantities to levels that could harm fish and wildlife. The detrimental effects of water shortages and droughts will continue without additional source water development to address future needs. In the long term, economic development will be hampered by lack of dependable water supplies. With the no action alternative, no additional rural water supply will be provided.

Soil Erosion and Sedimentation

Existing Conditions

As part of the original Lost River Subwatershed project, 95,708 acres of land treatment measures have been applied as part of the Lost River Subwatershed Project. These treatments have reduced erosion and sediment from upland areas of the watershed. However, sediment loads in the Lost River mainstem remain high and contribute to river instability. An aerial survey made in November 2004 (Cremann, et.al. 2005) documented 32,773 linear feet of severely eroding streambank along the main stem Lost River, as well as 6,801 linear feet impaired by bulldozer activity. Data developed for this study indicate that all of the bulldozer activity was located along the mainstem of Lost River south of Mathias and upstream of the existing and proposed Lost River impoundment locations. The areas of severely eroding streambanks were all identified on the mainstem Lost River north (downstream) of Mathias. This included 3,640 linear feet upstream of the mouth of Lower Cove Run (proposed Site 16) and 29,133 linear feet downstream of Lower Cove Run.

Alternative 1

Site 16 will trap sediment from the 11.88 square miles of drainage area upstream of the Site 16 structure. Additional sediment is already being captured from the respective drainage areas of Sites 4, 10 and 27. In total, all four structures capture sediment from the 55 square miles of drainage area controlled. Because most of the land cover above the proposed Lower Cove Run impoundment is forested, sedimentation from upland sources is believed to be minor. Eroding streambanks, particularly in the downstream portions of Lower Cove Run, appear to be the primary source of sediment. Sediment loads and turbidity downstream of the proposed embankment will be reduced by the installation of Site 16. In order to avoid or minimize the potential effects of discharging relatively sediment-free water from the impoundment, grade control will be installed below the outlet to dissipate energy and to prevent channel down-cutting in the lower reach of Lower Cove Run.

A reduction in sediment transported to Lost River from Lower Cove Run is not expected to result in any substantial affect to sediment loads presently existing in this river system. Pulses of sediment are delivered to Lost River from most of its tributaries during flood conditions. The containment of sediment within the Site 16 reservoir will only reduce the amount of sediment delivered to Lost River, not eliminate it. Stream stability in Lost River is not expected to be adversely affected by this sediment reduction.

A temporary increase in erosion and sedimentation may occur during construction of the project on Lower Cove Run. However, these adverse effects of construction will be minimized by the implementation of best management practices (BMPs) at the site.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed. Sediment originating from the 11.88 square mile upstream drainage of Lower Cove Run would not be contained. Excessive sediment from eroding streambanks in the downstream portion of Lower Cove Run would not be reduced and it would be transported to the Lost River main stem. There would also be no reduction in sediment deposition upon meadows and cropland, damage to crops, fertility losses and other impacts to farm productivity associated with unabated flooding. Aquatic habitat and water quality improvements from reduced turbidity and suspended sediment downstream of the proposed Lower Cove Run project would not be realized.

Agricultural Productivity

Existing Conditions

Agricultural productivity along the Lost River floodplain has been improved with the installation of 3 dams and the land treatment program. Reduced flooding on agricultural lands has improved crop yields by limiting the frequency of flooding and the degree of inundation. The three existing impoundments required 416 acres of private land to be converted to public uses, including 35 acres of prime farmland. Tables 5 and 6 show the monetary benefits associated with improved agricultural productivity.

Alternative 1

Alternative 1 will further enhance agricultural productivity by reducing erosion, sedimentation, and flooding in the watershed. The installation of Site 16 will further improve the productivity of hayland and cropland in the Lost River floodplain by reducing the magnitude and frequency

of flooding. With less flooding, repairs to fencing and other farming infrastructure will be required less often. Farm incomes will be further improved. Approximately 222.5 acres of private land will be converted to public uses, including 27.9 acres of prime farmland. There is no agricultural production on Forest Service lands impacted by the project so there are no effects with regard to this resource concern on Forest Service property.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed. Agricultural productivity would continue at current levels as there would be no additional reduction of flood elevations on the Lost River floodplain. The 222.5 acres of privately owned land along Lower Cove Run, including 27.9 acres of prime farmland, would remain in private ownership.

Prime and Unique Farmland

Existing Conditions

The effects upon prime and unique farmland resulting from the installation of the three existing structural sites were addressed in the supplemental reports prepared prior to the installation of those sites. No prime farmland soils were identified for areas utilized for Sites 10 and 27.

Thirty-five acres of prime farmland soils were identified within the area utilized for Site 4.

Alternative 1

The project area under consideration for Site 16 is comprised of 234.4 acres of land. About 222.5 acres of this land is in private ownership and about 11.9 acres are already in public ownership by the US Forest Service. Nearly all of the private portion of land in the project area

is utilized for agricultural uses. These uses include grassland production on hayland and pasture to support raising beef cattle and horses. Some of this acreage is used as cropland. Three residences (homesteads) are within the proposed project boundary.

Of the total 222.5 private acres, about 27.9 acres are classified as prime farmland (See Farmland Map, Appendix B). No soil mapping units have been officially designated as statewide important farmland or locally important farmland for Hardy County. None of the US Forest Service land in the proposed project area is classified as prime farmland.

Under this alternative, approximately 222.5 acres of private land would be placed in public ownership for the implementation of the Site 16 project. As a result, 27.9 acres of prime farmland would be removed from agricultural production due to the implementation of Site 16.

Flowage easements amounting to about 43.6 acres below the auxiliary spillway would be needed in the event water from the impoundment discharges through that outlet. Agricultural activities would not be restricted on this acreage with the exception that homes, barns, storage sheds or other like improvements would not be permitted within the flowage easement area. Refer to the Important Farmland map in Appendix B for more information.

No Action Future Without Project Alternative

Under this alternative, Site 16 would not be developed. The 222.5 acres of private land would remain in private ownership. About 27.9 acres of prime farmland would remain available for

agricultural uses. This alternative would also eliminate the need for approximately 43.6 acres of flowage easement below the auxiliary spillway.

Land Use and Upland Habitat

Existing Conditions

The effects of constructing Sites 4, 10, and 27 upon land use and upland wildlife habitats were evaluated in the supplemental reports generated prior to the installation of these projects. These three structural sites involved approximately 416 acres of land. Agricultural uses on these acres were eliminated. Upland wildlife habitat on the 107.1 acres permanently inundated was converted to aquatic and riparian habitats. This area included 23.3 acres of forestland, 64.5 acres of pastureland and 9.0 acres of cropland (hayland). An additional 104.3 acres were utilized for the construction of dams, auxiliary spillways and appurtenances associated with these sites. Approximately 64.7 acres of forestland, 32.6 acres of pasture, and 6.5 acres of cropland (hayland) were degraded or eliminated as upland wildlife habitat.

Supplemental plantings and the creation of brush piles adjacent to the dams, spillways and borrow areas were made to diversify habitats and reduce the adverse effects of the project construction. Other habitat strategies, including leaving trees and brushy areas in place and allowing hayland and pastureland areas to grow up, were implemented to minimize impacts. These habitat enhancements were selected in consultation with the WVDNR.

In addition to the 211.4 acres utilized for the dams, spillways and permanent pool areas for the three sites, about 186 additional acres were contained within the floodwater detention areas. Areas to be temporarily inundated by floodwater storage for Sites 10 and 27 included 20.4 acres

of pastureland, 13.5 acres of hayland and 14.4 acres of forestland. Land use for the 135 acres of flood storage pool for Site 4 was not specified. Upland habitat quality was not adversely affected on the flood storage pool areas subjected to temporary inundation.

Alternative 1

Note: The 231.5 acre project area for Site 16, as reported in the first Draft EIS (September 2006), was initially estimated from aerial photographs and Geographic Information Systems (GIS). Properties within the project area were surveyed during the spring of 2008. This survey revealed that the Site 16 project site contains a total of 234.4 acres. Because of the small difference between the estimated and measured acreage within the project area, the original acreages when broken down by land use categories, farmland and habitat types, as used throughout this second draft document, are based upon the original estimated total of 231.5 acres.

Land use and upland habitat for the proposed Site 16 project area is comprised of 81.0 acres of forestland, 107.4 acres of pastureland, 41.2 acres of hayland (cropland), and 1.8 acres of farmstead (See “Land Use – Cover Type” map, Appendix B). The 11.9 acre portion of the project area on US Forest Service lands is forested. Agricultural uses on the 222.5 acres of private land would be eliminated. Upland wildlife habitat on 46.6 acres will be permanently flooded and converted to aquatic and riparian habitats. This area is comprised of 19.3 acres of woodland, 13.9 acres of hayland (cropland) and 11.0 acres of pasture. The 2.4 acre (hayland, pastureland, and woodland) difference is a result of the overlap of permanent pool area and the footprint of the dam structure. An additional 40.2 acres will be utilized for the construction of

the dam and auxiliary spillway structures. This area is currently comprised of 9.3 acres of woodland, 23.2 acres of pastureland and 7.7 acres of hayland.

In addition to the areas to be utilized for the dam, spillway and permanent pool, an additional 40.2 acres will be periodically inundated by the floodwater retention pool. This area is comprised of 17.4 acres of woodland, 12.2 acres of hayland, 10.4 acres of pastureland and 1.6 acres of farmstead. The difference in acreages is a result of area overlap for the auxiliary spillway and the flood retention pool.

Areas to be utilized for the construction of the dam, auxiliary spillway and the associated borrow areas will permanently alter the existing upland habitats. The dam, spillway and borrow areas, not permanently inundated, will be revegetated with grass and legume seed mixtures.

Supplemental plantings of trees and shrubs, where they will not interfere with the function of these structures, will be made to diversify habitat. Forestland will be cleared within the permanently inundated area in order to minimize the collection of woody debris around the outlet structure of the dam. Tree stumps and vertical stems along Lower Cove Run upstream of the embankment will be left in place to provide cover for fish and other aquatic species. A selection of tree tops and other woody materials removed from the dam and permanent pool areas will be anchored in the upper end of the permanent pool for fish cover. Brush piles or windrows will be placed above the floodpool to provide cover for terrestrial species. Additional information regarding mitigation for adverse impacts to upland wildlife habitat can be found in the Mitigation Summary section provided in the Recommended Alternative section of this document.

Upland areas to be subjected to temporary inundation for floodwater retention will not be appreciably impacted by the temporary flooding. Woody vegetation in the flood storage pool areas that are not utilized for construction activities will be left in place. Flood storage pool areas, which are presently in grassland uses, will be allowed to evolve through natural vegetative succession or will be enhanced by artificial plantings of tree or shrub species. Habitat enhancements associated with the Site 16 project will be coordinated with the WVDNR and the USFWS.

Some tree removal is planned for the US Forest Service land that will be permanently inundated. The majority of the 11.9 acre Forest Service land in the floodwater retention pool will remain forested. Refer to the “Land Use – Cover Type” map in Appendix B for more information.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be developed. Land use and vegetative cover on the 234.4 acres identified for the project, including the 11.9 acres of Forest Service land, would not be altered and would remain in uses similar to those described under existing conditions.

Aquatic Resources

Existing Conditions

Aquatic resources were evaluated in the supplemental documents prepared prior to the implementation of the three existing sites. The three completed sites converted 10,220 linear feet of perennial stream, amounting to approximately 4.7 acres, to 107.1 acres of permanent lake

habitat. The stream resources originally supported populations of native non-game fish species. Kimsey Run (Site 4) also supported populations of smallmouth bass and rock bass. Trout were also stocked in Kimsey Run four times per year by the WVDNR to maintain a put and take trout fishery.

The 107.1 acres of permanent lake habitat are managed by WVDNR as warm-water largemouth bass and bluegill fisheries. The Kimsey Run (Site 4) impoundment is also stocked with crappie and channel catfish and receives trout stocking every two weeks from February through May. Site 10, at Parker Hollow, has received habitat enhancements designed to create an “exceptional channel catfish” fishery at that impoundment. Site 10 and Site 27 also have the potential to receive trout stockings in the future if fisherman demand exists and hatchery produced fish are available. Public access is permitted at each of these impoundments.

Aquatic invertebrates collected from the converted stream reaches prior to constructing the three impoundments included dragonfly, stonefly, mayfly, caddisfly, snail and crayfish species. Following the completion of these impoundments, there has been a shift from species dependant upon perennial stream habitats to those adapted to survival in lake environments.

Alternative 1

An evaluation of the fishery resources for Lower Cove Run was conducted on April 25, 2005, by the WVDNR (See Appendix D). A 100 meter (328 feet) segment of the stream, in the location of the proposed embankment, was sampled using triple pass backpack electrofishing methodology. Fish species collected included brook trout, central stoneroller, mottled sculpin,

greenside darter, fantail darter, blacknose dace and longnose dace. A total of 985 individual fish were collected during this survey. Only three individuals of the total sample were brook trout. The total estimated standing stock of the 100 meter reach sampled was 3.785 Kg (8.36 lbs). Brook trout comprised 0.004 Kg (0.009 lb) of the estimated standing stock. Portions of Lower Cove Run upstream of the project area are stocked with trout by the WVDNR. The stream receives one trout stocking per month from February through May. Fishing access is limited on the privately owned portion of the stream.

Lower Cove Run is listed as a “high quality stream” by the WV DNR and as a “B2 Trout Water” under Title 47 of the West Virginia Water Quality Standards. The small number of young-of-the-year brook trout collected during the April 2005 fish survey suggests that this species may have reproduced in Lower Cove Run. The discussion in the 2005 survey indicated that a fishery survey conducted on Lower Cove Run by the US Forest Service in 1965 resulted in no trout species being observed. Following this survey, 76 pounds of brook trout were released in March 1965 and in May of that same year 61 pounds of rainbow trout were stocked. The WVDNR conducted an electrofishing survey on Lower Cove Run on October 10, 1973, about one mile upstream from the mouth. No trout were observed during this survey; however, smallmouth bass and rockbass were collected. The presence of smallmouth bass and rockbass may suggest that water temperature (68 degrees F.), at the time of this survey, was higher than that usually inhabited by trout species (about 62 degrees F. or cooler). This assumption; however, can not be substantiated as WVDNR has occasionally found the bass and trout species both within a single survey. It is not known if the young-of-the-year brook trout observed in the 2005 survey

originated from a remnant native population, are offspring from the 1965 stocking or from stockings that were made by WVDNR on Forest Service lands in more recent years.

It is also not known if the brook trout population in Lower Cove Run is presently isolated from other potentially self-sustaining populations of brook trout that may inhabit other Lost River tributaries. The distance between these local populations may inhibit the movement of this species from one tributary to another. Low flows and elevated water temperatures during summer may also prevent individuals from moving between suitable habitats in the cooler upper reaches of tributary streams. Cooler temperatures and higher flows during winter may be conducive to brook trout movement in, out and between suitable tributary habitats. The construction of the proposed Site 16 impoundment would result in a barrier to fish movement between the upper reaches of Lower Cove Run and the lower sections of this stream and the main stem Lost River.

Rapid Bioassessment Protocol data were collected by the US Forest Service in April 2002 and March 1995 (Appendix D). Dominant aquatic invertebrates represented in the 2002 dataset include mayflies, fishflies, midges, stoneflies and caddisflies. Dominant invertebrates in the 1995 survey were mayflies and midges. The Macroinvertebrate Aggregated Index for Streams (MAIS) was 17 (very good) for the 1995 survey and 18 (very good) for the 2002 survey.

Under this alternative, about 3,040 linear feet of Lower Cove Run would be displaced by the dam and permanent impoundment. About 1.40 acres of perennial stream would be replaced with a 46.6 acre warm water impoundment. This portion of the stream will be permanently

inundated; however, the warm water impoundment will be conducive to the establishment of a bass and bluegill fishery with emphasis on creating an exceptional channel catfish waters. Habitat enhancements for channel catfish will be coordinated by WVDNR fishery biologists. It is possible that a seasonal spring trout stocking program will also be initiated if fisherman demand and availability of hatchery raised trout are adequate. The impoundment's fishery will be stocked and managed for public access by the WVDNR. It is estimated that 7,456 angler days of recreation will be provided annually once the fishery is established.

Aquatic invertebrate populations will shift from those adapted to cold water perennial stream habitats to those favoring warm water lentic habitats. Additional information regarding mitigation for adverse impacts to aquatic resources and fisheries can be found in the Mitigation Summary provided in the Recommended Alternative section of this document.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed. The 46.6 acre impoundment would not be created and there would not be an opportunity to create a warm water bass and bluegill fishery or to create an exceptional channel catfish fishery. About 1.40 acres of cold water perennial stream, comprised of about 3,040 linear feet, would not be converted to a permanent warm water impoundment. Native fish populations in Lower Cove Run, including the brook trout, would not be further isolated from the Lost River drainage as a result of the construction of the impoundment. Aquatic invertebrate species adapted to perennial cold water streams would remain as the dominant populations in Lower Cove Run.

Recreation

Existing Conditions

Several recreational facilities have been added in or near the Lost River Subwatershed since the 1974 Work Plan – FEIS was developed. The US Forest Service offers fishing, boating, swimming, camping, picnicking, and other activities at the Trout Pond Recreation Area in George Washington National Forest. Additionally, Lost River State Park has many amenities for residents and tourists, including a swimming pool, cabins, horseback riding, playgrounds, and camp sites. Also, recreational opportunities are available at Warden Lake. There continues to be a high demand for fishing in the area, as is evident by the fishing pressure at Lost River Sites 4 and 27. It is expected that there will be intensive use of the lake at Site 10 once the fishery there is established. WVDNR continues to invest in these fisheries in the form of fish stocking, fishery management and the maintenance of public access. Other than fishing, existing developed recreational facilities in or near the watershed appear to be sufficient to meet the recreational demand.

Alternative 1

Alternative 1 eliminates the developed recreational purpose originally associated with Site 16. Existing developed recreational facilities in or near the watershed duplicate many of those originally proposed for development at Site 16. Recreational features to be eliminated include a campground, picnic areas, picnic shelters, access roads and parking areas, playground, swimming beach, sanitary facilities and waste water treatment. Amenities associated with fishing, such as boat launching ramp (non-motorized or electric motors only) and parking, will remain a part of the Site 16 proposal. The elimination of the developed recreation components

will reduce the amount of Forest Service and private land required to implement these measures. Also, there will not be competition between the Forest Service, state and private recreational amenities and those initially proposed as part of the Lost River Subwatershed Project. It is estimated that 7,456 angular-days of fishing recreation will be provided annually once the Site 16 fishery is established. Visitation for other types of incidental recreation at Site 16, such as bird watching, hiking and boating, was not estimated. NRCS will work with project sponsors to develop an agreement pertaining to public access for recreational uses. This agreement is anticipated to be similar to the one created for Lost River Site 10 at Parker Hollow.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed. The 46.6 acre permanent impoundment would not be created and the opportunity for 7,456 annual angular-days of fishing recreation would not be realized. Limited fishing opportunities would remain on the existing perennial stream at the Lower Cove Run site.

Riparian Areas

Existing Conditions

Riparian habitat was described in the supplemental environmental documents prepared prior to the implementation of Sites 4, 10 and 27. Riparian areas affected by these sites were mostly forested with deciduous tree species. A total of 10,220 linear feet of perennial streams were converted to dam structures and permanent flat water impoundments. Riparian zones associated with these impacted streams were estimated to be 20,440 linear feet in length. These riparian areas were converted to 107.1 acres of flat water environment with a shoreline length of 23,750

feet. Shoreline vegetation was left intact where possible and was allowed to succeed through natural processes. Stock piled wetland topsoil was distributed in the shallow water areas of permanent pools to enhance the rapid re-establishment of wetland vegetative species.

Alternative 1

Riparian zones along both sides of Lower Cove Run are mostly forested. The forest cover is dominated by deciduous tree species with scattered conifers and eastern red cedar. The area in the upper portion of the stream in the project area is well shaded by the tree canopy and the streambanks sustain good cover comprised of tree roots, woody debris, boulders and large cobble and undercut banks. In the lower portion of the project area, Lower Cove Run riparian cover has a less dense canopy and an abundance of multiflora rose bushes in the vegetative understory. Streambank erosion is more prevalent in that area and sediment bars, comprised of large cobble and gravel, separate the normal stream channel and the floodplain. Cattle have access to the stream throughout the entire lower portion of the project area reach.

Under this alternative, about 3,040 linear feet of Lower Cove Run would be impacted by the construction of the dam, the permanent pool, and the principal spillway outlet. Approximately 6,080 linear feet of riparian habitat would be altered by Site 16 installation. All trees in the area of the dam site would be removed to facilitate construction. All trees upstream of the dam and auxiliary spillway, within the permanent pool of the impoundment, will be cut and removed from the permanent pool area. This clearing is necessary to eliminate trees and floating debris from collecting around the riser (outlet structure) and interfering with its function. In the area upstream of the embankment, stumps and the lower portion of vertical stems will be left in place for habitat enhancement. The severed portions of some trees will be strategically anchored in the

pool area for fish cover and others will be used for the construction of brush pile habitat on upland areas above the flood pool. The approximately 825 feet of Lower Cove Run between the principal spillway outlet and the lower project property boundary will have enhanced riparian vegetation because cattle will no longer have access to the stream and streambanks in that area.

Once the permanent pool of the impoundment is filled, about 6,840 feet of lake shoreline will be created. This area does not include the 1,450 feet of permanent pool shoreline across the upstream face of the dam. Forested areas above the permanent pool will not be removed except where necessary to facilitate construction or for the excavation of borrow material.

No Action Future Without Project Alternative

Under this alternative, no riparian habitat along 3,040 linear feet of Lower Cove Run would be altered as a result of the implementation of Site 16. No tree removal would occur to reduce the hazard of floating debris interfering with the operation of the principal spillway structure. Cattle would continue to have access to Lower Cove Run, and the riparian areas adjacent to it, on the privately owned land in the project area. Lake shoreline totaling approximately 8,290 feet, and riparian areas associated with the impoundment, would not be created. Existing conditions on the 11.9 acres of National Forest System lands would be maintained.

Wetlands

Existing conditions

The effects of implementing the three existing impoundments upon wetlands were addressed in the respective environmental documents for each site. Wetlands of 0.11 acres, 0.20 acres and

0.08 acres were delineated for Sites 4, 10 and 27, respectively. Wetland losses were offset by the shallow water areas created in the upstream ends of the permanent pools associated with each impoundment. Topsoil layers of impacted wetlands at Site 10 were salvaged and applied to shallow water areas in the permanent pool to enhance the establishment of wetland vegetation.

Alternative 1

The First Draft EIS released in 2006 estimated potential wetlands within the proposed Site 16 project area using hydric soils mapping units as an indicator. Approximately 29.55 acres of hydric soils mapping units were identified within the project area (See Appendix B – Soils Maps and Soils Descriptions).

Wetlands delineation on the 234.4 acre Lower Cove Run Site was completed in October 2007 (See Appendix D - Wetland Delineation Report). Wetland delineations were performed using the procedures and methodologies outlined in the U S Army Corps of Engineers Wetlands Delineation Manual – Technical Report Y-87-1 (January 1987). A total of 25.65 acres of wetlands were delineated within the proposed Site 16 project area. These wetlands were contained within eight areas and comprised three geomorphic settings, including: bottomland, abandoned stream meanders and hillside seeps (See Wetland Delineation map – Appendix B, and Tabulation 3).

**TABULATION 3. WETLAND AREAS DELINEATED.
REFER TO THE MAP ENTITLED “WETLAND DELINEATION”.**

GEOMORPHIC SETTING	WETLANDS	AREA DELINEATED (acres)	TOTAL (acres)
Bottomland	Area 1	24.53	24.53
Abandoned Stream Meanders	Area 2	0.20	0.93
	Area 3	0.04	
	Area 4	0.02	
	Area 5	0.01	
	Area 6	0.66	
Hillside Seeps	Area 7	0.17	0.43
	Area 8	0.26	
Artificial Wetlands (Ponds for Livestock water)	AW	0.22	---
TOTAL		25.87	25.65*

** Note that the total does not include the 0.22 acres of artificial wetlands (AW)*

The footprint (base) of the embankment will cover an area of about 16.97 acres. Of this area, approximately 2.17 acres of farmed jurisdictional wetland will be filled. An additional 0.5 acre of farmed jurisdictional wetland below the proposed embankment will be disturbed during construction. A new outlet channel, to be constructed between the impact basin below the dam and the existing Lower Cove Run channel will impact 0.01 acre of non-jurisdictional wetland. The total wetland area to be impacted by the embankment will be 2.68 acres.

A 46.6 acre permanent impoundment will be created upstream of the embankment. The permanent pool of this impoundment will inundate 12.68 acres of jurisdictional wetland (farmed) and 0.66 acres of non-jurisdictional wetland. The total wetland area inundated by the 46.6 acre permanent impoundment will be 13.34 acres.

A total of 16.02 acres of wetland will be impacted by the construction of the embankment and the creation of the 46.6 acre permanent impoundment. Of this total, 15.35 acres are jurisdictional wetlands and 0.67 acres are non-jurisdictional.

In addition, there are areas of wetlands that appear to exist in the area immediately below the proposed auxiliary spillway (43.6 acre flowage easement). These areas were not delineated as no construction is proposed for that area.

In the event that additional fill is required, additional wetland resources may be impacted (See ‘Project Map with Wetlands and Potential Borrow Areas’ in Appendix B). Any additional wetlands impacted will be added to the total indicated and the Compensatory Mitigation Plan (Proposed) will be amended as appropriate.

NOTE: *A Jurisdictional Determination (JD) field review was conducted on July 23, 2008 by COE (Pittsburgh district), USEPA and NRCS personnel. The JD report has not yet been received by permit applicants. References to jurisdictional and non-jurisdictional wetlands and waters are based upon conversations held in the field during the JD review. Drainage swales, ditches and other similar features (other than Lower Cove Run) were either included within delineated wetlands or were determined to be non-jurisdictional.*

A review of historical aerial photography of the Site 16 project area indicated that the site had:

1. Been in continuous agricultural land use (cropping, haying and grazing) since at least the 1930s and more likely since before 1900; and

2. The hydrology has been removed, diverted or otherwise altered via the use of bedding systems, culverts, diversions and drainage ditches.

Therefore, most areas described in the delineation report were evaluated using the “**Atypical Situation**” where “**Normal Circumstances**” did not exist.

The wetland areas delineated have had significant disturbance over a long period of time, have remained in agriculture production and have not been abandoned. Although these areas still exhibit the basic wetland parameters as described in the delineation document, the functionality of these areas is minimal at best. Due to the historical and current management practices, landuse, the alteration of natural hydrologic regimes, and the removal of vegetative communities, these wetland areas provide very little functionality in terms of wildlife value, water quality, flood storage or groundwater recharge. The restoration of any functionality to these wetlands would require the removal of fill, filling of ditches and cessation of current management.

It is estimated that about one acre of the upper, shallow end of the permanent impoundment will have a depth of one foot or less. An additional one acre, or slightly larger area, will be one foot or less above the permanent pool elevation in the upper end. The wetlands currently impacted by the previously installed surface drainage and the areas slightly higher than the permanent pool elevation will be enhanced by the higher water tables that will result from the impoundment. Additional enhancements, in the form of constructed wetlands and measures to improve the functionality of existing wetlands that will be avoided in the project activities, will be installed to mitigate wetland impacts that will result from the construction of the embankment and reservoir. WVDNR has credited the enhancement of existing wetlands for other projects at a mitigation

ratio of 5:1. Impacted wetlands with remnant wetland vegetation will have the topsoil layers removed and stockpiled. This topsoil and the associated plant matter and seed content will be distributed in shallow water areas of the impoundment and in constructed wetlands to facilitate the rapid re-establishment of wetland vegetation. Topsoil from impacted wetland areas exhibiting atypical vegetation will not be incorporated into constructed wetlands to minimize opportunities for the establishment of non-native wetland vegetative communities.

Unavoidable adverse impacts to the 16.02 acres of delineated wetlands will be mitigated on the project site by constructing wetlands and enhancing unaffected wetlands in the areas below the embankment and upstream of the 46.6 acre impoundment. According to West Virginia State Code, compensatory mitigation at a 2:1 ratio is required for palustrine emergent (PEM) wetlands and at a 3:1 ratio for palustrine scrub-shrub (PSS) wetlands. Mitigation for wetland impacts will be proposed to be implemented at a 1:1 ratio. A 1:1 ratio is proposed because of the poor functionality of the existing wetland conditions. In the event that wetland mitigation cannot be totally accomplished within the Site 16 project area, potential exists for implementing wetland mitigation measures on the Edwards Run Wildlife Management Area. This state owned area is located in Hampshire County about two miles north of Capon Bridge. It should be noted that constructed wetlands, whether constructed on site or at an off-site location, may take a number of years to achieve the desired level of functionality. The functionality will depend upon the time required for hydrophytic vegetation to become fully established within the wetland areas and the length of time necessary for wetland fauna to utilize the new habitat.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed and the delineated wetlands within the Lower Cove Run site would not be altered by the proposed project. Land use, consisting primarily of agricultural grassland production for cattle and horses, would likely continue. Land management practices, including the maintenance of surface drainage systems, would continue to reduce wetland hydrologic functions.

Waters of the US

Existing Conditions

The individual affects of the three existing impoundments, upon the waters of the US, were addressed in the respective environmental documents for each site. Cumulatively, the dam structures and reservoir pools permanently impacted 10,220 feet (1.94 miles) of perennial streams in the watershed. The impoundments at Sites 4, 10 and 27 total 107.1 acres of permanent pool area. Additionally, approximately 12,430 feet (2.35 miles) of perennial streams were subject to periodic inundation in the flood storage pools.

Alternative 1

Approximately 6,100 linear feet of Lower Cove Run lies within the proposed Site 16 project limits. Lower Cove Run is a perennial cold water stream that is 4.6 miles long and drains an area of 11.88 square miles. Lower Cove Run is 12 to 30 feet wide through the project area and has an average depth of 12 to 18 inches under normal flow conditions.

Under this alternative, approximately 3,040 linear feet (0.58 miles) of Lower Cove Run would be displaced by the dam structure and permanent impoundment. Of this total, 2,290 feet would be converted from perennial stream to a 46.6 acre permanent impoundment. About 570 linear feet

of the stream would be diverted through the dam structure's principal spillway conduit. An additional 180 feet of the stream below the dam would be replaced by an equal length of rock-lined outlet channel. Upstream of the permanent impoundment, about 1,425 feet of Lower Cove Run (between the permanent pool elevation and the auxiliary spillway crest elevation) would be subjected to periodic inundation by the 100-year flood storage pool. An additional 810 feet of the stream (between the auxiliary spillway crest and top of dam elevation) may be subject to infrequent inundation; however, this flooding is not expected to differ from the normal out-of-bank flooding resulting from high flows on this reach of the stream. About 825 feet of Lower Cove Run lies between the principal spillway outlet and the proposed downstream limits of the project.

Other drainage swales and ditches within the Lower Cove Run project area were either included within the delineated wetland areas or were determined to be non-jurisdictional waters.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed. Approximately 3,040 linear feet of Lower Cove Run would not be altered by the construction of the dam and 46.6 acre impoundment. An additional 1,425 linear feet of Lower Cove Run would not be subjected to temporary inundation as a result of floodwater detention.

Water Quality

Existing Conditions

The Lost River Watershed was added to the West Virginia 303(d) list of water quality impaired waterbodies for fecal coliform bacteria in 1996 (US EPA 1998). This listing was the result of fecal coliform bacteria levels exceeding the maximum allowable standard of 200 colonies per 100 milliliters for samples collected in the Lost River Watershed. Accordingly, Total Maximum Daily Loads (TMDLs) were developed in 1998 to establish allowable loadings to reduce pollution from both point and non-point sources in order to restore and maintain the quality of this water resource. The non-point source model developed in conjunction with this TMDL indicated that water quality standards will be achieved if fecal coliform loads are reduced by an average of 33.4 percent throughout the watershed. This average was comprised of reductions of 38.3 percent from pastureland, 12.8 percent from forestland and 37.8 percent from cropland.

Water quality data from the USGS gage station at McCauley (station number 01610200) was obtained from the internet site <http://nwis.waterdata.usgs.gov/nwis/gwdata>. Data for a variety of parameters exists for the period of record from January 1972 through August 1995. No records were posted for water quality after 1995. Since the existing Lost River dams were completed in 1996, 1998, and 2005, no water quality data from this station were available to show if the three impoundments affected water quality at the McCauley site.

Water quality testing was performed by the US Geological Survey from October 1988 to July 1989. These water samples were collected from the same tributary streams and the upper Lost River main stem as were the early 1970 samples (1974 FEIS). Average water quality values were listed in the 1990 Lost River Supplemental Information Report as: pH 6.7, dissolved oxygen 11.2 mg/l and hardness 37.1 mg/l.

In February 1994, water quality on Upper Cove Run was tested using field methods. These data revealed a pH of 7.1, temperature of 4.3 degrees Centigrade and dissolved oxygen of 13.1 mg/l. Camp Branch of Bakers Run was sampled on May 25, 2000, by NRCS personnel and analyzed by a commercial laboratory. Data for the Camp Branch laboratory analyses is contained in Appendix D.

The accelerated land treatment measures applied within the Lost River drainage have improved land cover and hydrologic conditions resulting in reduced runoff and erosion from treated areas. The conservation practices have helped limit water quality degradation by reducing nutrient and fecal coliform loading from agricultural sources within the watershed.

Alternative 1

Water quality data specific to Lower Cove Run were obtained from several sources. The US Forest Service provided water quality data collected in 1990, 1991, 1992, 1995 and 2002. The WV DEP provided water sample results collected in June 2000. Most recently, samples from Lower Cove Run above and below the proposed project site were collected January 2006 by the WV Department of Agriculture. The results of these analyses indicate good water quality in Lower Cove Run. The results of the water quality testing are contained in Appendix D.

The TMDL for fecal coliform in the Lost River (USEPA 1998) indicated that no study samples from Lower Cove Run exceeded the West Virginia water quality standards for these bacteria. The implementation of Site 16 would result in the removal of about 20 head of cattle and a limited number of horses from pastureland within the proposed project area. The removal of this

livestock from the fields adjacent to Lower Cove Run will have the potential to reduce coliform bacteria loading to Lost River as specified in the 1998 TMDL. Coliform bacteria from upland wildlife populations in the Lower Cove Run drainage area, including the National Forest System lands, are not expected to change.

The creation of the 46.6 acre permanent lake on Lower Cove Run would result in increased temperatures in the impounded lake water. The 1974 FEIS estimated that surface water temperatures may increase 5 to 10 degrees F. above the normal stream temperatures in late summer. The WVDNR collected temperature data at various elevations within the impoundments at Kimsey Run (Site 4) and Parker Hollow (Site 10) in August and September 2006 (See Appendix D). Cold water releases were installed at Kimsey Run and Parker Hollow at 11 feet (3.35 meters) and 16.5 feet (5 meters), respectively, below the normal water surface elevations of these impoundments. Temperatures at Kimsey Run were about 6 degrees C (10.4 degrees F) cooler in August and less than 1 degree C (1.2 degrees F) cooler in September when compared to surface water temperatures. Temperatures recorded at Parker Hollow were 9.8 degrees C (17.6 degrees F) and 7 degrees C (12.6 degrees F) cooler than surface temperatures for August and September, respectively. No temperatures upstream or downstream of the impoundments were measured.

To avoid adverse temperature impacts to the fishery downstream of Site 16, a cold water release in the principal spillway structure will be included with the riser configuration. Based on the WVDNR temperature data, the cold water release should have its crest approximately 4 meters (13 feet) below the proposed surface elevation of Site 16. This elevation would have the

potential of reducing temperatures of discharges from 5.3 degrees C (9.5 degrees F) and 11.5 degrees C (20 degrees F) below that of a surface-only discharge during late summer.

The accumulation of nutrients in the impoundment is not expected to pose a management problem. Forest litter, comprised of leaves and other vegetative matter, will provide the greatest source of organic material to the impoundment. Nutrient sources from agricultural activities or from human habitation in the Lower Cove Run watershed above the impoundment are negligible. Nutrient transport from the upper reaches of Lower Cove Run to the Lost River will be disrupted as a result of the construction of the impoundment. Nearly all of the coarse organic matter and much of the fine particulate organic matter and dissolved organic matter will be retained within the proposed impoundment. A minimal amount of the fine particulate and dissolved organic matter will be transported downstream of the impoundment through the principal spillway structure. Dissolved oxygen levels in the released water will approach saturation levels as a result of aeration through the principal spillway system. Dissolved oxygen (DO) data collected at the Kimsey Run and Parker Hollow impoundments in August and September 2006 (Appendix D) showed considerable decreases in DO concentrations between surface readings and those taken at a depth of 3 to 4 meters (10 to 13 feet). DO concentrations approached anoxic levels during August at both sites. During consultations with WVDNR, the fishery biologist indicated that anoxic water readily absorbs oxygen when given an opportunity to be aerated. Based upon this observation WVDNR expressed no concerns that water passing through the lower riser outlet would result in oxygen deficient discharges downstream. Similar results are expected at the Site 16 outlet. As a result of these consultations and the reference site data, it was

determined that no DO data needed to be collected upstream or downstream of the two impoundments studied.

No Action Future Without Project Alternative

Under this alternative, Site 16 would not be constructed and no water would be impounded on Lower Cove Run. Water temperatures and dissolved oxygen would not be altered and would remain as described in the existing conditions. Organic nutrients from vegetative matter would not accumulate as Lower Cove Run would not be impounded.

Threatened and Endangered Species

Existing Conditions

Consultations with the USFWS were made prior to completion of the 1974 Work Plan – FEIS and subsequent supplements. No threatened or endangered species are known or expected to be present in the watershed (Refer to USFWS letter in Appendix B). Therefore, no impacts to threatened or endangered species, or to habitats critical to their existence, were identified within the project areas.

Concerns for the endangered plant species Harperella (*Ptilimnium nodosum*), that exists along the Cacapon River more than 50 miles down stream of the Lost River Project, were discussed in the 1990 Supplemental Information Report. It was determined that no adverse effects to this plant species were expected due to the distance it is located down stream.

Alternative 1

In 2005 consultations with the USFWS were made regarding the proposed Lost River Site 16 project component on Lower Cove Run. The USFWS indicated by letter of August 15, 2005 (Appendix F) that “No federally listed endangered and threatened species are expected to be impacted by the project.” The addition of water supply as a purpose to Site 16 is not expected to impact listed species. No adverse impacts to endangered or threatened species were identified on National Forest System lands.

No Action Future Without Project Alternative

Under the no action alternative, Site 16 would not be constructed and there would be no adverse impact to any federally listed endangered or threatened species.

Invasive Species

Existing Conditions

Invasive species, especially invasive plant species, are of concern in all watersheds. According to the WVDNR website (www.wvdnr.gov/wildlife/invasivewv.shtm), 663 species of non-native invasive plants are found outside cultivation in West Virginia. A variety of invasive plant species already exist in the Lower Cove Run watershed; however, these have not been inventoried. Federal and state natural resource agencies have ongoing programs to monitor invasive species, but no specific information exists on conditions in the Lost River Subwatershed.

Alternative 1

Implementation of Alternative 1 and any additional land treatment measures will incorporate best management practices to reduce or minimize opportunities for invasive plant species to become further established. Construction areas and other sites with disturbed soils will be reseeded with desirable plant species as quickly as possible, reducing the opportunities for the spread of invasive plant species. Topsoil from impacted wetlands that have a preponderance of atypical or potentially invasive vegetative species will not be incorporated into mitigation wetlands or the shallow reservoir areas in order to minimize opportunities to spread undesirable species. Precautions will be taken to avoid the spread of noxious weeds in accordance with state and federal guidelines.

No Action Future Without Project Alternative

Under this alternative, Site 16 will not be constructed. Land disturbances associated with project implementation would not occur and opportunities for the introduction or dispersal of invasive plant species would be avoided. There will be no effect upon invasive species without further project action.

Historic, Scientific, and Cultural Resources

Existing Conditions

Cultural resource investigations were conducted during the planning stages for Sites 4, 10, and 27. A total of 29 prospective sites were identified during Phase I investigations at these sites. Twenty-one of these sites were studied further through Phase II investigations and two of these sites were investigated under Phase III protocols. Copies of cultural resources investigative documents pertaining to the three existing project sites were reviewed by the WVSHPO and

letters of concurrence with the findings were provided. Also, the 1974 Work Plan – FEIS and subsequent supplements contain detailed discussions of the findings and mitigation activities related to construction of Sites 4, 10, and 27.

Alternative 1

A cultural resources identification survey (Phase I) of the Site 16 project area was completed in July 2005. A total of eight prehistoric sites, five architectural sites, and 15 isolated finds were located. Consultation with the West Virginia State Historic Preservation Office (WV SHPO) indicated that five prehistoric sites warranted further testing or avoidance. It was determined that one of these five sites could be avoided; however, the other four could not.

After completion of the Phase I Archaeological Survey in 2005, the auxiliary spillway for the Site 16 impoundment was realigned to avoid potential impacts to the embankment that might result from flows through the auxiliary spillway. This realignment involved an area of about 49 acres that was not previously surveyed in the 2005 Archaeological report. In 2008, NRCS contracted to have Phase I investigations conducted on the 49 acres of land affected by the new auxiliary spillway and Phase II investigations on the four sites previously recommended for more detailed study. The second Phase I investigation revealed one new prospective prehistoric site and no new architectural sites. A number of isolated finds were recorded; however, most of these were adjacent to a site that had been found during the initial Phase I study. An additional Phase II site was determined to be outside of the area of potential effect and WVSHPO agreed to eliminate it from the list of sites recommended for Phase II analyses (See letter Appendix F).

Phase II work was completed in September 2008 on the remaining three prehistoric sites recommended for further study. Upon completing the three Phase II investigations, no additional archeological testing (Phase III) was recommended because the sites were not considered eligible for inclusion on the National Register of Historic Places or they were found to have limited research potential. Additionally, no further work was recommended for any of the isolated finds or architectural sites.

The Forest Service was provided copies of the Phase I report (July 2005) and the Phase I and Phase II report (September 2008). One of the prehistoric sites is on Forest Service land. Impacts to this site as a result of project installation will be avoided. Refer to the Investigation and Analysis section (Appendix C) of this report for more information. No additional cultural resources investigations are proposed to be conducted on Forest Service lands.

There are no cultural resources listed on the National Register of Historic Places in or adjacent to the Site 16 project area. Near the eastern portion of the proposed dam Site 16 the National Forest has surveyed sections of the forest. No recorded sites are listed near the project.

The WV SHPO has concurred with all the NRCS findings (See SHPO letter January 29, 2009, Appendix F). There are no federally recognized tribes in West Virginia, and as such, no government-to-government consultation was required. Furthermore, Hardy County is not claimed as an ancestral homeland to native tribes.

No Action Future Without Project Alternative

Without construction of Site 16, there will be no additional cultural resources investigations and no additional discoveries. None of the existing cultural resources on the site would be disturbed by Federal agency actions.

Environmental Justice

Existing Conditions

The Lost River Subwatershed is rural and predominately agricultural. There are no federally recognized tribes and there is a very low minority population in the watershed. Farming is the primary occupation although most families have supplemental off-farm income. The watershed population is 99% white.

Alternative 1

There are no disproportionately high adverse effects expected on environmental justice populations with implementation of Alternative 1 on any lands, including Forest Service lands. Public participation opportunities have been made available in the watershed, facilitating access to all interested persons. No tribes, minority groups or income classes will be impacted disproportionately via this action.

No Action Future Without Project Alternative

There is no disproportionate adverse effect on minorities, tribes, or income classes without the construction of Site 16.

Cumulative Impacts

This section evaluates the potential cumulative impacts of Alternative 1 and other identified past, present, and reasonably foreseeable projects on the environment. A description of the projects and an assessment of the potential cumulative effects on the environment are also detailed in this section.

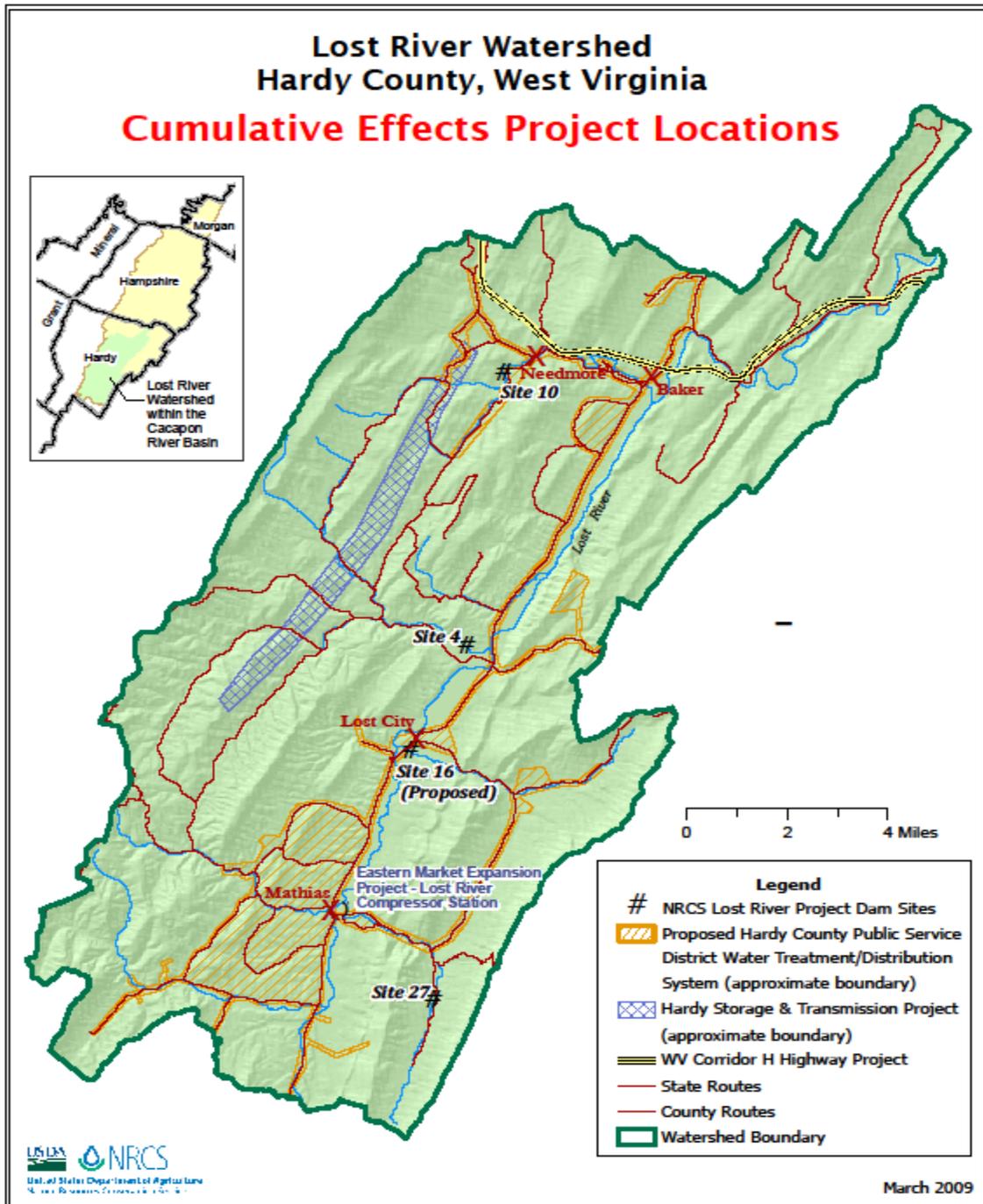
An interdisciplinary team has determined that the Cacapon Watershed, which contains the Lost River Subwatershed, is the appropriate geographic scale for evaluation. Information on these projects was obtained through a variety of methods, including agency consultation, published environmental documents, and public comments. Where quantification was not possible, an interdisciplinary team determined qualitatively through best professional judgment whether there could be a cumulative effect on an environmental resource. The known or anticipated environmental impacts resulting from these actions are described below.

Description of Identified Projects

In addition the Lost River Subwatershed Project, five other projects have been identified as having potential impacts to land and aquatic resources in the Cacapon Watershed. These projects include:

- The West Virginia Corridor H Highway Project;
- Hardy County Public Service District, Baker/Mathias Raw Water Treatment Plant and Water Distribution System;
- The Hardy Storage and Transmission Projects;
- The Eastern Market Expansion Project; and
- Continued residential and commercial development.

The relative locations of these projects, compared to the Lost River Subwatershed impoundments are shown on the following figure.



The **West Virginia Corridor H Highway Project** is comprised of a new 4-lane highway planned from west of Elkins, West Virginia to the Virginia State line east of Wardensville, West Virginia. The total highway project is proposed to be approximately 108 miles in length. The project was divided into ten construction segments that are either complete, under construction or still in design or planning stages.

The **Hardy County Public Service District, Baker/Mathias Water Treatment and Distribution System** is proposed to expand water service within Hardy County (See Hardy County PSD maps in Appendix B). A water treatment plant is proposed for construction below the existing flood retarding/water supply impoundment at Parker Hollow (Site 10). This 350 gallon per minute plant will utilize raw water from the Site 10 impoundment. Land for this treatment facility is currently in public ownership and is available for use by the Hardy County PSD. The treatment plant site was previously disturbed during the construction of Site 10.

A water transmission and distribution system is proposed for the Baker/Mathias areas of Hardy County that will serve an estimated 988 customers once all phases are complete. This system will ultimately consist of approximately 114 miles of water line ranging in size from six to 12 inches in diameter. The proposed system will include eight water booster stations and eight water storage tanks. The total estimated cost of this transmission/distribution system is about \$20,361,000.00.

Due to the estimated cost of these water system proposals, the Hardy County PSD project has been divided into five phases. Phase I includes the treatment plant at Parker Hollow and about

27.7 miles of water transmission/distribution lines to the Baker, Needmore and Arkansas areas, and along Route 259. This phase will provide water service to an estimated 293 customers. The Hardy County PSD has applied for funding and intends to initiate construction on Phase I as soon as funding prerequisites are achieved. To date, the PSD has not yet obtained the minimum number of commitments from prospective customers interested in connecting to this water system. Phase II will connect to the Phase I line about three miles north of Lost City and extend south to the Mathias area. Phase II is estimated to include about 19.5 miles of water lines and will serve about 225 additional customers. Funding for Phase II has not yet been secured. The cost of installing Phase I, including the Water Treatment Plant, and Phase II is estimated to be \$7,945,000 and \$3,205,000, respectively. Detailed information for additional phases is unavailable at this time.

The **Hardy Storage and Transmission Projects** include upgrades and expansion of the storage and transmission facilities associated with natural gas storage and transmission by the Hardy Storage Company, LLC, and a joint venture between Columbia Gas Transmission Corporation and Piedmont Natural Gas Company. This project will develop new storage facilities in a nearly depleted, self-contained geologic formation in the Oriskany sandstone that was used for natural gas production in the 1960s and 1970s. The project will make use of the Lost River field and the Inkerman field as the two main reservoirs. Twelve existing wells will be reconditioned for use in the storage fields and eleven new wells will be constructed for storage on previously undisturbed sites in Hardy County. Three new wells are proposed to be constructed on existing production well sites in Hampshire County. Pipelines connecting the storage wells and production wells adjacent to the storage fields are proposed.

Transmission pipelines are proposed to connect the storage fields to the Hardy Compressor Station to be upgraded near Mathias (see the Eastern Market Expansion Project discussion below). This compressor station would provide for injections and withdrawals of natural gas in the storage fields, as well as provide for additional compression for gas transmission.

The **Eastern Market Expansion Project** is proposed to improve the deliverability of natural gas from storage fields and to increase natural gas transportation capacity to distribution companies in the Mid-Atlantic region. The project consists of:

- Expanding existing storage fields in Ohio and Kanawha County, West Virginia;
- Increasing compressor capacity at four existing compressor stations in West Virginia; and
- Constructing three sections of 26- to 36-inch diameter pipeline loop in Virginia and Clay and Randolph Counties, West Virginia, totaling 15.5 miles.

The only portion of the Eastern Market Expansion Project that may affect the Lost River Subwatershed is the upgrade of the Lost River compressor station near Mathias, Hardy County. None of the pipeline loop construction or storage field improvements associated with this project are in the Lost River Subwatershed.

Continued Residential and Commercial Development is projected to occur in the watershed based on past trends. Residential development has traditionally occurred along the ridge tops of the watershed (see residential and commercial construction map, Appendix B). Commercial development is anticipated to occur at the Baker exit along Corridor H. Specific impacts to the

environmental resources cannot be quantified due to the random nature of private land development.

Environmental Effects

Each of the five projects is described below along with the known or potential environmental impacts resulting from these projects. Cumulative effects of all actions, including the implementation of various components of the Lost River Subwatershed project, are described in the Summary and Conclusions section for each resource of Concern.

The **Corridor H** highway will cross the Cacapon Watershed (including the Lost River subwatershed) in the vicinity of an interchange located at Baker, West Virginia. The highway segment west of Baker, toward Moorefield, has been completed. Approximately 9 miles of this segment lies within the Cacapon Watershed. The segment from Baker east to Wardensville was completed in the fall of 2006. The entire 6.7 miles of this highway segment lies within the Cacapon Watershed. The most eastern Corridor H segment is 6.5 miles long and runs from Wardensville to the Virginia state line. This segment lies entirely within the Cacapon watershed. Approximately 22.2 miles of the Corridor H highway will lie within the Cacapon Watershed.

The Corridor H highway will have converted about 1,784 acres of forestland and 673 acres of farmland, within the Cacapon Watershed, to highway uses when complete. Forest and farmland conversion was estimated to result in a net loss of about 1,602 wildlife habitat units within the Cacapon Watershed. An additional 949 wildlife habitat units were estimated to be lost from secondary impacts resulting from predicted development within the watershed. Impacts to

farmland by this highway in Hardy County included the removal from production of about 88 acres of Prime Farmland and 109 acres of Statewide Important Farmland. These amounts comprised 0.06 percent of the total farmland in Hardy County.

Nineteen wetlands comprising a total of 2.66 acres will be impacted by the corridor highway in the Cacapon watershed. These wetlands were estimated to be about 0.28 percent of the wetlands existing within the Cacapon watershed. Wetland types impacted include one forested wetland (0.24 acres), two scrub/shrub wetlands (0.14 acres), 11 emergent wetlands (1.63 acres) and five areas of open water (0.65 acres).

There is an estimated 96 miles of perennial streams in the Cacapon watershed. The Corridor H highway is expected to impact 9,650 feet of perennial streams as the result of installing pipes and box culverts. An additional 1,350 feet of perennial streams are expected to be relocated, to accommodate highway construction in the watershed.

The **Hardy County Public Service District, Baker/Mathias Water Treatment and Distribution System** is proposed for construction by the PSD as soon as prerequisites for funding can be achieved. The water treatment plant will be constructed on 2 to 2.5 acres of land below the Parker Hollow impoundment that is already in public ownership. The water transmission and distribution lines are planned to be installed along existing state and county road rights-of-ways. A small amount of land will need to be acquired in order to construct two water storage tanks and two booster pump stations. The water storage tanks are estimated to

require up to 0.25 acres each and the booster pump stations will require no more than 0.1 acres each.

Numerous stream crossings will be involved with the installation of the 47 miles of water transmission and distribution lines. Impacts to these streams will be minimal because stream crossings will be adjacent to roadway crossings. Erosion and sedimentation control measures will be followed and disturbed areas will be revegetated. This project appears to be located entirely within the Lost River watershed.

The **Hardy Storage and Transmission Projects** was scheduled for construction during the calendar years 2006 and 2007. The report estimated that 508.2 acres of land would be involved to install the compressor station, new pipelines, well sites and other facilities. Of this total, 152.9 acres would be used temporarily for construction and 355.3 acres would be used for permanent operation. Most of this project would involve sites, access roads and rights-of-ways already utilized for natural gas operations. The Environmental Assessment for this project (Federal Energy Regulatory Commission 2005) estimated that about 50 acres of forestland would be disturbed to install these facilities and 33 of these acres would be maintained for permanent operations. The report also estimated that about 28 acres of farmland would be disturbed during installation and 16 of these acres would be maintained for permanent operation. Restoration to prior uses was indicated for the 28 farmland acres. In addition, 4 acres of prime farmland would be utilized for the compressor station near Mathias. These acres would be removed from farmland uses. No other classified farmland impacts were identified.

The Environmental Assessment also indicated that approximately 72 wetland areas would be affected by natural gas facility installation. The effected area of these wetlands totaled 7.12 acres. Impacted wetlands were to be restored to original contours and revegetated with an approved wetland seed mixture. One hundred fifty two stream crossings were anticipated to be required to install pipelines. These include 54 perennial streams, 55 intermittent streams and 43 ephemeral channels. Best management practices in accordance with federal and state permit conditions were identified to minimize impacts to affected streams. No long term adverse impacts to fisheries were anticipated. Nearly all of this project will be within the Cacapon watershed.

The **Eastern Market Expansion Project** will only involve the Lost River watershed at the compressor station location near Mathias. Land resources involve about 6.9 acres that are within the existing Columbia Gas compressor facility.

Continued residential and commercial development may result in short term erosion and sedimentation, dust and noise during construction, increased impervious surfaces, locally increased runoff, changes in land use and to the vegetative community, and fragmentation of wildlife habitat. Development also produces increased demands on local public services and increased flood risk if development is within the floodplain. Demands upon the water supply also will increase, either through the installation of additional private wells, putting additional pressure on limited groundwater resources, or connections to the planned water distribution system. Due to the random and unpredictable nature of private development, there is no specific

quantified information available regarding impacts to specific environmental resources. The likely foreseeable impacts are described qualitatively rather than quantitatively.

Summary and Conclusions for Cumulative Impacts

The Cacapon River Watershed, inclusive of the Lost River Subwatershed, has a long history of activities that have altered the physical and biological composition in the region. Extensive timber harvesting in the late 1800s and early 1900s resulted in the removal of nearly all of the mature forests in the watershed. Streams were impacted by increased surface runoff following the removal of timber resulting in increased flood frequencies and magnitudes. Streambanks and channels exhibited increased levels of instability resulting in increased sediment transport, increased sediment and debris deposition and lateral stream channel migration. Landowners routinely modified stream channels to reduce flooding impacts, remove debris and to facilitate land utilization. Farming activities throughout the watershed were more intensive as family farms produced food and fiber for subsistence and marketing. Open agricultural lands were more prominent in the first half of the Twentieth Century than the current conditions that are dominated by forestland. The following tabulation is a summary of the areas of concern. More detailed discussion follows the tabulation.

Tabulation 4. Summary of Cumulative Impacts of the Lost River Subwatershed Project and Other Past, Present and Future Projects in the Cacapon River Watershed, West Virginia.

AFFECT	Lost River Site 16	Lost River Sites 4, 10 and 27	Corridor H Highway	Hardy PSD water treatment and Distribution	Hardy NG Storage and Transmission Project	Eastern Market NG Expansion Project	Total Resource Impacted <u>Total acres in Cacapon Watershed</u> (% of Total)
Project Land Requirements (acres)	234.4 ac	416 ac	2,457 ac	3.2 ac	508.2 ac	6.9 ac	3,626 acres <u>442,880 acres</u> (0.8%)
Forest land converted (acres)	28.6 ac	88 ac	1,784 ac	0.5 ac	50 ac	0	1,951 acres <u>363,162 acres</u> (0.5 %)
Farmland Converted (acres)	197.7 ac	146.5ac	673 ac	0	28 ac	0	1,045 acres <u>75,290 acres</u> (1.4 %)
Prime Farmland (acres)	27.9 ac	35 ac	88 ac	0	4 ac	0	155 acres <u>16,437 acres</u> (0.9 %)
Impacted Wetlands (number) ^{1/}	8	5	19	None specified	72	0	104
Impacted Wetlands (acres)	16.02	0.39 ac	2.66 ac	None specified	7.12 ac	0	26.2 acres <u>863 acres</u> (3.0%)
Habitat Units	97		2,551				2,648 HU <u>124,155 HU</u> (2.1%)
Perennial Streams							
Number Impacted (crossed)	1	3	21 (8 box culverts & 13 pipes)	Not specified	54	0	79
Length converted (feet)	2,785ft	10,220 ft	9,650 ft	0	0	0	22,655 feet <u>506,880 feet</u> (4.5 %)
Length disturbed (feet)	140 ft	900 ft	1,350 ft	Not Specified	2,700 ft	0	5090 feet <u>506,880 feet</u> (1.0 %)

^{1/} For all the above listed projects, wetland impacts are required to be mitigated resulting in no net loss of wetland acres.

Forestland

The Appalachian Corridor H FEIS (WVDOT and FHWA 1996) stated that there are 692 square miles (442,880 acres) in the Cacapon River Watershed. The projects described above, along with the three existing Lost River impoundments and the proposed Site 16 project, collectively require approximately 3,623 acres of land (Tabulation 4) in the watershed. This amount comprises about 0.8 percent of the land area in the watershed. The Corridor H FEIS also stated that 82 percent of the watershed was comprised of forestland (363,162 acres). Forestland required for the projects in Tabulation 3 was about 1,951 acres or approximately 0.5 percent of the forestland in the Cacapon Watershed. It is anticipated that some additional acreage will be converted from forest to residential or commercial use. Presently, it is difficult to quantify the extent of conversion to these uses, as they are privately controlled. In the context of total forestland in the watershed, the predicted impact from the proposed action combined with the other past, present, or reasonably foreseeable actions is not considered a significant cumulative impact on forestland.

Farmland

Farmland was estimated in the Corridor H FEIS to be 75,290 acres or 17 percent of the Cacapon Watershed. Soils classified as farmland in the Cacapon Watershed total 98,391 acres (USDA-NRCS SSURGO data). The difference is likely because not all of the prime and important farmland classified soils are utilized for farm land uses. Similarly, some farm land uses include soils that are not classified as prime or important farmland.

NRCS SSURGO data indicates there are 16,437 acres of prime farmland in the Cacapon Watershed. Tabulation 4 shows that the cumulative area of prime farmland converted for these

projects totals 155 acres. This number represents 0.9 percent of the prime farmland in the watershed. It is anticipated that some additional acreage will be converted from agricultural lands to residential or commercial use. Presently, it is difficult to quantify the extent of conversion to these uses, as they are privately controlled. In the context of total farmland in the Cacapon Watershed, the predicted impact from the proposed action combined with the other past, present, or reasonably foreseeable actions is not considered a significant cumulative impact on prime farmland, statewide important farmland, or locally important farmlands.

Habitat

Land use conversion will also impact wildlife habitat through direct changes to the vegetation community and vegetative structure, habitat fragmentation, loss of riparian areas along streams, and creation of open-water areas. The proposed action is estimated to result in a loss of 97 habitat units (HU) for terrestrial wildlife, or a 24 percent reduction of the existing habitat units on the 234.4 acre project site (see Mitigation Summary in Recommended Plan section of this document). The Corridor H project was estimated to result in a net loss of about 1,602 wildlife HU, and an additional 949 wildlife HU were estimated to be lost from secondary impacts resulting from predicted residential or commercial development within the watershed. It is recognized that many of the larger residential parcels would not be completely converted from their present land use type and would still provide some benefit to a variety of wildlife species. The total terrestrial habitat lost from these two projects and resulting development is estimated to be 2648 HU. However, the open-water in the new impoundment will result in the creation of an additional 30 HU for fish species.

Habitat impacts from the three existing Lost River impoundments have been minimal. Habitat losses resulting from the construction of the three embankments and auxiliary spillways were offset by mitigated habitat enhancements around the reservoirs and the creation of open water habitats.

Most areas within the Cacapon Watershed provide habitat for migratory birds. Land use changes will result in a loss of habitat for some types of migratory birds, such as common songbirds.

However, birds that utilize and feed upon open water, such as migratory waterfowl, bald eagles, and osprey, as well as those that depend upon shallow water habitats, such as shore and wading birds, will be benefited through the provision of additional habitat that is currently limited within the watershed. These benefits were not fully captured in the habitat evaluation procedures used (see Mitigation Summary in Recommended Alternative section of this document).

The Corridor H FEIS estimated that forestland and farmland in the Cacapon Watershed contained a total of 124,155 HU. Cumulative habitat losses of about 2,648 HU comprises no more than 2.1% of the habitat in the Cacapon Watershed. These habitat changes are not considered to be a significant adverse cumulative impact considering the large percentages of forest and agricultural lands that remain as terrestrial wildlife habitat within the watershed.

Wetlands

The Corridor H FEIS estimated that there are 862.7 acres of wetlands in the Cacapon River Watershed. Tabulation 4 estimates that 26.2 acres may be impacted collectively by the listed projects. This amount comprises approximately 3.0 percent of the known wetlands in the watershed. This number does not take into account that mitigation is required to offset impacts to wetlands that can not be avoided. This mitigation most often requires a number of acres of

wetlands to either be constructed or enhanced that equal or exceed the wetland acres adversely impacted. Wetland mitigation requirements result in no net loss of wetlands in the Cacapon Watershed as a result of these projects. Wetland impacts resulting from residential or commercial development in the past or foreseeable future have not been documented.

Disturbances to wetlands resulting from the activities described in this section are not considered to be a significant adverse cumulative impact to the total amount of wetland habitat within the watershed.

Perennial Streams

The total length of perennial streams in the Cacapon River Watershed is estimated to be 96 miles (506,880 linear feet) in the Corridor H FEIS report. Tabulation 4 estimates that about 22,655 linear feet of these streams were eliminated or enclosed within culverts or pipes. This amount, assuming that all of the impacted streams were perennial streams, amounts to 4.5 percent of the perennial streams within the watershed. An additional 5,090 linear feet (1.0 percent) of perennial streams in the watershed were disturbed, but not eliminated by these projects.

Disturbed streams included those altered or relocated by the construction projects and those where natural stream restoration measures were applied for mitigation. In the context of the total length of perennial streams in the Cacapon Watershed, the potential impact from the proposed action is not considered a significant cumulative impact on perennial streams.

This report has considered the cumulative impacts upon land and aquatic resources that have resulted, or is expected to result, from the implementation of major construction projects within the Cacapon River Watershed. The improvement of natural gas facilities and the construction of the Corridor H highway have benefits far and beyond the Cacapon and Lost River Watersheds. The two natural gas projects are intended to improve the availability of natural gas throughout

the entire eastern United States. Natural gas supplies may be improved locally as a benefit of these projects. The Corridor H Highway will ultimately connect Interstate 81 in Virginia with Interstate 79 in West Virginia. This east-west highway will improve transportation from the more densely populated areas of Virginia to points west including much of West Virginia. By improving transportation, the mountainous Eastern Panhandle area, including the Cacapon River Watershed (and Lost River Subwatershed) is expected to become more accessible and desirable for residential development. Commercial development as a result of the new highway is also anticipated.

Growth trends in Hardy County support the need for the Lost River Subwatershed project, including the proposed Site 16 impoundment on Lower Cove Run. New highway construction and population expansion from the east coast metropolis to the more rural Hardy County is already occurring, underscoring the need to plan and implement measures for watershed protection, flood protection and sustainable water supplies to meet future needs.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

There are no significant adverse environmental effects associated with the implementation of Alternative 1 that cannot be mitigated. Adverse social effects related to property acquisition for the effected landowners is acknowledged. Financial compensation will be provided to residents whose property is affected by project actions. Additional discussion on the impacts to property owners within the acquisition area for Site 16 can be found in the Recommended Alternative section of this document.

THE RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

In the short-term, there will be construction impacts associated with Alternative 1. Adverse impacts such as erosion and sedimentation will be minimized by the use of best management practices during construction. Minimal land disturbance and temporary mitigation measures will be implemented to reduce or replace short term losses. In the immediate area of the planned structures, long term land use will be changed from agricultural production to a lake environment. Long term productivity of downstream properties will be further enhanced by reduced flooding and increased and improved water supply.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Land obligated by Alternative 1 will be converted from private to public land. Presently, this land is in agricultural, forestry, and residential use. Approximately 0.4 acres of US Forest Service land will be permanently converted to impounded water by Alternative 1. An additional 11.5 acres of US Forest Service land will be periodically inundated. Labor and energy required for construction and maintenance of structural measures associated with Alternative 1 will be irretrievably committed. Federal funds for Alternative 1 will be expended.

POSSIBLE CONFLICTS WITH LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA

There are no known conflicts with any policies or plans in the watershed with respect to Alternative 1.

RISK AND UNCERTAINTY

Estimating project costs and benefits involves a certain degree of risk and uncertainty.

Assumptions made during the planning process are based on the best available technology and information at the time of planning. Extended delays between planning and implementation increase the degree of risk and uncertainty. Estimated project costs are based on computed work quantities multiplied by the appropriate unit cost for that type of work. Unit costs are based on historical data from similar projects, indexed to current price levels. Costs can be influenced by several economic factors that cannot be predicted with certainty during the planning process. Fuel shortages, unforeseen labor and materials shortages, natural disasters, and international incidents can adversely affect costs.

Economic benefits are based on material values of floodplain property and infrastructure. Such property is expected to become more valuable in the future as personal income increases. It is probable that some monetary and non-monetary benefits have not been fully captured. Finally, there is inherent uncertainty in estimating the social and environmental costs associated with Alternative 1 because values and judgment vary among interested parties.

Water supply projections are based on population and housing trend data and typical development patterns associated with new highway construction. Demands for water may exceed estimates if a major industrial or commercial water user locates in the watershed. Conversely, demands for water may decrease if development trends reverse. Additionally, a prolonged drought or unforeseen decline in the dependability of groundwater could drastically change the demand for a public water supply.

There are uncertainties with regard to any scientific modeling techniques applied to watershed analysis. Uncertainties are reduced by using standard procedures, trained specialists, and rigorous quality control procedures.

RATIONALE FOR RECOMMENDED ALTERNATIVE

Two alternatives are compared in detail in the context of this report: The No Action Future Without Project (NAFWP) Alternative and Alternative 1. Under the NAFWP Alternative, there would be no additional flood protection and no additional water supply provided. Needs for these resource concerns would not be met. The NAFWP Alternative is the National Economic Development (NED) Plan because it is the alternative with the greatest net benefits. However, the NED Plan does not meet the needs so it is not the recommended alternative. Alternative 1 provides the identified additional flood protection and water supply needs. Alternative 1 also provides non-monetary benefits in terms of improved human health and safety and reduced future stress on existing water supplies. These non-monetary benefits are not reflected in the NED calculations. Alternative 1 is the Recommended Alternative because it best meets the needs and is a viable alternative.

CONSULTATION AND PUBLIC PARTICIPATION

There have been opportunities for public participation at monthly conservation district meetings, WV State Conservation Committee quarterly meetings, and also at Hardy County Commission meetings. Consultations with other interested agencies and entities have also been conducted. An agency coordination meeting was conducted at the proposed site in October 2005.

Additionally, a widely-advertised public scoping meeting was held in the watershed in August 2006. State and federal agencies such as the US Forest Service, US Fish and Wildlife Service, WV Division of Natural Resources, and the State Historic Preservation Office have been consulted during the planning process.

A public scoping workshop was held on August 1, 2006 at East Hardy Middle School to provide interested individuals and agencies an opportunity to give input into the development of the EIS. There were 25 people in attendance at the workshop, including 11 from the implementing and cooperating agencies and local sponsoring organizations. One other governmental agency representative and 13 individuals with an interest in the project attended.

Comments were taken at the workshop and also after the workshop for a period of 15 days. Seventeen responses were received, including written comments and emails. Comments received regarding alternatives and environmental concerns are summarized in the following tabulation (Tabulation 5).

**TABULATION 5
SCOPING COMMENTS RELATIVE TO
ALTERNATIVES AND ENVIRONMENTAL CONCERNS
LOST RIVER SUBWATERSHED**

Issues	Number Comments
Consideration of a “no build” alternative	3
Consideration of water supply	8
Demographic assessments	3
Effectiveness of existing dams	7
Land treatment	2
Wetlands	7
Benefit cost analysis	8
Agency consultation	3
Archeology investigations	3
Borrow material sources	1
Recreation alternative	3
Consideration of dredging, channelization, buyouts, etc.	3
Social impact analysis	2
Consideration of moving Site 16 upstream	1
Sediment loads from Lower Cove Run	1
Updated costs for project	1
Wildlife habitat evaluation	3
Stream data	1

When applicable, issues raised at the public scoping meeting were incorporated into the Draft Supplemental Watershed Plan – First Draft EIS.

The First Draft EIS was distributed by mail on or about August 25, 2006 to agencies, stakeholder groups and individuals (see distribution list, Appendix G) for the purpose of soliciting comments. A postcard notification, announcing the availability of the First Draft EIS, was also sent to agencies, stakeholder groups, tribal representatives and individuals located beyond the immediate project area that may have an interest in the proposed project. Hard copies of the

report were available to those requesting copies and the First Draft EIS was posted electronically on the West Virginia NRCS website.

An informational workshop was held at the Baker Fire Hall on September 26, 2006 to provide interested individuals and agencies an opportunity to obtain information regarding the First Draft EIS for the proposed Site 16 project. Approximately 26 persons attended the workshop including 11 from the implementing and cooperating agencies and local sponsoring organizations. The remaining attendees were individuals with an interest in the project.

NRCS personnel from multiple disciplines were available at the workshop to entertain questions and discuss matters related to the First Draft EIS. Written comments were taken at the workshop and by mail or email. Comments were requested to be received at the NRCS State Office in Morgantown by October 25, 2006.

All of the comment letters, emails and other written comments received from agencies, stakeholder groups and individuals as a result of the review of the First Draft EIS are contained in Appendix G. This Appendix also contains the point by point disposition of the comments for which responses were prepared.

A Final Environmental Impact Statement for the Lost River Watershed Project was issued in May 2007. A Record of Decision (ROD) was issued in July 2007. In February 2009, NRCS made a decision to withdraw the ROD for this project. Notices were mailed to agencies, non-governmental organizations and individuals effected by or interested in the Lost River Watershed

Project. The intent of NRCS was to update information contained in the 2007 FEIS and re-issue this document as a second Draft Supplemental Environmental Impact Statement (second DSEIS). The second DSEIS was distributed April 2009 for review and comment by agencies, non-governmental organizations and interested individuals.

A public workshop was held May 14, 2009 at the Baker-Mathias Fire Hall at Mathias, WV to provide interested individuals and agencies an opportunity to obtain information regarding the Second Draft EIS for the proposed Site 16 project. Approximately 19 persons attended this workshop including seven from the implementing and sponsoring organizations. The remaining attendees were individuals with an interest in the project.

NRCS personnel from multiple disciplines were available at the workshop to entertain questions and discuss matters related to the Second DEIS. Written comments were taken at the workshop and mail or email. Comments were requested to be received at the NRCS State Office in Morgantown by May 27, 2009.

All of the comment letters, emails and other written comments received from agencies, stakeholder Groups and individuals as a result of the review of the Second DEIS are contained in Appendix A. A point by point discussion of comments and responses is contained in this section following the distribution list.

The distribution list for the Second Draft EIS follows:

**Distribution List for
Final EIS Lost River – Site 16
(Second Issue):**

Susan M. Pierce
Deputy SHPO
WV Dept of Education & Arts
Division of Culture and History
1900 Kanawha Blvd, East
Charleston, WV 25305-0300

Deborah Carter, Project Leader
US Fish & Wildlife Service
694 Beverly Pike
Elkins, WV 26241

Scott Hans, Chief Regulatory Branch
US Army Corps of Engineers
Pittsburgh District
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Lyle Bennett
WV Department of Environmental
Protection
Division of Water and Waste Management
601 57th Street
Charleston, WV 25304

Paul A. Mattox, Jr., Commissioner
WV Department of Transportation
Division of Highways
Building 5
1900 Kanawha Blvd, East
Charleston, WV 25305

Joe Manchin III, Governor
State of West Virginia
Bldg 5, Room 100
1900 Kanawha Blvd, East
Charleston, WV 25305-0700

Roger Anderson
WV Department of Commerce
Division of Natural Resources
PO Box 67
Elkins, WV 26241

Curtis Taylor, Chief
WV Department of Commerce
Division of Natural Resources
Wildlife Resources Section
Capitol Complex, Bldg 3, Room 812
1900 Kanawha Blvd, East
Charleston, WV 25305-0664

Truman Wolfe, Executive Director
WV Conservation Agency
1900 Kanawha Blvd, East
Charleston, WV 25305

William Hoffman, Chief
Environmental Programs
US EPA, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

David Rider
US Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Maureen Hyzer, Supervisor
George Washington & Jefferson National
Forests
5162 Valleypointe Parkway
Roanoke, VA 24019

James Smalls
George Washington & Jefferson National
Forests
Lee Ranger District
95 Railroad Avenue
Edinburg, VA 22824

Office of Federal Activities – A104
Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Michael Chezik
Regional Environmental Officer
U.S. Department of the Interior
Office of Environmental Policy &
Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, PA 19106-2904

Director
Office of Advocacy & Enterprise
South Building, Room 1345
Washington, DC 20250

Charlotte Hoover, Chairperson
Potomac Valley Conservation District
500 East Main Street
Romney, WV 26757-1836

County Commissioners of Hardy County
204 Washington Street, Room 111
Moorefield, WV 26836

D. Robert Taylor, Chairman
Hardy County Rural Development Authority
PO Box 209
Moorefield, WV 26836

Matthew G. Gapp, Chairman
Hardy County Public Service District
PO Box 209
Moorefield, WV 26836

Hardy County Public Library
102 North Street
Moorefield, WV 26836

Bryan Moore
Trout Unlimited
787 Twin Oaks Drive
Bridgeport, WV 26330

Patrick H. Webster
Joem C. Webster
824 Lower Cove Run Road
Mathias, WV 26812

Anthony Slater
Stephanie Slater
406 Gold Drive
Broadway, VA 22815

Elizabeth Webster
Anne Webster
294 Lower Cove Run Road
Mathias, WV 26812

Charles Foltz
Linda Foltz
1036 Lower Cove Run Road
Mathias, WV 26812

Mike Whetzel
Allaina Whetzel
PO Box 4
Lost City, WV 26810

The Walker Residence
2639 SR 259N
Wardensville, WV 26851

Alan Gramprrie
805 Lower Cove Run Road
Mathias, WV 26812

Jerry Dove
PO Box 24
Mathias, WV 26812

Todd E. Cianfrocca
1207 Oxbridge Drive
Lutz, FL 33549

Dale Kemper
Cheryl Edwards
7740 Sharewood Drive
Jessup, MD 20794

Mark Wolfe
189 Bear Run Road
Mathias, WV 26812

RESPONSES TO LOST RIVER COMMENTS – SECOND DRAFT EIS

Portions of the letters, emails and other written comments that require responses are reproduced here. Letters, emails and other written comments are contained in their entirety in Appendix A.

Comment letters and responses received following the release of the First Draft EIS are contained in Appendix G.

EPA Comment Letter on 2nd DEIS, May 27, 2009

Cover letter comments and/or suggestions:

Second paragraph, 5th sentence: “A short discussion of the recent document history could be added to the Second DEIS.”

Response: Comment noted. NRCS will add information on the EIS document history leading up to the Second DEIS. Second DEIS was issued to add additional information and detail.

Third paragraph (page 2); sixth sentence: “To date the dam (Site 10) has not been fitted for permanent water withdrawal, though the impoundment has been used for emergency withdrawal.”

Response: The following information pertaining to Site 10 will be added to the Final EIS. Specifically, a pipeline and associated appurtenances to allow for the withdrawal of water from the Site 10 reservoir for water supply usage was installed during the construction of Dam Site 10 at Parker Hollow. The Site 10 impoundment was completed in 2005. The Hardy County Public Service District is seeking approval/funding for the construction of the Water Treatment Plant and the initial phase of the water distribution system (near Baker); however, these facilities have not yet been constructed.

U. S. EPA Technical Comments:

1. **Overall, the Second DEIS does not go far presenting information on the current condition of the watershed; since portions of the project (three of the dams) have been in place for several years, evaluation of current water quality or flooding issues specific to Site 16 study area would be appropriate.**

Response: While the NRCS acknowledges EPA's comment, NRCS offers the following background on why the watershed level is the appropriate unit of analysis for a supplemental plan according to NRCS planning procedures. The Lost River Work Plan, as supplemented, describes water quality and flooding issues at the watershed level. This is the appropriate unit of analysis for this project since the unit of analysis for the resource concerns is the Lost River Watershed, not the Lower Cove Run watershed. The effects of all four sites are cumulative and result in improved water quality and reductions in peak downstream flood elevations along the main stem of Lost River.

The three existing dams in the Lost River Subwatershed are functioning as planned. Floodwater detention capabilities are operational and the 400 acre-feet of raw water supply is available for use. The impoundments are also being widely utilized for recreational activities. No post-construction water quality monitoring was stipulated as permit requirements for the three existing impoundments and, unfortunately, any changes in water quality can neither be documented nor quantified. Water quality documentation in Lost River was not raised as an issue by any agencies or individuals in attendance at the early agency planning meeting or the environmental scoping meeting. No water quality concerns have been raised by WVDNR or WVDEP since the installation of the three existing impoundments.

It remains of concern that the project is not analyzed independent of the combined effects of the other completed dams.

Response: See previous response. Tabulation 2 on pages 27-30 provides information regarding the Environmental Quality Account which shows the environmental effects for the three existing impoundments (existing conditions) and for Site 16 (Alternative 1). The cumulative totals for the environmental effects for the total Lost River Subwatershed Project may be determined by adding the two columns. This Tabulation also reflects the cumulative effects and cumulative benefits for the existing conditions (three completed impoundments), for Alternative 1 (three completed impoundments plus Site 16) and the No Action Alternative.

It should be noted that EPA did not attend the interagency planning meeting, the public project scoping meeting, or any of the public informational workshops held in conjunction with this proposed action. As a result, NRCS has only been able to respond to concerns raised by EPA after substantial analyses were completed through the first DEIS. Issues raised by EPA would have been preferably provided during the NRCS scoping meetings for the first DEIS when other federal and state agencies provided comments. The communication of concerns at this early date would help NRCS to identify all issues and resource concerns and to evaluate them in a manner satisfactory to EPA. Without early input, NRCS could only anticipate EPA's perspective on this proposed project.

Data that have been added to the appendices should be discussed in the text in more detail.

Response: Comment noted. References to appendices will be added to the text of the Final EIS document.

- 2. A dual purpose and need of the project presents a problem for NEPA analysis, particularly when part of the project is not intended to be completed in the foreseeable future. (As is evident with Dam 10, though the impoundment is “required” for water supply, it has yet not been fitted for supply withdrawal). It is difficult to assess environmental impact of a water supply system for Site 16 when it is not certain what will be proposed. It also leaves open the potential to request evaluation of separate projects addressing needs, to determine if other alternatives could address need with less environmental impact.**

Response: NRCS believes there is not a problem with a dual purpose and need for both flood control and water supply. Information developed by NRCS does demonstrate a need for water supply based on the best available information and analysis of water supply needs. It should be noted that the water treatment and distribution system proposed for the Lost River Valley by the Hardy County Public Service District is independent of the NRCS action and will be implemented regardless of any potential NRCS action on this project. If the water treatment and distribution system is never constructed, rural raw water supply will still exist at Site 10 *and Site 16* and the total of four impoundments will provide floodwater detention for the Lost River. The four impoundments will also provide incidental recreational benefits comprised largely of fishing.

To date, the Hardy County PSD has commissioned a preliminary design for the Lost River water system and the USDA – Rural Development has prepared an Environmental Assessment for the Lost River Valley water treatment and distribution system. Information from these documents were referenced in the Second DEIS and was discussed in the Cumulative Impacts section of the Site 16 document.

- 3. It would be helpful if the text of the DEIS gave specific reference and explanation to figures and tables or charts in the appendices. For example, there are 30 pages of “pre-project acres flooded/with project flooded/ with project profile” in Appendix B, but a discussion of the data is not given. Maps showing the proposed water distribution system in Appendix B should be called out in the body of the EIS, referenced and described especially in regard to potential aquatic, woodland or social impacts. Maps depicting recent development in the County, also in Appendix B, should be given a specific reference in the text and discussed.**

Response: Comment noted. References to Maps and Tables in the Appendices will be added to the text of the Final EIS document.

- 4. The document states that (page 31) about 43 square miles of drainage are controlled by Sites 4, 10 and 27 out of the 183 square miles of drainage in the Lost River Subwatershed. With construction of Site 16, an additional approximately 12 square miles of the Lost River Subwatershed will be located upstream of dam structures. The document discusses flood damages in terms of the watershed but does not refine damages specific to the area downstream of the proposed structure. This refinement would add substance to the purpose of presented in the EIS.**

Response: The purpose of flood damage reduction pertains to flood damages that occur along the Lost River Valley floodplain. The combined storage of flood water from each component impoundment will reduce the peak flood elevation in the Lost River main stem. Peak flood elevations will be reduced in the tributary streams below each component impoundment; however, these are not the primary areas targeted for the reduction in flood elevations. Flood elevations along Lower Cove Run below the proposed Site 16 dam will be reduced and will result in some monetary benefit. The greatest monetary benefits will be realized from flood damage reduction along the main stem of Lost River from the community of Lost River, through Baker and areas downstream. Flood damage reduction specific to the downstream reaches of Lower Cove Run is not the impetus for the installation of this impoundment.

As suggested for the earlier DEIS, it would be helpful to have a table to break down the flood event by year, number of structure suffering damage, value of losses (with references).

Response: Flood elevation models were used to estimate flood damages within the Lost River Subwatershed. The flood elevation models do not estimate flood damages from individual flood events. Flood damages are determined using flood elevation models based on historical rainfall records (verified from documented flood elevations from landowner interviews), land use patterns and surveyed valley cross sections. This information is used to determine the flood elevation for the design storm (100-year frequency) at various locations in the river valley. Property within the river valley that lies at or below the flood elevation is included within the area for which flood damages are calculated. This area includes homes, buildings, businesses, crop and hay fields, fences, roads, bridges and any other type of property that might be subject to flood damage.

These models are again run with parameters indicative of the system of four impoundments installed. Peak flood elevations with the impoundments installed are lower because of the flood water detention capabilities of the impoundments. The model captures the reduced discharges resulting from the installation of the impoundments and calculates the new flood elevations at various locations in the watershed. The difference in the amount of property flooded without the system of dams and the amount flooded with the four dams in place for the design storm is used to calculate the flood damage reduction.

Putting the historical flood events in a table and referencing these floods with the amount and value of property damaged is not relevant because this data is not utilized in the flood elevation model. Information from only the flood-of-record is used to calibrate the model with rainfall and the surveyed valley cross sections. Documentation of the amounts of damages attributed to

individual flood events is also not possible because not all flood damages are documented for each flood event. Damages paid by insurance companies to individuals, out-of-pocket expenditures paid by property owners, losses to crops, fences and livestock, lost time for work and the transportation of goods, and expenditures made by state and local governments to repair roads and infrastructure are not sufficiently documented to provide monetary damage estimates for each flood event.

The Second DEIS does not clearly present or evaluate the degree of flood protection the structure at Site 16 offers (there is a limited discussion in Appendix C). If this is stated in the 1974 Work Plan, then current data would be beneficial.

Response: The 1974 Work Plan described a system of flood control structures that would achieve a given level of flood damage reduction. This document continues the analysis of flood damage reduction based on the combined effect of a series of structures. The amount of flood damage reduction is calculated for the combined effect of all four of the impoundments in the Lost River Valley working together as a system.

The first portion of EPA's Comment 4 quotes the Second DEIS page 31 stating that the three existing sites (Dams 4, 10 and 27) control about 43 square miles of drainage (area upstream of the dams) and the installation of Site 16 will add about 12 additional square miles of drainage controlled. Each of the three existing impoundments and the proposed Site 16 impoundment will each have the capacity to store flood water from at least the 100-year frequency storm. Flood protection on the tributary streams below each dam will approach the 100-year level. This level of protection diminishes as these tributaries join with others that do not have flood retarding capabilities. Along the mainstem of Lost River, peak flood elevations will be reduced as a result of the combined storage of flood water by the four impoundments. Flood water from the 128 square miles of Lost River drainage not above these impoundments will discharge through the watershed unabated. The level of flood protection will vary depending on one's location within the watershed.

Information on what areas within the area of protection have specifically been affected by flooding in the last few decades since construction of the other dams in the watershed. Is there an estimate of the downstream affects of controlling water from the Lower Cove Run Subwatershed?

Response: Flood damages have been reduced in the watershed as a result of the partial construction of the Lost River Watershed Project. Table 5 of the document indicates the average annual flood damages before any structures were built (Pre-Project Benchmark Conditions) and with four flood control impoundments in place.

The downstream effects of controlling water from the Lower Cove Run Subwatershed are displayed in Appendix B. The Pre-Project discharges and peak flood elevations (Profiles) and the With Project discharges and elevations are shown for each Subwatershed, including Lower Cove Run.

- 5. Table 5 estimates average annual flood damage reduction benefits for the series of projects in the watershed (four structures). The methodology for deriving the table is not discussed and should be included in the document. It is unclear what savings apply specifically to Site 16.**

Response: This document is a combination of a Watershed Plan and an Environmental Impact Statement, thus it must meet the requirements of NEPA as well as the National Watershed Manual (NWM). The format of the report, including Tables 1 – 6, is defined in the NWM part 504 and an example is given in figure 504 – 16. Further, since this document is a supplement to the original watershed plan written in 1974, consistency between formats is important so that the public can compare the historic documents with the current Supplement. Additional guidance with regard to categories of benefits in Table 5 can be found in *Economic & Environmental Principals & Guidelines for Water & Related Land Resources Implementation Studies*, Section III and Section IV. The methodology for deriving each category of benefits in Table 5 is described in Appendix C of the Second DEIS. Additional information is also shown in Tabulation 2 regarding the additional benefits gained by the construction of Site 16. All information in Table 5 was developed in accordance with Principals & Guidelines and the NWM.

- 6. The document relies on the water supply needs presented in the Projected Water Needs in Hardy County, the same document from the earlier Draft and Final EIS (page 22 and Appendix E). It was evaluated and determined that the supply available at Site 10 (600,000 gallons per day, gpd, in drought conditions) alone will not meet the projected water demand of 800,000 gpd by Year 2020. The Hardy County document gives limited rationale for its estimate of demand, especially how the demand estimate factored in the expected growth of second homes, whose demand may be less than average home demand.**

Response: Future demand for water needs were estimated from historical water consumption rates, historical and projected population growth and historical and projected growth in the number of housing units within Hardy County. Where possible, information specific to the more local area including the Lost River Watershed were used to narrow the focus to this area of interest. This information is summarized in the reports *Hardy County Water Resources Assessment, April 2004* (posted on West Virginia NRCS website) and *Projected Water Needs in Hardy County, March 2007* contained in Appendix E of the Second DEIS.

Projections of population and housing growth were based upon U.S. Census Bureau data for Hardy County and the Lost River and the Cacapon Census Districts. Growth projections for population and housing were based on trend data for these variables from 1970 through 2000. Projected water demand in the Lost River Valley was based on projections for housing units in this area for the years 2020, 2040 and 2060. Housing unit growth was based on a projected increase of 30 percent per decade. This figure may be conservative as the actual increase in the number of housing units for the Lost River Watershed was 41 percent for the Census period 1990 to 2000. The use of housing unit growth for projecting future water demand, as opposed to using population growth, is appropriate as the growth rates for housing is higher nationally than

population growth. This is supported from census data indicating that the number of persons per household has decreased from 3.3 persons per household in 1970 to 2.59 persons per household in 2000. According to Gary Woodard, University of Arizona (Conservation Current Newsletter – Winter 2004-2005, New Mexico Water Conservation Alliance) “Only about half the demand for new housing over this period is due to rising population, with the other half due to the trend to smaller households.”

Water demand was based on the industry standard of 150 gallons per day per household unit. This standard is an average and does not distinguish between seasonal and full-time residential occupancy. This figure, and other water consumption rates for projected commercial developments, was from the Water Distribution Handbook (Mays 2000) and the State of West Virginia Design Standards (2000).

Permanent and seasonal/second homes require a stable water supply. While there are certainly cabins and small vacation cottages that are used as secondary homes, there are also many large, investment property homes in the Lost River Watershed. These homes have modern appliances, irrigated lawns, additional bathrooms, and other amenities that increase water use. The industry standard of 150 gallons per day per household is an average, taking into account all sizes and occupancy characteristics of houses.

- 7. The report dismisses the use of wells, by stating that existing wells suffer supply challenges in times of drought, but provide no information on well depth, whether deeper wells have been developed and with what success.**

Response: This DEIS relies on the extensive analysis that was conducted in the Hardy County Water Resources Report regarding the suitability of wells. The following text is the executive summary for that document. For the complete report, please refer to the NRCS website.

Executive Summary

This Water Resources Assessment was commissioned by the West Virginia Conservation Agency for the Hardy County Commission. The Natural Resources Conservation Service provided technical support and contractual services. The report provides information that will aid in planning and development of water resources in Hardy County as the county grows and expands. Of particular interest are the groundwater resources, springs, and the ability of municipal systems to meet current and future water demands.

Chapters 1 through 3 contain descriptive information about Hardy County. This information is based on the latest census reports and other appropriate references, supplemented by information from local planners.

There is detailed, analytical information in Chapter 4 regarding the springs, wells, and groundwater resources in the county. Because so many of the county residents are dependent on groundwater, and the poultry industry is completely dependent on wells, this portion of the report may be the most valuable to local planners. Future development of groundwater resources in the county should consider the limitations posed by the hydro-geologic character of the groundwater aquifers, which have low productive rates, although recharge to these aquifers is adequate across the county.

Wastewater and sewage collection systems are described in Chapter 5. Hardy County leaders have stressed the importance of developing information on community wastewater treatment systems than what was formerly available.

Public water supply systems are described in Chapters 6 and 7. Systems were located, described, and evaluated as to their current condition. The public water systems are also included in the GIS database. The Moorefield and Wardensville public water supply systems were evaluated for their ability to meet demand through the Year 2020 with a 25 percent growth factor. The potential for using the Lost River Sites 4 and 10 for future water supply was evaluated and deemed feasible.

Costs for a water treatment plant in the Lost River Valley were evaluated in Chapter 8. This information will enable the Hardy County Commission to seek funding for such a facility.

A computerized geographic information system (GIS) file accompanies the report. The GIS shows the location and configuration of public water service, sewer service, and twenty five prominent natural springs developed specifically for the study, as well as a host of existing data on Hardy County.

Summary recommendations are included in the final chapter.

The Hardy County Report states that water quantity in the Hardy County aquifers appears to be abundant; however, problems with sustained yields from wells result from low porosity and poor hydraulic conductivity. This indicates that while water may be present in the aquifers, it moves slowly through the aquifers and does not recharge the well rapidly enough to sustain a higher yield. While drilling a well deeper may result in greater storage in the bottom of the well, deeper wells will not increase the recharge rate of the well and will not increase the total daily yield

- 8. The EIS gives a cursory analysis of alternatives. It would be useful for the document to include in an appendix the calculations made to determine wetland requirement for flood control (page 17).**

Response: The alternative for using wetlands for flood water detention as an alternative to constructing the impoundments was evaluated in accordance with the EPA publication (<http://www.epa.gov/owow/wetlands/pdf/Flooding.pdf>). An explanation of how the amount of wetlands necessary for reducing peak flood elevations was calculated has been added to the text.

- 9. It remains relevant and is recommended that historic water quality data be evaluated, and new data collected in order to determine the improvement achieved by the operation of the new dams that were constructed in the watershed over the last decades (Sites 4, 10, 27). This could be used to determine success of the projects, if changes in design or approach would be useful. It would be helpful to document and present specific sampling locations and indicator parameters for monitoring. It is our understanding that funds have not been made available in the past and are not proposed for water quality monitoring associated with these projects.**

Response: Water quality monitoring following the installation of the first three Lost River impoundments has not been a requirement attached to the US Army 404 permits as permit conditions. Additionally, funding constraints have not enabled NRCS to monitor water quality

below the Lost River impoundments to determine the effects to the Lost River Subwatershed. NRCS would welcome the opportunity to work with EPA and other entities to design and implement a post-project monitoring program. Funding for such work; however, remains a concern.

10. **Protection of a cold water stream resource is an important goal of government agencies. EPA is pleased that the DEIS does discuss design features that will be included to address reducing the thermal impact of the dam. As this design has been used on other structures, it would be useful to be collecting thermal data to support that the design is effective. The data in Appendix D does provide some support of the design. Data for up and downstream would also be beneficial. It was our understanding that funds have not been set aside for thermal monitoring for the series of projects.**

Response: See response to item #9.

11. **The Second DEIS states that an “aerial survey made in November 2004..... documented 32,773 linear feet of severely eroded streambank along the main stem Lost River, as well as 6,801 linear feet impaired by bulldozer activity” (page 35). EPA is grateful that additional information was included to try to support project need. It is difficult to determine if the area that will be treated by the new structure is the area that is identified as being impaired, as the report is not specific in locating the area of impairment.**

Response: The aerial survey in November 2004 was made by the Cacapon Institute over the main stem of the Lost River. Shape files obtained from this non-profit organization indicate that all of the bulldozer activity (6,801 linear feet) was located along Lost River south of Mathias. This area is upstream of the existing and proposed Lost River impoundment locations. The areas of severely eroding streambanks were all identified on Lost River north (downstream) of Mathias. This included 3,640 linear feet upstream of the mouth of Lower Cove Run (proposed Site 16) and 29,133 linear feet downstream of Lower Cove Run.

Does chemical data in from the downstream sections of Lower Cove Run suggest impairment associated with erosion? Selection of an appropriate alternative would be better justified if water quality problems were identified using data specific to the area that will benefit from the proposed structure.

Response: There were no chemical water quality data collected from the downstream sections of Lower Cove Run. Water quality samples collected from the vicinity of the proposed impoundment and upstream were believed to be indicative of water quality conditions farther downstream. Laboratory analyses of the water quality parameters often associated with soil erosion (phosphorous, phosphates, total suspended solids and turbidity) did not suggest impairment associated with erosion. However, sediment deposits, high sediment bedloads and unstable channel characteristics indicative of stream impairments associated with erosion were observed along the lower reaches of Lower Cove Run. These observations were made by NRCS

personnel from 2005 through 2008 while performing environmental investigations on the Site 16 project area.

See NRCS response to EPA comment 9.

- 12. The Second DEIS does not fully evaluate or quantify secondary or indirect impacts of the proposal. This would include, as stated in our earlier comments, residential or commercial development associated with the proposed water supply system, appurtenances of the system, thermal changes in the stream, fish passage issues, changes to hydrology that could affect remaining wetlands, invasive species. It is understood these changes may be long off, though it is uncomfortable and unfitting to have the impacts associated with a primary purpose of the project not be evaluated in the EIS. It could be argued that the water distribution system is a direct impact of a connected action; this would include impacts of construction of the line and associated facilities (such as pump stations or treatment) and should be evaluated in a single document.**

Response: Potential effects of the water treatment and distribution system proposed by the Hardy County Public Service District are discussed in the Second DEIS in the Cumulative Impacts section (pages 68 through 83). The proposed water system will initially utilize the water supply source at Site 10 (Parker Hollow). The Public Service District will continue to pursue the installation of this system irrespective of the construction of the impoundment at Site 16. To attempt to evaluate or quantify any secondary or indirect impacts perceived to be associated with including 400 acre/feet of rural raw water supply at Site 16 is not reasonable and would be speculative at best. NRCS believes the potential effects of the water supply component of the Site 16 impoundment, and any effects associated with the water treatment and distribution system that may eventually utilize this supply source, are sufficiently analyzed and discussed in the Cumulative Impacts section of the Second DEIS.

- 13. The Second DEIS has expanded and improved the cumulative impacts analysis. The analysis does not incorporate a baseline as described in CEQ guidance. A baseline is used to compare present and predicted future condition of resources (selecting resources that will be impacted by the project). Specific values for amount of resources, for instance acres of forest, wetlands, etc should be quantified for the past, present and likely future to determine trend and significance of losses. Elements of the water distribution system associated with Dam 16 are a direct impact of the purpose of the project, and should be evaluated as direct or minimally secondary impact (not cumulative).**

Response: NRCS believes this information is included in the Second DEIS. Specifically, baseline information pertaining to forestland, farmland, wildlife habitat, wetlands and perennial streams is discussed in the Cumulative Impacts section on pages 79 through 83.

- 14. The cumulative impact analysis should point out that though resources such as forest or wetland can have proposed mitigation, the function of the created resource can often be delayed in time by many years.**

Response: Comment acknowledged. A statement (will be) has been added to the Final EIS indicating that mitigation measures may require time to achieve a desired level of functionality.

- 15. Mitigation of unavoidable impacts is essential to the project and is an important addition to the new document. The conceptual mitigation proposed should be further developed for the FEIS, including ratios, maps and conceptual design for wetlands, streams and forest.**

Response: NRCS and the project proponents have consulted, and will continue to consult, with state and federal resource agencies to advance the development of mitigation proposals and plans associated with the proposed Site 16 impoundment. Consultations with the WVDNR in Elkins have been very helpful with the development of a conceptual mitigation plan for this project.

The DEIS states (page 104) 3,040 linear feet of Lower Cove Run will be eliminated and references Table 1; it is not evident that Table 1 includes any relevant information to Site 16.

Response: The reference to Table 1 (on page 107) has been removed.

Alternatives analysis, documentation and acceptable mitigation for the Section 404 application will be addressed during the application process. Is there a proposal to replace loss of woodland by the project?

Response: As much existing forestland as possible will be retained within the project area. Some forest areas will need to be cleared in order to construct and operate the impoundment facilities. Present plans for forest mitigation at Site 16 will be to allow certain areas in the flood storage pool and areas adjacent to the auxiliary spillway to grow-up and become forested through the process of natural succession. There are presently no plans to re-establish forested areas by extensive artificial planting.

The document has been reviewed for Environmental Justice (EJ) issues with the following comments submitted for consideration:

- 1. The Second DEIS does not provide the background material to document the procedure used to identify areas of potential EJ concern. Information related to the make-up of the community impacted by and in close proximity of the project is not provided. Generally, demographic information and economic information such as poverty level data or low-income status for the area affected by the project is compared to a state/or local benchmark. The County information is presented in the Summary; information for the project area is not specified. If Hardy County is**

Response: Background materials used to evaluate Environmental Justice concerns is listed on page C-6 of the appendix. Demographic information for Hardy County, which is representative of the smaller geographic area of the Lost River Watershed, is the appropriate unit of analysis for demographics. For a benchmark perspective, a comparison of Hardy County demographics to national demographics is contained on page 2 of the Summary. Such information is included on pages 1, 2, and 67 of the 2009 Second DEIS. The data indicates there are no tribes and no minority populations disproportionately affected as a result of locating the Site 16 impoundment on Lower Cove Run. This indication is supported in that no tribal entities or minority populations have been identified during the public participation process (early planning meetings, environmental scoping meetings, public workshops or conservation district or other local government monthly meetings).

It is important to understand that watershed projects are focused on addressing the resource concerns of a specific landscape such as a watershed. The location of a watershed impoundment is wholly determined based on the physical attributes of the drainage area – i.e. tributary locations relative to the damage area, topographic and geologic suitability of a site for an impoundment, etc. Once the location is determined, it is appropriate to fairly compensate effected landowners, regardless of their demographic status. Information on effected landowners is included on page 116 of the Second DEIS. The application of federal laws such as the Uniform Relocation Assistance and Real Property Acquisition Act ensure that effected landowners at Site 16 will be fairly compensated.

This project will not cause disproportionately high and adverse human health effects on low-income or minority populations. The project is actually designed to prevent potential adverse human health impacts from flooding. Any potential low-income and minority populations have been kept informed of project decision-making through public meetings on the project and EIS. Also, no environmental justice concerns were identified through these meetings.

2. The extent of community involvement in the planning and decision making process is not included in the discussion of EJ. This typically includes report of strategies used to assure the appropriate participation of impacted residents.

Response: Conservation district supervisors and county commissions are part of the community. They, as well as others from the local community, have been extensively involved in all aspects of planning and decision-making of this watershed project. This project has been ongoing for 35 years, giving ample opportunity for community involvement at local conservation district meetings, local county commission meetings, public service district public meetings, and other planning meetings that serve as a local forum. Further, this issue was not raised by agencies or attendees at the scoping meeting for this project. The landowners impacted by the construction of Site 16 have been afforded an opportunity for appropriate participation and NRCS has fully complied with the public participation requirements of NEPA and other applicable laws and statutes.

Responses to WV Division of Highways comments submitted May 4, 2009.

- 1. WV [route] 59 follows Lower Cove Run. The crest of the proposed dam will be at a higher elevation than WV 59 in an area approximately 1.1 to 1.5 miles from WV 259. This will increase the risk of flood damage to the road and create a potential hazard to the traveling public. We believe the roadway should be relocated to raise it above the elevation of the top of the dam.**

Response: The impact to WV 59 would be experienced approximately 0.6 miles upstream of the proposed structure. At this location there is approximately 150 feet of roadway that is below the elevation of the crest of the auxiliary spillway (the level of the 100-year flood pool). Based on discussions between NRCS and WVDOH, it was determined it is not WVDOH intentions that the road be relocated or elevated to the top of the dam elevation; but, to be elevated in the existing location to the elevation of the crest of the auxiliary spillway (elevation 1560.3). Provisions to elevate this section of WV 59 will be included as a component of the project.

- 2. The outfall from the emergency spillway will flow to an unnamed tributary of Lost River that goes through a culvert under WV 259 on its way to the river. If this unnamed tributary overflows its banks, the water may enter Lost River upstream of the bridge that carries WV 259 over Lost River. The culvert or the bridge, or both, may have to be upgraded to accommodate the potential increase in flow from the emergency spillway.**

Response: The impact to WV 259 would be experienced between the outlet of the auxiliary spillway and the confluence of Lower Cove Run and Lost River. Between the two locations along WV 259, there are two bridges and one culvert. Your letter indicates concern with the potential impacts to these structures resulting from construction of the dam and flow discharging from the auxiliary spillway. The auxiliary spillway would not be activated until runoff resulting from a rainfall event exceeding the 100-year event was experienced in the Lower Cove Run watershed. Based on NRCS modeling of the Lost River watershed for the 100-year event, the water level at the area of concern will be slightly reduced with implementation of the project. Further, portions of WV 259 between the upstream bridge and the bridge over Lower Cove Run will be inundated during rainfall events that exceed the 50-year event. In which case, any flow being discharged through the auxiliary spillway will combine with flood waters from Lost River and proceed over WV 259. As such, the concerns described for WV 259 would be minimized during larger storm events.

- 3. Also, we [WVDOH] are planning to replace the WV 259 bridge over Lower Cove Run. Your flood control project will change the flow at this bridge that may affect the design of the new bridge. Please send us the hydraulic and hydrologic data from your project that is relevant to our roads and bridges.**

Response: The Hydraulic and Hydrologic report (dated July 2008 – NOT FINAL), and the NRCS analyses for WV 59 for areas upstream of the dam have been provided to WVDOH. NRCS will communicate with WVDOH as more detailed information is available.

Responses to Comments on Second Draft EIS Lost River 16 submitted by WVDNR by letter April 27, 2009.

- 1. Lower Cove Run is listed as a “high quality stream” by the WVDNR and as a “B2 Trout Water” under Title 47 of the West Virginia Water Quality Standards. Lower Cove Run has been degraded in its Lower reaches by agricultural activity resulting in poorer quality trout habitat within the project boundaries and downstream to its confluence with Lost River. Lost River is considered a cool water stream and is stocked with trout in the spring and fall. It is not unconceivable for native trout to venture into the Lost River during favorable water temperature conditions given that common cohorts, fantail darters and dace, are commonly collected in Lost River’s mainstem. The project will sever the connection of Upper Cove Run to Lost River. Headwater functions such as transport of nutrients derived from the processing of detritus, coarse organic matter (COM), fine particulate organic matter (FPOM) and dissolved organic matter (DOM) will be severely disrupted with the completion of the project.**

Response: The prospective impacts to brook trout in Lower Cove Run are discussed in the Environmental Consequences Section – Aquatic Resources on pages 45 and 46. This discussion concluded that the installation of the dam on Lower Cove Run would be a barrier to fish movement between the upper reaches of Lower Cove Run and the lower reaches of Lower Cove Run and the Lost River mainstem. References to Lower Cove being listed as a “high quality stream” and a “B2 Trout Water” will be added to the text in the Final document. In addition, references to the disruption of nutrient transport resulting from dam construction will be added to the discussion of water quality.

- 2. The DNR is still concerned that recreational fishing is considered by the NRCS and the sponsors as an “incidental” project benefit. Value derived from recreation accounts for approximately thirty percent of the annual dollar value benefits from the proposed project and the project could not achieve a positive cost benefit ratio (CBR) without the “incidental” recreation. We request that a signed agreement between the sponsors and DNR/DEP be in place prior to the start of construction on the project that guarantees public access to the project for the life of the project. If for any reason public access is denied for recreation, specifically fishing, the project sponsors will be required to compensate for the loss of recreational opportunities.**

Response: NRCS appreciates WVDNR’s concerns regarding assurances that recreation will remain a viable incidental use of this proposed project. NRCS will work with project sponsors to develop an agreement pertaining to public access for recreational uses similar to the one created for Lost River Site 10 at Parker Hollow.

- 3. The DNR is concerned that mitigation funding is lumped with the general construction budget. Unforeseen construction cost overruns could inadvertently cut into mitigation obligations. Mitigation obligations are as important as the physical construction of the dam. We will request that compensatory mitigation plans (CMP) be in place and pre/concurrent construction of mitigation as a 401 permit**

Response: NRCS agrees that mitigation measures are an important and required component of project implementation. NRCS will work with federal and state regulatory agencies to finalize the compensatory mitigation plan associated with this project prior to construction. NRCS further agrees that portions of the mitigation measures that will be proposed off-site or in areas outside of the construction limits for the dam and auxiliary spillway on-site will be constructed prior to or during dam and spillway construction. NRCS will seek to separate construction and mitigation expenses during the planning of future projects.

- 4. The DNR is pleased that the NRCS included lake habitat improvement projects in the referenced document. The final EIS for the project should state that lake habitat improvement structures will be part of the approved CMP.**

Response: Lake habitat improvement measures will be included in the compensatory mitigation plan.

- 5. The document is vague relating to which parties will be financially responsible for the maintenance of the limited recreational facilities on the lake (trash pick-up, porta-johns, maintenance of access trail and ramp). The sponsors are claiming significant economic benefit from recreation to help meet CBR so it would [be] logical that the sponsors play a significant role in the maintenance of the recreational facilities.**

Response: See response to WVDNR comment 2.

- 6. The document requests a 1:1 ratio for unavoidable wetland impacts. State code requires 2:1 compensatory mitigation for impacts to PEM wetlands and 3:1 for PSS wetlands. Given the fact that the subject wetlands have severely degraded functions by agricultural activities, a 1:1 ratio may not be an unreasonable request to replace the lost wetland functions. The 1:1 ratio, if approved, would only apply to restored/created wetlands. Enhancement of existing wetlands has been credited at a 5:1 ratio for other projects. The DNR would consider preservation of existing high quality wetlands at a 10:1 ratio. On page 106, the document states that the upper pool is predicted to have up to five acres of less than three feet water depth. The NRCS states that this area could be “enhanced” and they will seek wetland mitigation credit. Generally, the DNR considers any water depth over two feet as “open water” and, therefore, of limited value as wetland mitigation. We will request that a CMP be in place and construction of the CMP prior to or concurrently with impacts.**

Response: NRCS appreciates DNR’s elaboration of wetland mitigation requirements. NRCS will request consideration be given to allow for a 1:1 mitigation ratio for unavoidable impacts to project wetlands due to the existing degraded functionality. Further discussions with state and federal resource agencies will be conducted to determine credit ratios allowable for

enhancements to wetlands not impacted by project construction, credit ratios for shallow water areas in the impoundment and other measures to improve the functionality of wetland habitats. Once approved, these measures will be included within the compensatory mitigation plan that will ultimately define conditions attached to the required Department of the Army 404 permit and the Section 401 state water quality certification.

- 7. On page 60 of the referenced document, the NRCS is claiming water quality benefits from the elimination of livestock from Lower Cove Run. Currently, approximately 20 head of cattle and a few horses routinely graze in the pastures that will be eliminated by the proposed project. The DNR does not argue that there may be some water quality benefits from the elimination of livestock that currently have unrestrictive access to the stream. However, the NRCS falsely asserts that this benefit may be nullified if Canada geese take up residence on the impoundment. According to the accepted USDA animal unit conversion ratios, one goose is equivalent to 0.0231 cow or 0.0062 horse. Therefore, it would take \pm 3,000 resident geese to produce the same amount of waste as 20 cows and five horses. This is an unrealistic scenario. Current federal waterfowl regulations restrict the use of shotgun shells to non-toxic shot so the inclusion of waterfowl hunting on the proposed impoundment would not pose a threat to the water supply function of the project and help protect water quality from the perceived threat of over abundant waterfowl.**

Response: Reference to the water quality benefits projected to result from the removal of livestock from the project area being possibly nullified by inhabitation of the lake by Canada geese will be removed from the final document.

U. S. Department of the Interior May 26, 2009.

No response necessary.

WV Division of Culture and History May 5, 2009.

No response necessary.

Joem Webster comments provided at May 14, 2009 public workshop.

How appropriate that the 2nd EIS was issued on April Fool's Day. How long is it going to take to beat this monster until it is finally dead. This 2nd EIS is a replica of the 1st EIS with just a few word changes. There has never been and still is no concrete data to back up their statements. There were no studies on river flow data for example. The citizens have repeatedly since 1974 signed petitions, written letters, etc. that they have not wanted any of these dams. We received more rain in 1985 than Moorefield, yet people got up and went to work not knowing there was any problem. Hardy County is one of the two driest counties in West Virginia. A very few people want public water. We all have wells, which suit us just fine. If there would be any development, you would not have enough water to supply.

You cannot manufacture water. The WVU population study for the next 10 years conducted between 1990-2000 was 1.5% over those 10 years. The U.S. Government in the same time frame projected less than 1% for the entire state of West Virginia. The Hardy County Commissioners predicted a 25% growth. What are they thinking? Have you seen all of the houses for sale? People are moving out, not in. This area will never be the metropolis they envision. No data has been shown that we need Lower Cove Dam #16 for flood control or water supply. In fact, it was stated in the Moorefield Examiner by Ed Kesecker and Don Biller that the Kimsey's Run and Parker Hollow Dams would be a sufficient water supply for the foreseeable future.

Response: Comments noted.

Patrick Webster comments provided at May 14, 2009 public workshop.

- 1. Five counties in southern W.Va. were flooded the 1st week in May. The flooding destroyed at least 100 buildings, knocked out power and flushed trash, debris and at least 1 mobile home downstream. Why are we spending \$26 – 29 million dollars on another dam in Lost River where we haven't lost that many buildings or endangered 7 miners trapped under ground because of high water in 35-40 years. The NRCS claims 1 million in flood damage per year caused by flooding of Lost River but there is no hard data to substantiate these claims. The only data they have is FEMA spending \$350 thousand for clean up after the 1985 flood. There was no lost power or buildings destroyed here or lives endangered by flooding.**

Response: Comments noted.

- 2. Isn't data claimed in this EIS all estimates that could probably be found on any stream in W.Va. or the U.S.**

Response: No. The information in the Lost River EIS is specific to the Lost River Watershed.

- 3. This is alluvial (water borne) soil that makes up the fertile low lands of the valley.**

Response: Most of the soils within the floodplain areas of the Lost River Valley are classified as alluvial soils.

- 4. How was the public need determined and who determined it. Was the public consulted.**

Response: The Hardy County Commission and the Potomac Valley Conservation District, on behalf of the citizens they represent, requested assistance from NRCS to address a public need. Technical specialists from the NRCS evaluate alternatives and recommend solutions that will address the needs. There has been extensive public involvement in this project and it is described in the "Consultation and Public Participation" section of the report.

- 5. If the public service commission was unable to get enough people (80% of the population) in the revised distribution plan to sign up for public water what leads you to believe the rural water supply plans are economically feasible.**

Response: The Hardy County Water Resources Report concluded that additional water supplies were needed in the Lost River Watershed. Additionally, the Water Supply Report in Appendix E showed population and housing trend data that supports the need for a stable and dependable rural water supply. NRCS believes both of these reports are accurate and provide adequate justification for adding a raw water supply source to Lost River Site 16.

- 6. Would NRCS be able to tell the people who are gathered here today, what role the future planned ‘no occupational zones’ play in this adamant, unfounded PUSH for water impoundments in Hardy County?**

Response: NRCS does not designate such zones and is unfamiliar with this concept.

- 7. Why did NRCS not examine other potential sites instead of relying on sites selected on the basis of an EIS prepared 35 years ago.**

Response: Sites are selected based on the physical characteristics of the watershed, e.g. topography, soils, geology land use, drainage area controlled. As indicated on page 14 of the April 2009 Second DEIS, the entire watershed was evaluated for potential sites. Ultimately, the recommended plan included five sites that were strategically located in the watershed to best address the flooding problem. The drainage pattern of Lost River and the physical landscape have not change sufficiently to create additional sites for examination.

Jerry Dove comments provided at May 14, 2009 public workshop.

Move dam up to Willow Tree’s about 2 miles up stream it will be more cost effective.

Response: Moving the location of the dam about 2 miles upstream would impact the drainage area controlled by the dam and the cost of construction of the structure. The geology at the site is radically different and would require extensive work to tie the dam’s abutments into the sandstone rock at that location. Extensive excavation of rock would be required to create the auxiliary spillway or the dam would need to be designed to allow flows to overtop the dam. The overtopping facility would require the use of more expensive alternative construction materials, e.g. roller compacted concrete. Also, costs associated with road relocation would be increased as the road bed would need to be excavated into the steep, rocky valley walls in this area. By moving the dam upstream, and reducing the drainage area, it is likely that a larger water supply storage pool would be required to meet the criteria for sustained yield. Flood reduction benefits would also be reduced because of the smaller upstream drainage area. For the above stated reasons, an upstream site would not be more cost effective.

Stephanie Slater comments provided at May 14, 2009 public workshop.

1. Why did NRCS revoke the July 2007 Record of Decision in 2009?

Response: Additional analyses and investigations were completed following the issuance of the Final EIS in April 2007. The Record of Decision (ROD) issued in July 2007 was withdrawn in order to add this additional information to the document and re-issue it as a Second Draft EIS for public review and comment.

2. In the memo sent out by NRCS, Kevin Wickey wrote: “In the event we move forward with this project, we will complete appropriate environmental analysis and public involvement, and issue a new decision.” In a newspaper article, NRCS reported that it would take several months to do a new draft. Yet, this second draft was completed approximately 6 weeks after the ROD was revoked. Specifically, what new information, new alternatives, and/or new analyses are contained in the 2009 Second Draft EIS that were not included in the 2007 Final EIS? Please provide a comparison of the two documents (e.g., a redline/strikeout version that would show all of the changes between the 2007 Final EIS and the 2009 Second Draft EIS).

Response: As indicated in the previous response, several investigations and analyses were completed following the issuance of the Final EIS and the ROD. Because these investigations were complete, the results could be incorporated into the Second Draft of the document without great expenditure of time. Specifically, new information in the Second Draft EIS includes the wetlands delineation, the additional Phase I and the Phase II archaeological investigations, additional discussion of cumulative effects, additional information pertaining to new housing and the water distribution system and a proposed compensatory mitigation plan. With regard to document comparisons, EPA suggested (and NRCS concurred) that a short discussion of the document history be added to the 2009 Second Final EIS. This will assist you in determining the differences between the two documents.

3. What are the sources of funding for this proposed project? If federal stimulus funds are expected to be used, by what date must construction start in order to qualify for the federal stimulus funds? What would constitute start of “construction”?

Response: Funding for the Lost River Watershed Project is provided through Congressional appropriations. There is no stimulus funds used for this project. The construction phase of a project begins when a contract is awarded and the successful bidder is given the notice to proceed.

4. Why must the project meet both flood control and water supply needs?

Response: There is no requirement that this project must address both flood reduction and water supply needs. The request for rural raw water supply storage to be included in the Site 16 impoundment was made by the local sponsoring organizations in Hardy County. This request was made and endorsed by elected government officials who represent the citizens of Hardy

County. In this case, both needs are addressed because it is more cost effective and efficient to provide flood water detention and water supply within the same structure. This would prevent the need to construct two single purpose impoundments at different locations that would potentially result in twice the cost.

5. I could not find an analysis of what Site 16 would be protecting, nor what the other three dams are already protecting. Please include in the final EIS.

Response: The floodplain areas along the mainstem of the Lost River that are downstream of the three existing impoundments and proposed Site 16 on Lower Cove Run are the areas targeted for reductions in peak flood elevations. Segments of the tributaries downstream of where the impoundments are located will also benefit from reduced flooding. See the floodplain maps 1 – 10 in Appendix B.

6. When does the public’s opinion matter? Isn’t it clear from the negative public opinion on the Baker water project and from the lack of people to sign up for public water that citizens in this valley do NOT want public water? Why is it necessary to provide another water source that people do NOT want?

Response: The request for rural raw water supply storage to be included in the Site 16 impoundment was requested by the local sponsoring organizations in Hardy County. This request was made and endorsed by elected governmental officials who represent the citizens of Hardy County.

7. The Army Corp of Engineers was on site in July 2008 to complete the wetland jurisdictional determination. Why is this report not included in the draft EIS? In the draft, you only make reference to “conversations in the field.” Please include the report in the final EIS.

Response: The jurisdictional determination for the wetlands and waters of the U.S. was not included in the Second Draft EIS because it has not been provided to NRCS by the Corps of Engineers. As stated, the site visit was conducted in July 2008 and verbal communications from the Corps representative at that time was that the Corps of Engineers and EPA concurred with the wetlands delineation report prepared by NRCS in October 2007. If the jurisdictional determination is received prior to the issuance of the Second Final EIS, it will be noted accordingly.

Mark Wolfe Comments submitted by mail dated May 24, 2009.

1. Proposed need for flood control: There is no need for a costly solution for flood control. During past floods (1985/1996) the damage was mainly to fences and a few cows. The premise that this dam would prevent property damage and loss of life through a multi-million dollar construction project is ill-conceived and wasteful.

Response: Damages to agricultural lands, fences and livestock downstream of the impoundments and along the mainstem of Lost River are included in the determinations for flood

damage reduction that will result from the installation of the Lost River Subwatershed impoundments. Fences, livestock, crops, and agricultural infrastructure have value to the landowners along Lost River and are legitimate categories when evaluating flood losses. The positive cost-benefit analysis supports the need for flood damage reduction.

- 2. Water Supply: There is no need for a costly project to provide a water supply for this extremely rural, low residential density area. This improvement would create a source of water, but does not address treatment and distribution issues or funding. Residents of Baker, W.Va. recently rejected getting hooked up to a very costly water supply project, because the small number of users made for a relatively high monthly bill. The future expansion of the poultry industry and increased residential housing development cited in the work plan are dubious concepts not proven out by current economic trends and statistics. Three other dams/impoundments already provide a raw water source for “future needs,” making this proposed facility extremely redundant and un-necessary.**

Response: Treatment and distribution of the water is a separate activity and is not part of the mission of NRCS. The Lost River Site 16 impoundment will provide a raw water supply for future demand as documented in the Hardy County Water Resources Study. Trend data included in the water supply report in Appendix E does not support the commenter’s position that there will be no growth in the Lost River Valley.

Only Site 10 at Parker Hollow presently contains a dedicated water supply. Lost River Site 27 and Site 4 do not include allocations for raw water supply. The permanent pools at Sites 4 and 27 are allocated for sediment storage. At such time as sediment accumulations occupy this space in the future, the pool areas of these two impoundments will be either eliminated or greatly diminished in size.

- 3. Waste of taxpayer money – This project would be a phenomenal waste of government funds! In the current economic climate it is essential that money be spent wisely on projects that benefit our country and our infrastructure needs. This is a wasteful project with no real usefulness.**

Response: Comment noted.

Cheryl Edwards comments submitted by mail dated May 24, 2009.

According to the water resources study for Hardy Co., which was commissioned by the Hardy Co. Commissioners, there is enough water in Dam Sites 4 and 10 for the foreseeable future. Why should we build another dam for water supply using tax dollars that citizens cannot afford now?

Response: Dam Site 4 has no dedicated water supply storage and would have to be modified to incorporate a dedicated raw water supply source. The modification to dam Site 4 would exceed the cost of adding raw water supply to Site 16.

Dale Kemper comments submitted by mail dated May 24, 2009.

The cost of modifying Kimsey's Run Dam for water supply is approximately one-third of the cost of building a new dam at Site 16 for water supply. Economically it is illogical to spend tax dollars for a new dam to serve the same purpose.

Response: Modification of the Kimsey's Run Dam would not serve the same needed purposes as building Site 16. Site 16 will also provide flood damage reduction benefits and incidental recreation. Furthermore, the cost of modifying Site 4 (Kimsey Run) to incorporate water supply exceeds the cost of adding water supply to Site 16.

Site 16 is designed as a flood control and raw water supply reservoir. If the rural water supply was moved to Site 4, an impoundment at Site 16 would still be needed for flood control in the Lost River Subwatershed. The cost of building Site 16 for flood water retention and modifying Site 4 to include rural raw water supply exceeds the cost of building Site 16 to address both purposes.

Anne M. Webster comments submitted by mail dated May 22, 2009.

- 1. I feel that this is a waste of \$6.5 million in federal funds that could be put to better use. There are other places that a flood control dam could be put. This year there has been flooding in the southern part of West Virginia. Couldn't they use a flood control dam in that part of the state?**

Response: NRCS is responding to flooding in southern West Virginia. The solutions to flooding problems vary according to the local conditions. In some places, dams are the best solution. In other areas, there may be topographic, geologic, or other issues that limit dams as a solution.

- 2. One thing that I have noticed is that there is not much difference between this 2nd draft EIS and the 1st one. In the 1996 Flood there were no damages at Lost City. However, there was bridge that washed away in Mathias on Upper Cove Road. In the flood of 2003 we had no damages either.**

Response: See response to Comment 2 submitted by Stephanie Slater May 14, 2009 for differences between the two draft reports.

- 3. I want to talk about the native trout in the Lower Cove Run. According to Title 47 Legislative Rule DEP Water Resources Series 2 Requirements Governing Water Quality Standards section 2.19 the Lower Cove Run sustains year-round trout populations. This EIS says that there were only 3 trout found. Why is it then that the Lower Cove Run was up for protection under Tier 3? To me that says that there is significant numbers of native trout in the stream.**

Response: According to Title 47, Interpretive Rule, Series 2A, Designation of Tier 3 Waters, portions of Lower Cove Run that are "high quality waters or naturally reproducing trout streams located within the boundaries of National forests bounded on both sides of the water by

public land, will be designated Tier 3 waters.” This rule is based upon the presence of reproducing trout and does not imply abundance.

Most of the portions of Lower Cove Run meeting these criteria are located well upstream of the proposed Site 16 impoundment. Two small segments of this stream within the upper flood water detention pool area of the project are presently bounded on both sides by Forest Service lands and may qualify for Tier 3 designation. These lengths of the two isolated segments are estimated to be 550 feet and 1340 feet, respectively. A discussion of brook trout is included in the Second Draft EIS, Environmental Consequences Section, Aquatic Resources (pages 43-47).

- 4. Where are the pictures of structures that will be protected by this dam? Does that mean that there are no structures that will be protected? Also why are there pictures included of dead animals?**

Response: Yes, there are structures that will be protected. Please refer to the floodplain maps in Appendix B. The flood prone areas depicted on these maps include infrastructure in the watershed, structures, roads, and other improvements.

- 5. Why put a dam in a river that barely has water in the summers for farm animals to drink? Most summers you have to go lay down in the river and roll around to find any water in the Lower Cove Run. There are summers that I am thankful that my father built a pond on our farm so that our cattle would have water to drink.**

Response: By placing a series of small dams on tributaries, the flood flows into Lost River can be controlled, thereby reducing flooding when tributaries like Lower Cove Run receive large amounts of runoff. The water storage capacity at Site 16 could also supplement low flows in Lower Cove Run and the Lost River during drought periods.

- 6. I have heard it said that this dam is going to [be] used as a water source. I have to wonder how many people will sign up for this service. I can tell you that my neighbors are very satisfied with their well water. I have never heard of any of my neighbors having any trouble with their wells. I think that the fact that people will have to turn off their wells and not ever be able to use them again to get public water from the dam will turn most people away. Again this is a waste of tax payer and federal money.**

Response: Comment noted.

- 7. Your wetland map is a joke. You account for less wetlands than what there really is. For years I can remember my father not being able to get on what was our hay field to make hay because he said that the field was too wet. My father also would say that you would never cross the ditch in the field because of the fact that you were sure to get stuck because of the fact that the ground was always wet. When my mother took over the farming there were times when she didn't get on the field to make hay. What are your standards for determining what is or is not wetlands?**

Response: Wetlands within the proposed Site 16 project area were delineated using the procedures and methodologies outlined in the *Corps of Engineers Wetlands Delineation Manual* – Technical Report Y-87-1 – released in January 1987. This manual is the current guidance for wetland delineations utilized by the Corps of Engineers, U.S. EPA, NRCS and other resource agencies. Wetland delineation was conducted on site by an NRCS biologist, NRCS hydraulic engineer and NRCS soil scientist. A specific description of methodologies used to evaluate the presence hydrology, hydric soils and hydrophytic vegetation is contained on page 4 of the *Determination and Delineation of Wetland Areas Within the Lost River Dam Site 16 Project Area Construction Limits* Report prepared in October 2007. This report is contained in its entirety in Appendix D of this report. Verbal concurrence with the findings of this delineation report was provided by U.S. EPA and the Army Corps of Engineers during a field review conducted July 23, 2008.

- 8. Years ago it was suggested that other locations be looked at for possible sites to build a dam. Why hasn't other sites been looked at for the building of a dam? Why is it that the Lower Cove Run site was the only site ever looked at?**

Response: As many as 30 sites have been evaluated during the planning of this project. The site on Lower Cove Run is well suited for the construction of an impoundment and is strategically located upstream of major damage areas.

- 9. Also it is very convenient that very shortly after the reversal of the decision was published that a 2nd draft EIS was published. Is it safe to say that the reversal of the record of decision was just a farce? Was it just a ruse to make people forget about the dam so that the dam would be slid in under the nose of the opposed?**

Response: See responses to comments 1 and 2 submitted by Stephanie Slater May 14, 2009. The Record of Decision was withdrawn pending the re-issuance of a Second DEIS.

Elizabeth Webster comments submitted by email May 26, 2009.

- 1. Another concern that I have related to the EIS that you published in April 2009 concerns the number of acres that you show as being identified as wetlands. I think that you have deliberately underestimated the total acres of wetlands that will be inundated by this impoundment. The entire bottom area, from the base of the hill to the Cove Run, had previously been identified by NRCS as being wetlands. Yet in your latest EIS, you identify only the area adjacent to the ditch as wetlands. Thus you have identified a very minimal area. Why?**

Response: See response to comment 7 submitted by Anne M. Webster May 22, 2009.

- 2. I believe that most of the bottom land that you will take from the Webster's and the Foltz's is wetlands and that the total acreage involved in this project exceeds 30 acres.**

I believe that our wetlands do a very good job of flood control and that this dam is totally unnecessary.

Response: Comment noted. See response to comment 7 submitted by Anne M. Webster May 22, 2009. Please refer to the Wetland Delineation Report in Appendix D. The methodology is described within the report. Also, please refer to the “wetland restoration” alternative that was evaluated for flood control in the Second DEIS (page 17).

Elizabeth Webster comments submitted by email May 27, 2009.

- 1. The lack of factual evidence to substantiate your claim of flood damages bothers me. If the reason for building this dam was to prevent property loss or to minimize the possibility of loss of human life, you would be able to show with pictures and other verifiable proof that such loss had occurred during the past 40 years. You (the sponsors of this project) claim that there are over a million dollars in flood damages annually. Where did these losses occur? What years did they occur? Where is the proof?**

Response: Please refer to the floodplain maps in Appendix B that show the area of flooding with the project compared to the inundation without the project. These maps show the damage area in the Lost River floodplain. Appendix C describes the methodology used to model flood damages. See Hydrology and Hydraulics (C6 – C8) and Economics (C5).

- 2. On page 6 you state “Refer to the investigation and Analyses section in Appendix C for more information on flood damage determinations.” No list appears on this page or anywhere else in this document nor do you give photographs or copies of newspaper articles showing any flood damage in the Lost River Valley. Where is the detailed list of the structures that had flood damages from previous floods? On page C-5, you attest that through personal interviews you learnt about the flood damages. Where are the copies of these interviews? We asked that you include the names and addresses of persons that you talked with related to flood damages. You refuse to do so. Is this because these persons do not live or own land in the Lost River Valley?**

Response: See response to comment 4, EPA letter May 27, 2009.

- 3. You have had nearly 40 years to compile data to prove annual flood damages, yet none are contained in your document. Where is the chart or table showing specifically what was lost or destroyed or damaged and the year that the losses occurred? Where is documentation for each supposed flood and the amount of damages the Lost River Valley sustained? Where are the pictures of the damages from any of the reported floods?**

Response: See response to comment 4, EPA letter May 27, 2009.

4. **Where are the pictures of the structures that this dam will protect? I noted that you took the time to take color photographs of the area where the dam will be constructed, but did not include any photographs of actual structures that this dam will protect. Why not? Is it because there aren't any barns or houses or other out buildings that this dam will protect???**

I find it unconscionable that you continue to mislead persons who live out of the area with your misrepresentation of the facts. Show us the proof! Verify your claims of flood damage.

Response: Comment noted.

Elizabeth Webster comments submitted by email May 27, 2009.

1. **EMERGENCY SPILLWAY DESIGN CHANGED.** You have made major changes to the design of the emergency spillway which will require more land and will dump flood water onto land that you have not investigated and which requires additional loss of farmland. What prompted the change in location/design of the emergency spillway? Was an investigation done to determine if the new design would create irreparable harm to land that might be damaged by the overflow water? Also, I could not find any evidence that you investigated the impact on the Garrett property or the Biller property where the storm water will be dumped. Is this going to cause massive erosion on the land or are you planning to dig a ditch from the end of the emergency spillway to the Lost River. Did you include the cost of such ditch or the cost of an easement from the dam to the Lost River. Did you investigate the impact of additional water being added to the Lost River at this point and the impact on the bridge and the possible closure of Rt. 259 as a result of increased volume of water flowing into the river? Do you have an estimation of possible damages to the land this water will impact?

Changing the design of the emergency spillway...."resulted in a change to the land acquisition boundary. As a result about 49 acres of additional land area..." will be taken. [Pg C-11] This not only increased the cost of land acquisition, but raises other questions about future damage to the area where the emergency flood waters will be dumped.

You changed the design of the emergency spillway but you refuse to consider moving the dam upstream to lessen the impact on prime agricultural land. Why?

Approximately .4 of a mile upstream of the proposed site, nature has provided at the end of the ridge area, known to locals as "the willows", that could be utilized for this an impoundment. Moving the structure upstream save approximately 250 acres of farm land which includes some 30+ acres of wetlands. We have asked you repeatedly to investigate moving the structure, but you refuse to do so. Why? If you

can change the design of the dam, why can't you investigate another location on the same stream?

Response: The 1974 Work Plan shows the alignment of the auxiliary spillway (emergency spillway in 1974) south of the left abutment on the plateau discharging to the west. Flow exiting the auxiliary spillway would continue to flow to the west. The 2009 Second DEIS shows the alignment of the auxiliary spillway south of the left abutment; however, the exit of the auxiliary spillway has been shifted to the southwest. This alignment change was done because of a residence directly downstream of the earlier 1974 version of the outlet.

The auxiliary spillway will not be activated until there is a rainfall event which exceeds the 100-year event. In the event that the auxiliary spillway does flow, the discharge would exit the auxiliary spillway and continue to flow until reaching the Lost River floodplain. The 2009 Second DEIS indicates that the Lost River floodplain would be inundated with water during rainfall events exceeding the 100-year recurrence intervals. There would be some erosion of soil material in and downstream of the auxiliary spillway; however, this would be infrequent and could be repaired. The area between the auxiliary spillway outlet and the Lost River floodplain is identified as ASW Flow Easement on the Project Plan Map in Appendix B of the 2009 Second DEIS. The cost to acquire the flow easement was included in the land rights costs. The impacts to the Lost River floodplain relating to Route 259 and the bridges near the dam have been discussed with WV Division of Highways (See responses to WV Division of Highways comments dated May 4, 2009). The 2009 Second DEIS shows Route 259 being inundated between the Route 259 Bridge over Lost River and the bridge over Lower Cove Run. Therefore, before any flow exits the auxiliary spillway, Route 259 will already be under water in that location.

See response to Jerry Dove comment (from May 14, 2009 workshop) regarding the comment to consider moving the impoundment upstream to “the willows.”

- 2. OTHER ALTERNATIVES: One alternative you fail to seriously consider is to buy the floodplain. If the people living along the Lost River are suffering so much from continual flooding, I am sure they would be very willing to sell their land and move somewhere else. On page 15, you report that the floodplain totals 1,900 acres. At a cost of \$15,000 per acre (The amount that you gave Mr. Snapp for his land.) the total cost of buying the floodplain would be \$2,350,000. That's a lot cheaper than spending \$30+ million on one dam that controls approximately 7% of the drainage area.**

Response: “Floodplain Purchase and Relocation” alternative was considered on page 15 of the April 2009 DEIS. This alternative was dismissed. If the 1,900 acres of floodplain along Lost River could be purchased at \$15,000 per acre, the total would be \$28,500,000 which is approximately the same cost as that estimated to install Site 16. But, there would be no rural raw water supply storage, which is a purpose of this impoundment, and no additional incidental recreation benefits. A purchase of all 1,900 acres would have to be made in order to realize the flood damage benefits of acquiring 222.5 acres of private land and building one dam.

You have never seriously considered the “NO BUILD” alternative. On page 86, it states the No Action Alternative is “the alternative with the greatest net benefits.” Why is this not your recommendation?

Response: The No Action Alternative was not recommended because it does not meet the needs of flood damage reduction and water supply.

- 3. WATER SUPPLY: Why not renovate Kimsey Run Dam at a cost of \$3 million rather than spend another \$30 million for water supply for phantom people who may not live here in 50 years? Check the status of the water treatment plant at Baker. They have been unsuccessful in convincing people to sign up and the Arkansaw area is much more heavily populated than the Lost City area. Where are all the people that you claim need water? You count weekenders who spend two days during the summer months as full time residents. I believe that you have exaggerated you benefits and minimized the costs to make a viable cost benefit ratio.**

You include the benefits of water supply, but you fail to estimate the cost of getting that water to local residents. If you include the benefits, then a reasonable person would expect to see the cost also outlined. Taxpayers will pay for the dam and the treatment plant and the distribution lines. What is the estimated cost of the water treatment facility and why have you not included these costs in your EIS? Isn't Rural Development under the USDA umbrella of agencies? Isn't there funding derived from tax dollars?

Response: The Water Supply Report in Appendix E does not overestimate the number of residents. The report is based on the best available historic information and projected data for the region. The benefits for the raw water supply are determined according to methods outlined in Economic & Environmental Principals & Guidelines for Water & Related Land Resources Implementation Studies. Treatment and transmission of the water is not included in the costs or benefits for this EIS because it is a separate action.

- 4. NATIVE TROUT: The Lower Cove Run has native brook trout. Local fishermen believe that the population is reproducing in these waters, Did you interview local fishermen who could attest to this fact? The Lower Cove Run is one of two streams in the entire state that has native brook trout that reproduce. Why would you want to destroy their habitat?**

Response: No local fishermen were interviewed regarding native brook trout in Lower Cove Run. The Evaluation of Fisheries Resources in Lower Cove Run, Hardy County, West Virginia (Appendix D) reported the presence of three young-of-the-year brook trout in the 2005 survey. An additional discussion of brook trout is presented on pages 44 – 46 of the Second DEIS.

The statement suggesting that Lower Cove Run is one of only two streams in West Virginia that support reproducing native brook trout is erroneous. According to WV DNR fishery biologists, there are approximately 500 documented streams in West Virginia that have self-sustaining brook trout populations.

Elizabeth Webster comments submitted by email May 27, 2009.

1. **NEED FOR THIS DAM?** The fundamental question that you need to answer is this: *Is there enough flood damage to warrant the expenditure of millions of additional tax dollars?*

Response: Yes.

2. **NEW PROJECT?:** *Do you have authorization by Congress for this “new” project? It should be considered a “new” project because what was a five dam watershed initiative has now become a 4 dam project.*

Response: Authorization for the Lost River Subwatershed project, including Site 16, was approved in February 1975. Elimination of one dam site does not constitute a new project and reauthorization is not required.

You have drastically changed the original plan for the Lost River Subwatershed that was approved by Congress in the early 1970’s by deciding that you will not build Site # 23—Cullers Run. This changes everything and should invalidate most of the statistics that you copied from the 1974 EIS into your 2007 EIS and subsequently into the 2009 EIS. You decided to eliminate a structure which was intended to reduce flooding of Mathias. By eliminating that structure, you have dramatically reduced the benefits planned for homes, churches, and businesses located along the Lost River at Mathias and the area downstream, yet no mention is made of any revision of the original plan. You try to use the statistics for all 5 dams to show the benefits, but you no longer have five dams in your plans. It is a new plan with only 4 structures and the benefits derived should reflect the loss of protection that was attributed to Cullers Run.

Response: Modifications to the plan, including the elimination of Site 23 at Cullers Run, are reflected in the analyses of peak flood reduction and cost–benefit data contained in both the 2006 Draft EIS and the 2009 Second Draft EIS. Additionally, the costs and benefits were adjusted for the elimination of Site 23 as footnoted in Table 5 in the FEIS.

Where in the 2009 EIS can I find a list of homes and businesses that Site 16 will protect? Pictures? What property has been lost in the past 35 years due to flooding?

Response: The damage on the Lost River floodplain is depicted on the “100-year floodplain with project” maps in Appendix B.

3. **ERRORS in 2009 EIS:** One of the most blatant errors in the 2009 EIS was pointed out by the hydrologist at the Mathias-Baker Fire Hall on May 14, 2009. He claimed that Site 16 dam would hold 26 inches of rainfall. He told us the information in the 2009 EIS was copied from the 2007 EIS. Which means that the 2007 EIS is incorrect. If check TABLE 3 – STRUCTURAL DATA in the back of the 1974 Work Plan, (bottom of the page) you will find that Site 16 has a Capacity

Response: Structural Data (Table 3) in the 1974 Work Plan indicates the total capacity of the Lost River Site 16 structure to be 5.38 inches. This volume is to the auxiliary spillway (emergency spillway in the 1974 Work Plan) crest elevation of 1571.0 feet. Of the 5.38 inches, 0.34 inches are sediment volume, 4.22 inches are retarding volume, and 0.82 inches are recreation volume. The crest of the auxiliary spillway is established based on the runoff resulting from the 1-day and 10-day rainfall events. In the 1974 Work Plan, the rainfall for the 1-day and 10-day events is 6.75 and 11.30 inches. The top of the dam elevation is set by routing the probable maximum precipitation (PMP) event through the structure while preventing overtopping of the dam. During this PMP event, a significant amount of water will be discharged through the auxiliary spillway. In the 1974 plan, the PMP was 26.26 inches of rain in a six hour period resulting in 22.14 inches of runoff. The maximum water surface elevation (top of dam elevation) was 1583.0; with the principal spillway crest elevation set at 1541.2 feet, the auxiliary spillway crest elevation set at 1571.0 feet and the auxiliary spillway bottom width of 400 feet.

The 2009 Second DEIS indicates the total capacity of the Lost River Site 16 structure to be 3.97 inches. This volume is to the auxiliary spillway crest elevation of 1560.3 feet. Of the 3.97 inches, 0.34 inches are sediment volume, 3.00 inches are retarding volume, and 0.63 inches are water supply volume. The crest of the auxiliary spillway is established based on the runoff resulting from the 1-day and 10-day rainfall events. Using updated rainfall data, the 2009 Second DEIS indicates the 1-day and 10-day rainfall amounts to be 6.8 and 9.2 inches. Since the more recent rainfall data is less than that for 1974, the crest elevation of the auxiliary spillway is lower. The top of dam elevation is set by routing the PMP storm through the structure while preventing overtopping of the dam. In the 2009 Second DEIS, the PMP is shown to be 27.60 inches in a six hour period resulting in 23.72 inches of runoff. The maximum water surface elevation (top of dam elevation) is 1574.4 feet; with the principal spillway crest elevation set at 1530.9, the auxiliary spillway crest elevation set at 1560.3 and the auxiliary spillway bottom width of 400 feet.

The main difference between the 1974 work plan and the 2009 Second DEIS storage volumes for Site 16 is the updated rainfall data. The updated rainfall data reduced the amount of runoff resulting from the 1-day and 10-day rainfall events, which in turn reduced the elevation of the auxiliary spillway elevation and the top of dam elevation. So, while the storage volumes at the auxiliary spillway have decreased from the 1974 plan to the 2009 Second DEIS, so has the rainfall event used to establish the auxiliary spillway crest elevation.

And where are the calculations to show the difference between how much rainfall a dry dam would hold as compared with a dam that is used for water supply and thus is full or nearly full of water?

Response: In the case of a dry dam or dam without a permanent pool, the volume of sediment would dictate the elevation of the principal spillway crest elevation instead of the volume of sediment and water supply used to establish the principal spillway crest elevation for the proposed Site 16 (See discussion of dry dams on Page 18 of the 2009 Second DEIS).

Isn't it a misnomer to call this a flood retarding dam when its main function will be as a reservoir for water supply?

Response: No. Impoundments of this nature can serve both water supply and flood water detention functions. Examples of NRCS structures serving both functions include the North Fork Hughes River impoundment in Ritchie County, Mill Creek Site 13 in Jackson County, Pocatatico Sites 14 and 28 in Roane and Jackson Counties, New Creek Site 14 in Grant County and Parker Hollow Site 10 in Hardy County.

Patrick Webster comments submitted by email May 25, 2009.

This version of the EIS seems to be nothing but an edited version of the EIS released in April 2007. The previous EIS was unacceptable because it was found to inadequately address all the factors impacting the environment of the watershed.

Response: Comment noted. See responses to comments 1 and 2 submitted by Stephanie Slater May 14, 2009.

Joem Webster comments submitted by email May 25, 2009.

- 1. This mess/farce began in 1961 and refuses to die. Despite all of the petitions and opposition since before any of the on the Lost River were built, the PVSCD and Hardy County Commissioners (backed by NRCS) just keep pushing on. They have totally ignored the public for over 40 years.**

We do not have a flooding problem on this side of the mountain. In 1985, we lost no power, people got up and went to work and Mathias received more rain fall than Moorefield. Water supply, for what? There is not enough water in Lost River to support anything and you can not manufacture water. People are moving out of Hardy County, not into Hardy County. There are houses for sale everywhere, a motel, a restaurant, a real estate company, a "mom & pop store", a bed and breakfast, just to name a few. Everyone from Arkansaw to Mathias has a well and septic system, they simply can not afford more monthly bills. My husband and I are 100% disabled and we can barely pay are monthly bills along with doctors and medications now. The fact still remains that Lost River is more of a creek, there is just not enough water to support public water and the majority does not want it or need it. Hardy County is one of the two driest counties in West Virginia.

There is no back up in the EIS that shows figures that add up for the need of either flood control or water supply. We already have enough recreation, trout pond, Lost River State Park, etc. There is still no traffic on Corridor H. The vehicles that do go through are heading to ski resorts, smoke hole caverns or Seneca rocks. Those are the tourist attractions, we have nothing here.

Response: Comments noted.

- 2. Why did NRCS not examine other potential sites instead of relying on sites selected on the basis of an EIS prepared 35 years ago?**

Response: See previous response to Ann Webster comment 8, submitted May 22, 2009.

- 3. If the No Action Alternative is “the alternative with the greatest net benefits” (page 86), why is that not the Recommended Alternative?**

Response: See previous response to comment 2 for Elizabeth Webster email May 27, 2009.

- 4. Many citizens will not send in comments (although they would like to because they are also against the Dam Site #16) but they won't because they have signed petitions before and were visited by the NRCS reps and in so many words were threatened that if they went against the Dam or signed anything else “their loans could suddenly come due or they might not receive any more grant money”. Great Government we have, isn't it?**

Response: The Natural Resources Conservation Service strongly encourages and supports public comment in accordance with the National Environmental Policy Act and U.S. Department of Agriculture regulations. Claims of employee impropriety may be reported to the West Virginia State Conservationist (Kevin Wickey 304-284-7545) or the USDA Office of Inspector General (1-800-424-9121).

Patrick Webster comments submitted by email May 25, 2009.

- 1. Does the estimated cost of the project include costs associated with land acquisition and the removal of homes and other facilities, road and utility relocations, rights-of-way for the water distribution system and power supplies, construction and operation (including maintenance) of the water treatment facility and water distribution system, and the incidental recreation facilities? If not, what are those costs and what is the source of funding?**

Response: The estimated cost of the Site 16 impoundment project includes land acquisition, removal of homes and buildings, road and utility relocations, and incidental recreation facilities. Rights-of-way for the water distribution system, power supplies, construction and operation (including maintenance) of the water treatment facility and water distribution system are included in the cost estimates prepared for the Hardy County Public Service District by Thrasher

Engineering. The costs of the Baker/Mathias water treatment and distribution project are discussed on pages 70-71 of the Second Draft EIS.

- 2. Does NRCS intend to interrupt the cycle of alluvial soil movement in the entire watershed? That would be the only way to control all soil erosion.**

Response: No.

Todd Cianfrocca comments submitted by email May 26, 2009.

- 1. I am writing to voice my strong opposition to the Potomac Valley Conservation District's Lower Cove dam project in the Lost River Valley of Hardy County. As a native West Virginian and local Hardy County landowner, this area is dear to my heart as I have hunted and fished in the Lower Cove area for the past 40 years.**

The environment that will be impacted by this project is currently home to many fragile species, not to mention 12 families whose land has been passed down from generation to generation. The Lower Cove stream that the Lost River Subwatershed project affects is a natural brook trout reproducing stream as documented by a recent biological study. Any structure, specifically a dam, risks forever damaging this delicate trout population enjoyed by thousands of sportsman throughout the last century.

Response: Comments noted.

- 2. Please consider these additional points when reviewing the PVC District's application:**

- Sections of the Lower Cove stream are considered Tier 3 stream segments as they run through the George Washington National Forest.**

Response: Correct. Portions of Lower Cove Run that are "high quality waters or naturally reproducing trout streams located within the boundaries of National forests Bounded on both sides of the water by public land, will be designated Tier 3 waters."

- Approximately 30+ acres of natural, aquatic life inhabited wetlands will be destroyed.**

Response: According to the wetland delineation report (Appendix D), 26.65 acres of wetlands were identified within the proposed Site 16 project area. Of this total, it is expected that about 16 acres of wetlands will be adversely impacted by the project. Nearly all of these wetlands are of marginal and poor functionality. Mitigation for the impacts to these wetlands will include the enhancement of wetlands not impacted by the project installation and the creation of constructed wetlands within the project site and at locations off-site. These wetland mitigation measures will be implemented in accordance with the federal and West Virginia requirements.

- **The proposed dam would be considered “high hazard” with the capacity to cause loss of life to those below or downstream of the structure in the event of breach or failure.**

Response: Correct.

- **A federal complaint has been lodged and investigation is pending regarding whether USDA-NRCS complied with federal guidelines (NEPA) in moving this project along.**

Response: Comment noted.

- 3. My hope is that your office rejects this plan. The overwhelming majority of local residents and surrounding landowners who oppose this project are ultimately the ones who must live with the negative environmental impact this project will have.**

Response: Comments noted.

Stephanie Slater comments submitted by email May 25, 2009.

- 1. What is the status of the 401-certification? It was in the comment stage when the ROD was revoked. Does it have to be approved before land is acquired?**

Response: The application for 401 certification, submitted to the WV Department of Environmental Protection by the Potomac Valley Conservation District, is currently in-active. At such time as the EIS is finalized and a new record of decision may be issued, efforts to obtain the 401 certification will be resumed. NRCS is not aware of any restriction to sponsors acquiring land prior to receiving the 401 certification.

- 2. Why is there no benefit-cost analysis for just site 16? The analysis provided is for all four dams.**

Response: The project was authorized as a series of five upstream impoundments and is analyzed as such. Because this supplemental EIS eliminates one site, the benefit-cost analysis is for four sites. See first paragraph of response to comment 1 of EPA letter May 27, 2009.

- 3. Based on recent legislation, portions of the Lower Cove Run are considered Tier 3 segments. Has consideration been given to this? I do NOT see it mentioned in the second draft EIS.**

Response: See response to comment 3 submitted by Anne Webster May 22, 2009.

Lost River Committee comments submitted by Stephanie Slater by email May 25, 2009.

- 1. No Scoping Conducted.** NRCS seems focused only on completing the NEPA process quickly, rather than on preparing a document that fully addresses the environmental impacts of all components of the proposed action and all reasonable alternatives. If NRCS were concerned about meeting its NEPA responsibilities, it would have conducted a scoping process for the Second Draft EIS, which would have given other agencies and affected landowners an opportunity to explain what actions, alternatives, and impacts should be addressed in the document.

Response: The Second Draft EIS was issued in order to include information completed following the release of the Final EIS in 2007. NRCS is not required by NEPA to conduct additional scoping prior to the preparation of a Second Draft EIS because the nature and extent of the project remained the same as that presented in the previous draft document.

- 2. Purpose and Need.** The purpose and need for agency action is based entirely on the project sponsor's desires without any discussion of the public purpose and need and without any inquiry as to the validity of the sponsor's claims.

Moreover, there is inadequate explanation of the need for additional flood control or additional water supply. For example, although the EIS states that ten damaging floods have occurred since 1936 (page 5), the document does not describe or quantify the damages caused by each of these floods or show how the Site 16 dam and impoundment would reduce such damages in the future.

To the extent any information is provided, the EIS states that “[f]lood damages for agricultural properties, transportation infrastructure, businesses, utilities, and public and private property were initially established via personal interviews” (Appendix C, page C-5). Basing the need for flood control on personal interviews regarding flood damages is unsound and renders the analysis inadequate.

In addition, residential and commercial water supply needs were projected through the Year 2060. Projecting such needs more than 50 years into the future is speculative at best.

Finally, the EIS does not address the inherent conflict between flood control (allowing excess water to pass downstream in a controlled manner) and water supply (retaining water in an impoundment to provide water in the event of a drought). How one project can provide both flood control and water supply is not explained.

Response: Comments noted.

- 3. Connected Actions.** The description of the proposed action does not include all components of the proposal such as construction or operation of the proposed dam and impoundment and the water treatment facility and water distribution system

a. Level of flood control sought to be achieved (e.g., 10-year flood, 100-year flood, or 500-year flood)

Response: The level of flood protection varies with ones location within the watershed. Each of the individual impoundments is designed to store flood water runoff from up to the 100-year storm. Tributary streams immediately below each impoundment would approach levels of protection from the 100-year storm. The level of protection decreases as one moves downstream to locations where tributaries without flood water detention contribute runoff to the watershed. Hydrology models can predict how much the peak flood elevations will be reduced at various locations with the impoundments in place; however, this reduction does not translate to a recurrence interval, e.g. flood frequency.

b. Dam/embankment height and width

Response: See Table 3

c. Size and location of construction site, including laydown areas

Response: See maps in Appendix B

d. Excavation of borrow material for dam construction

Response: See maps in Appendix B

e. Time needed for construction

Response: Present estimates are for construction of Site 16 to take approximately four years.

f. Number of workers needed for construction, including access roads and utilities

Response: It will be up to the contractor to determine how many workers will be required to complete the work within the specified time frames.

g. Type of construction equipment that would be used and for how long

Response: It will be up to the contractor to determine the amount and types of equipment needed to complete the work within the specified time frames.

h. Road and utility relocations required

Response: No public road relocation is anticipated to be necessary as a result of the installation of the Site 16 impoundment. A short segment of Lower Cove Run Road will be raised to a higher elevation following the existing alignment. No utility relocations at the Site 16 project location are anticipated at this time. In the event that utility relocations are necessary, they will be moved prior to initiating construction at the site.

i. Location and distance of access roads, including roads and boat ramps/docks for recreational fishing and boating access

Response: Details specific for the location and length of access roads and the boat launching area are not complete. It is anticipated that public access to the boat launch area will utilize access roads currently serving as private driveways or access roads used for construction access by project contractors. Public access will likely be to the upper end of the permanent reservoir from Lower Cove Road.

j. Location and size of parking areas

Response: The location and size of parking areas has not yet been determined.

k. Location and distance of utility rights-of-ways, such as for electric transmission lines and water distribution pipelines

Response: The location and length of proposed water transmission lines are shown on maps in Appendix B and discussed on pages 70 and 71 in the 2009 Second DEIS. The location and length of electric line rights-of-ways necessary to provide power to water treatment facilities, pumping stations or other water system appurtenances are not known by NRCS.

l. Location and number of streams and other sensitive areas (including private property) that may need to be crossed for the construction of utilities and roads, and how they would be crossed Location and cost of the water treatment facility that would be needed to treat the stored water

Response: One or more stream crossings will be necessary on Lower Cove Run to accommodate construction of the Site 16 dam. These crossings will be within the Site 16 project area and will not cross privately owned property. NRCS is not aware of the number and locations of stream crossings, access roads or utility rights-of-ways that might be associated with the water treatment and water distribution facilities.

m. Construction of the water treatment facility, including time needed, number of workers, and type of construction equipment that would be used and for how long

Response: The water treatment plant and water distribution system proposed by the Hardy County PSD is not a connected action to NRCS constructing the Site 16 impoundment, including 400 acre-feet of rural raw water supply. Because NRCS is not involved with these projects, it can not specify how many workers, what types of construction equipment or the length of time that will be required to complete these projects.

n. Chemicals that would be used in the operation of the water treatment plan and planned storage of those chemicals

Response: NRCS will not design or oversee construction of a water treatment facility for the Lost River watershed. As a result, NRCS has no knowledge of what kinds of chemicals may be used in the water treatment processes or the storage requirements for any such chemicals.

o. Construction, operation, and maintenance – and the associated costs – of the water distribution system that will be required to move the water from the impoundment to water users

Response: NRCS will not design or oversee construction of any water distribution system for the Lost River watershed. As a result, NRCS has no knowledge of the operation and maintenance costs associated with the proposed water distribution system. Estimated costs of installing the various Phases of the water distribution system are discussed in the Second DEIS, pages 70 and 71.

p. Because improvements such as homes, barns, and sheds would not be allowed in them, the location of downstream “flowage easements” that would be required

Response: The only flowage easements associated with this proposed action is the approximately 40 acre flowage easement downstream of the Site 16 auxiliary spillway outlet. This easement is disclosed in the 2009 Second DEIS.

q. Operation and management of the impoundment for both flood control and water supply under normal and drought conditions, such as provision of minimum instream flows for the protection of downstream fisheries and riparian resources

Response: Under normal conditions, operation and management of the impoundment by an operator is not required. The riser structure controls the amount of water discharged from the impoundment. During extreme drought conditions, when there is no discharge through the principal spillway, the cold water release gate may be adjusted to supplement flows downstream.

r. Maintenance [f]or the project over its expected 100-year lifetime

Response: Operation and maintenance for the Site 16 dam, principal spillway, auxiliary spillway and impoundment will be the responsibility of the local sponsoring organizations.

The EIS is inadequate because it does not to fully describe all components of the proposed action, including the water treatment facility and water distribution system, as connected actions or analyze the impacts of those components.

Response: The water treatment plant and the distribution system are not connected actions dependent upon the installation of additional water supply at Lower Cove Run.

4. Alternatives. The EIS does not evaluate all reasonable alternatives. Only alternatives that meet both flood control and water supply needs are considered, but there is no explanation as to why both purposes must be met by one project. Thus, alternatives that would allow for flood control but not water supply and alternatives that would allow for water supply but not flood control were not considered.

Further, NRCS did not consider alternatives in which one or more actions could be undertaken for flood control and another action or actions undertaken for water supply, thus resulting in both objectives being met with perhaps fewer adverse environmental impacts. For example, stream bank restoration, riparian planting, and runoff management together might provide sufficient flood control; groundwater sources and water conservation measures might provide sufficient water supply to meet future needs.

Response: Alternatives considered for flood control and for water supply are discussed in the 2009 Second DEIS on pages 12 through 24. NRCS evaluated these alternatives in sufficient detail to determine if they reasonable alternatives to address the stated project purposes. Alternatives that require more acres of land to be acquired, impacted greater amounts of resources of concern (e.g., prime lands, riparian habitats, etc.) or failed to adequately address

project purposes were determined to be not reasonable. NEPA does not require that every possible combination of alternatives be analyzed.

Finally, NRCS does not examine other sites in the region that might provide flood control and/or water supply needs, but rather limits itself to consideration of only those sites that were examined in the original EIS prepared 35 years ago.

Response: See response to comment 7 submitted by Patrick Webster at the May 14, 2009 public workshop.

NRCS should initiate a scoping process with all interested parties to determine the range of alternatives that should be addressed in the EIS, analyze the impacts of those alternatives, and reissue a Third Draft EIS for comment.

Response: See response to comment 1 of the Lost River Committee comments submitted by Stephanie Slater by email May 25, 2009.

5. Environmental Consequences. The analysis of environmental impacts is incomplete because it relies on a 1974 EIS that has not been updated, does not address all of the impacts of the proposed action, and does not address socioeconomic impacts.

Response: The 1974 EIS has been supplemented four times specifically for the purpose of updating and adding relevant information.

As noted above, NRCS did not fully describe all aspects of the proposed action. As a result, NRCS also failed to fully describe all of the environmental impacts associated with all components of the proposed action, including the water treatment facility and water distribution system that would need to be constructed and operated to treat and distribute the new water supply created by the proposed project. In addition, there are several potential impacts that were not addressed in the EIS:

a. Impacts to air quality from the construction of the project, including the water treatment facility and water distribution system.

Response: Reference is made to Tabulation 1 on Page 10 of the Second DEIS. The project area is not in an air quality non-attainment area and air quality was not determined to be a resource concern relevant to this project. Impacts to air quality resulting from the construction of Site 16 will be temporary and will consist largely of dust and exhaust emissions from construction equipment. These impacts to air quality will be minimized during construction to the extent practicable. Upon completion of construction, air quality will return to ambient conditions.

b. Impacts on downstream fisheries and riparian areas. The EIS describes the results of an evaluation of fishery resources for Lower Cove Run (page 44), but does not state what the impacts of the proposed dam/embankment would have on those resources. Similarly, the 2009 Second Draft EIS states that 3,040 linear feet of Lower Cove Run would be displaced by the dam and

Response: Additional discussion of the impacts to Lower Cove Run downstream of the dam appears in the 2009 Second DEIS Mitigation Summary, pages 102-103 and 107-109. Riparian areas along the Lower Cove Run below the dam and on Lost River are not expected to be adversely impacted. See response to comment 9 EPA letter May 27, 2009.

- c. Threatened and endangered species. The EIS states that the U.S. Fish and Wildlife Service was last consulted in 2005 regarding the potential impacts to threatened and endangered species. Because new information could have been developed in the last four years, NRCS should initiate consultations again and document those consultations in the EIS.**

Response: The 2009 Second DEIS was submitted to the U.S. Fish and Wildlife Service for their review. Any concerns that may have resulted from new information regarding Threatened and Endangered Species specific to the proposed Site 16 impoundment would have been submitted to NRCS by this agency during the review and response period. The letter dated May 26, 2009 that was submitted by the U.S. Department of the Interior, for which the U.S. Fish and Wildlife Service is included, did not offer any comments pertaining to this proposed project.

- d. Land use impacts. There is no discussion as to the number of residences and structures that would be displaced by the proposed action and all related actions. In addition, the EIS should address the extent of the personal significance of the affected properties to the property owners, and not simply tally the number of residences. The EIS should include photographs of all of the homes and other buildings that will be removed as a result of the proposed action to provide decisionmaker(s) with a complete and accurate description of the adverse consequences of the proposal.**

Response: The amount of property required for implementation of the proposed Site 16 project is discussed in the Real Property Rights section on Pages 115-116 of the 2009 DEIS. This discussion includes disclosure of the number of residences that will need to be relocated in order for the project to be installed.

- e. Public health and safety. Although the EIS Appendix B contains maps that purport to show the “inundation boundary resulting from a sudden and total breach of the dam,” there is no discussion of the potential impacts of such an event.**

Response: A breach analysis is performed as part of the Emergency Action Plan that is required for high-hazard dams in West Virginia. This Emergency Action Plan identifies areas that may be affected in the event of a dam failure. The breach analysis assumes that the reservoir is full to the top of the dam and that the embankment suffers a sudden and complete instantaneous failure. The result of this failure is depicted on the floodplain inundation maps in Appendix B. The inundation boundary is the area that would be flooded in the unlikely event of a sudden and total breach of the dam.

- f. Socioeconomic impacts. The EIS does not address impacts to housing, public services (such as schools), and the local tax base as a result of the**

Response: Housing and other infrastructure in the floodplain will experience reduced flood damages as a result of the construction of Site 16. These reductions are reflected in Tables 4 and 6 in the FEIS. The construction of Site 16 will result in temporary increases in the number of construction workers and in wages, with a resulting increase in expenditures in the local area. Operation and maintenance of the proposed Site 16 will have no impact on the local tax base. The water treatment facility and distribution system is a non-connected action, unrelated to the construction of Site 16. As such, impacts of this action were not addressed in this document.

- g. Indirect impacts. The EIS does not address the impacts of additional residential and industrial growth that would be induced and facilitated by access to increased water supply. Although the EIS states that the impoundment is needed to provide a water supply for future growth, building the additional water supply would actually cause future growth which would, in turn, cause adverse environmental and socioeconomic impacts in the area. These should be addressed in the EIS.**

Response: Growth and development is already occurring in the Lost River Watershed as shown by the data in the Water Supply Report (Appendix E). Urban sprawl from the Washington, DC metropolitan area, as well as new highway development, are the major factors influencing growth. The development of rural raw water supply is in response to this growth.

- h. Impacts, such as reduction in flood control benefits, of eliminating the construction of a dam at Site 23 are not addressed in the EIS.**

Response: Adjustments to the amount of flood damage reduction, including costs and benefits, that resulted from the elimination of Site 23 from the project plan have been included in the analyses throughout the Site 16 document.

- 6. Cost Analysis. The cost analysis is flawed. For example, NRCS used 100 years as the design life of the Site 16 project, the far end of the range of what NRCS states is how NRCS structures are “usually designed” (Appendix G, page 14). Further, the cost-benefit ratio appears to have been determined by comparing benefits of the entire project with the cost of the entire project (see Tables 4 and 6), perhaps masking a less desirable cost-benefit ratio for the Site 16 project alone. Taken together, NRCS seems to have tailored its cost-benefit analysis to reach a favorable balance in order to justify a decision to proceed.**

Response: The analyses of costs and benefits are done by comparing the costs and benefits of the entire project. This process of cost-benefit analysis on a watershed scale is the appropriate level of analysis and was performed in accordance with NRCS planning policy.

Conversion of Prime Farmland and Wetlands. Implementation of the proposed action would require the conversion of approximately 28 acres of prime farmland and 16 acres of wetlands (pages 39 and 53). This would violate NRCS' NEPA regulations that establish as agency policy "the retention of important farmlands and forestlands, prime rangeland, wetlands, or other lands designated by State or local governments." (7 CFR & 650.3((b)(9)). The regulations also state that:

"Whenever proposed conversions are caused or encouraged by actions or programs of a Federal agency, licensed by or require approval by a Federal agency, or are inconsistent with local or State government plans, provisions are to be sought to insure that such lands are not irreversibly converted to other uses unless other national interests override the importance of preservation or otherwise outweigh the environmental benefits derived from their protection. In addition, the preservation of farmland in general provides the benefits of open space, protection of scenery, wildlife habitat, and in some cases, recreation opportunities and controls on urban sprawl." Id. (emphasis added).

The EIS does not address any national interests that could be said to override the importance of preservation or otherwise outweigh the environmental benefits derived from the protection of the prime farmlands and wetlands.

Response: The NRCS recognizes NEPA as the national charter for protection, restoration, and enhancement of the human environment (7 CFR Part 650.1). As such, the effects of a federal action upon environmental resources are analyzed to determine the adverse effects and benefits to the resources of concern, including humans. The NRCS mission is to provide assistance that will allow use and management of ecological, cultural, natural, physical, social, and economic resources by striving for a balance between use, management, conservation and preservation of the Nation's natural resource base (7 CFR Part 650.3(a)). The conversion of approximately 224 acres of private land to public uses for flood reduction and water supply, with incidental recreational benefits, addresses the need to protect and enhance the human environment. The proposed federal action meets the NRCS regulation to strive for this "...balance between use, management, conservation and preservation of the Nation's natural resource base."

7. Environmental Justice. The EIS addresses potential impacts to "tribal or minority populations," but not to low-income populations. NRCS is required to address whether the proposed action or alternatives could have "disproportionately high and adverse human health or environmental impacts to minority and low-income populations." Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations," February 16, 1994.

Response: Executive Order No. 12898 was created to prevent minority and/or low-income populations from being targeted for development projects. For example a new highway could not be located through a minority or low-income neighborhood in order to avoid an upscale, white-collar community. Sites for impoundments, including the Lower Cove Run site, are

selected based upon topographical and geological criteria that make them physically suitable for such a project. Minority status of residents or the level of income of effected property owners was not a consideration for selecting locations for impoundments in the Lost River Subwatershed.

- 8. Climate Change. The EIS states that the project life is 100 years (page 3). Given that very long time period, NRCS is required to address the extent to which changes in the region's climate – such as increases in the number of droughts or increases in severe storms that could result in flooding - may increase or decrease the need for flood control and/or additional water supplies. NRCS is also required to address whether the project would result in the emission of greenhouse gases which have been shown to be causing climate change.**

Response: NRCS evaluates the resources of concern that are raised during the scoping process. Climate change was not one of those concerns. Furthermore, the statistical modeling of flooding predicts future events based on past rainfall patterns in the area.

- 9. Cumulative Impacts. The EIS does not analyze the impacts of past, present, and reasonably foreseeable future actions in the region. The section entitled “Cumulative Impacts” simply identifies certain other actions that are being taken in the area and adds up the number of acres of land and perennial streams affected as a result of these other actions and the Site 16 project (page 78, Tabulation 4). There is no analysis of the overall impact that can be expected if the individual impacts are allowed to accumulate.**

Response: The document includes this information in the Cumulative Impacts section pages 68 - 83.

Further, the EIS states, without any basis, that because the percentages of various types of land that would be adversely affected by the proposed action and other actions that are being taken in the area are small, they are not considered “a cumulatively significant impact” (pages 79-82). The EIS does not indicate what percentage loss would be required to reach a “significant” level or why even a numerically small percentage is not cumulatively significant.

Response: The basis for the statement is contained within the text of the EIS. It is the professional opinion of NRCS that the total and percentage losses for resources discussed in the cumulative effects section are minor and not significant.

- 10. Other Permits Required. NRCS did NOT involve the Army Corps of Engineers (Army Corps) in the development of the 2009 EIS, despite the fact that the proposed action cannot go forward without an Army Corps Clean Water Act Section 404 permit. NRCS should have asked the Army Corps to participate in the preparation of the EIS.**

Response: The Army Corps of Engineers has been invited to participate in the project on several occasions. In some instances, they declined to do so as in the case of the scoping process. However, they did participate in the wetland delineation and also participated in several conference calls and meetings regarding Site 16. NRCS is fully cognizant of the permit process and will assist the sponsors in submitting the appropriate information to the Army Corps of Engineers when necessary.

Additional Questions:

1. Why did NRCS revoke the July 2007 Record of Decision in 2009?

Response: See response to Stephanie Slater comment number 1 submitted at the May 14, 2009 workshop.

2. Specifically, what new information, new alternatives, and/or new analyses are contained in the 2009 Second Draft EIS that were not included in the 2007 Final EIS? Please provide a comparison of the two documents (e.g., a redline/strikeout version that would show all of the changes between the 2007 Final EIS and 2009 Second Draft EIS).

Response: See response to Stephanie Slater comment number 2 submitted at the May 14, 2009 workshop.

3. What are the sources of funding for this proposed project? If federal stimulus funds are expected to be used, by what date must construction start in order to qualify for the federal stimulus funds? What would constitute start of “construction”?

Response: See response to Stephanie Slater comment number 3 submitted at the May 14, 2009 workshop.

4. Why must the project meet both flood control and water supply needs?

Response: See response to Stephanie Slater comment number 4 submitted at the May 14, 2009 workshop.

5. There seems to be an inherent conflict between the stated flood control and water supply purposes of this project. For flood control, the impoundment would be kept low or even empty to be able to collect excess water in the event of a flood. For water supply, the impoundment would be kept high to be able to provide sufficient water. Why does the Draft EIS not address this inherent conflict or discuss how the project would be operated and managed to meet both flood control and water supply needs?

Response: There is no conflict in addressing flood control and rural water supply needs within the same impoundment. See response to comment 3 submitted by Elizabeth Webster by email May 27, 2009.

6. Why did NRCS not examine other potential sites instead of relying on sites selected on the basis of an EIS prepared 35 years ago?

Response: See response to Patrick Webster comment 7 provided at the May 14, 2009 public workshop.

7. Why does the Draft EIS not address the siting, construction, and operation of the water treatment facility and new water distribution system that would be required?

Response: The 2009 Second DEIS does not address this issue because it is not an action of NRCS and is beyond the scope of this EIS.

8. Would any federal permits be required for the water treatment facility?

Response: The water treatment facility is not part of this project. Discussion about permitting requirements for water treatment facilities is beyond the scope of this EIS.

9. Would a Special Use Permit from the U.S. Forest Service be required for the approximately 12 acres of Forest Service land that would be needed for the proposal? If so, to what extent was the U. S. Forest Service involved in the preparation of the 2009 Second Draft EIS?

Response: Yes, a special use permit has been obtained from the Forest Service. The Forest Service is a cooperating agency and has assisted NRCS in the development of this document by providing environmental resource data and comments.

10. Does the estimated cost of the project include costs associated with land acquisition and removal of homes and other facilities, road and utility relocations, rights-of way for the water distribution system and power supplies, construction and operation (including maintenance) of the water treatment facility and water distribution system, and the incidental recreation facilities? If not, what are those costs and what is the source of funding?

Response: The estimated costs include land acquisition, the removal of homes and other facilities, as well as road and utility relocations. Any infrastructure necessary to accommodate incidental recreation is included in the project costs. Costs associated with the treatment and transmission of water are not included. This is a separate activity and will be developed by the entity that ultimately funds the water treatment plant and transmission lines.

11. If the No Action Alternative is “the alternative with the greatest net benefits” (page 86), why is that not the Recommended Alternative?

Response: The No Action Alternative does not meet the stated purposes of the project for flood damage reduction and water supply.

12. What is the schedule for completion of the Final EIS and the issuance of a Record of Decision?

Response: The FEIS will be completed in the summer of 2009 and the Record of Decision will be issued following the public release of the FEIS.

Alan Gramprrie comments submitted by email May 27, 2009.

I'm writing to submit my comments in response to the second draft EIS concerning the construction of the site 16 dam in the Lower Cove Run portion of the Lost River watershed project. I am a new resident in the area and the co-owner of a 16 acre parcel across lower Cove Run Road from the water containment area behind the dam.

My comments are centered around the general issues involved in this project. Specifically I understand that the need and benefits of the project are projected to be: a. To alleviate the potential of flood damage and b. To provide water for projected future development needs, to be available in times of drought, and to improve water quality primarily with regard to eliminating sediments and E. coli bacteria. I understand the plan is to focus on the construction of a dam at site

16, while two other alternatives -- to halt the project after the construction of the three existing dams, or to modify the site 4 dam to add a water supply component to the existing flood control structure -- have been rejected.

- 1. My first comment concerns one prominent issue that emerged from the comments section in appendix G. Several comments from the individuals who commented on the first EIS reflected the point mentioned in the EPA letter dated 10/24/2006. All of these comments centered around whether data for the site 16 project should be considered separately from the data of the entire project. The response to these comments referred back to the response to the comment in the EPA letter which included the following: "the flood damage reduction benefits cited in this supplement are the result of the combined effects of site 4, 10, 16 and 27 and the land treatment measure. All four structures work together to provide the level of protection and reduction in flood damages described in this report and displayed in the tables."**

This response is inadequate for two reasons. First, it is not a response to the point made in the EPA letter. The point of the EPA letter was that the NRCS had failed to provide data specifically relating to this site 16 dam and that this failure was a shortcoming of the initial

EIS. Rather than provide the data requested, the NRCS response simply repeats the observation of the writer of the EPA letter in that there is no specific information for the site 16 dam and acknowledges that all of the data for the site 16 dam is lumped together with data from the other three dams in the project. This response does not provide the information requested.

Response: Tabulation 2 on pages 27-30 of the 2009 Second DEIS provides information specific to Site 16. This includes a summary of the environmental effects for Sites 4, 10 and 27 in the Existing Conditions column and the environmental effects attributed for Site 16 in the Alternative 1 column. Other portions of this tabulation have columns for Sites 4, 10 and 27 and for Sites 4, 10, 27 and 16. Information for Site 16 may be extracted by subtracting one column from the other. NRCS maintains that it is appropriate to combine the flood damage reduction benefits for the system of four small upstream impoundments. Each of these impoundments has capacity for temporary flood water detention and when working collectively, the peak flood elevations along the mainstem Lost River are reduced.

The second reason the NRCS response on this point is inadequate is that it is logically indefensible to consider all four dams as part of one system for the sake of a cost-benefit analysis. Ostensibly, "all four structures work together to provide the level of protection and reduction in flood damages described in this report ..." (NRCS's response to the EPA letter dated 10/24/06). The only inherent reason why the four dams would be required to be considered as a unit would be if they worked together as a system in the same sense that the individual systems within some machine, say an automobile engine, would all be equal required to work together in order to perform the fundamental purpose of the engine. In other words, the ignition system, the fuel system, the mechanical structures of piston in cylinders, and the air intake system are all required to perform individual functions in concert in order to achieve the fundamental purpose to convert the potential energy of gasoline and air into the kinetic energy that drives the wheels. Each of these subsystems performs a function unique unto itself not duplicated by the other subsystems. The failure of any individual subsystem results in the failure of the function of the entire engine.

This is not the case when looking at the four individual components of the Lost River watershed project. Each individual dam performs the identical function of the other dams in the system. Their effect is aggregate, increasing the magnitude but not the fundamental nature of their effect. Each individual damn can perform its function regardless of the function of the other dams. The effect of each damn can be quantified without reference to the functions of the other dams. The fact that this was not done in this EIS reflects more a choice, a preference, of those who prepared the report rather than any fundamental or inherent requirement imposed by this situation.

Response: NRCS respectfully disagrees with the commenter's assertion that a series of upstream impoundments should not be considered as a system.

2. In fact, some data was included in the tables which allows a general cost-benefit analysis which addresses the points made in the EPA letter and in the comments mentioned above. Using data contained in tables 3 and 4 I've been able to produce my own table which compares the cost and some of the benefits of the site 16 project in comparison to the cost and benefits of the three dams already built. My table appears below:

	Total for existing 3 dams	Site 16	Total	Site 16 % of whole
Floodwater retained	7,519 acre ft	1,902 acre ft	9,421 acre ft	20.2%
Sediment submerged	874 " "	212 " "	1,086 " "	19.5%
Cost (Total)	31,074,800	29,324,100	60,398,900*	48.5%

Water supply	400 acre ft	400 acre ft	800 acre ft	50.0%
Cost (Water Supply)	594,500	3,149,400	3,743,900	84.1%

*number is approximately \$5 million lower the total cost of the project given in table 6. The cost of the site 16 project was the same in both tables. The difference lies in the projected costs for the existing three dams.

As in this table seems to indicate, the flood control and water quality benefits of the site 16 dam represent approximately 20% of the impact of the total project while the cost of the site 16 dam represents 50% of the cost of the entire project. With reference to these two criteria, it appears that the cost-benefit ratio of the site 16 project is far below that of the other projects. Using the cost-benefit ratio of the project as a whole as an argument for this site 16 project in itself is grossly misleading. Since it only took me about an hour to compile this table from the data presented in the EIS, I'm wondering why this analysis could not have been provided in the response to so many of the comments in appendix G.

Response: The cost-benefit analysis contained in the NRCS document is accurate and fully compliant with standard watershed planning procedures. Furthermore, the commenter erroneously assumes a linear relationship between the floodwater retained and the flood damage reduction benefits afforded by Site 16.

- 3. My third comment refers to the portion of the table that deals with water supply. A cost-benefit analysis makes it clear that the cost for 400 acre feet of water behind the dam at site 16 will be six times higher than the cost of the 400 acre feet of water behind the existing dams.**

Of course I realize that the entire issue of water supply is not really that simple. Issues about whether or not a water supply as large as the one proposed is necessary, whether it should precede or follow residential or commercial development, or the accuracy of the data projecting growth are beyond me. But there are issues contained in the NRCS discussion of the reasons why the alternative of modifying the dam at site 4 was rejected. For the sake of efficiency, I will present the relevant portion of the EIS that deals with the site 4 water supply alternative and then enclose my comments inside parentheses.

Site 4 is located on Kimsey Run, a tributary of Lost River. The dam site is located approximately one-half (0.5) mile west of the community of Lost River. This single-purpose flood control impoundment has a drainage area of 32.41 square miles. With this site's drainage area, it has potential for incorporating a dedicated and dependable water supply. Given this potential, the NRCS conducted an analysis of the costs and associated engineering requirements to add 400 acre-feet of water supply to Site 4. The investigation revealed that the elevation of top of dam, auxiliary spillway crest, and intake riser crest would have to be increased. These modifications would require the acquisition of at least 44 acres of land rights (property acquired in fee, flowage easements or a combination). The permanent pool would be raised approximately 5.5 feet in elevation. The existence of residences, buildings, roads and utilities within this area were not determined in this analysis. (What portion of the 44 acres of land rights would be easement? What sort of fees are paid for these easements and what impact do they have on the owners use of the land? If the land is pastureland, can it continue to be used as pasture land? What is the cost of acquiring the right to use these 44 acres compared to the cost of adding the water supply function to this site 16 project? Since satellite and aerial photography exists of this area, why was the existence of residences, buildings, roads and utilities within the area not included in this EIS?)

Response: The analysis of Site 4 was conducted to the extent necessary to determine if this option was more cost-effective. The construction modifications (increasing the top of the dam, raising the crest of the auxiliary spillway, changing the riser) already exceeded the cost of adding the entire water supply component to Site 16. Thus, it would have been an unnecessary exercise to continue to tally additional costs for modifying Site 4 when it was already determined to be less cost-effective.

It is likely that Sponsors would have to use eminent domain to acquire additional land rights at Site 4. These land rights would need to be acquired from many of the same landowners that were impacted when Site 4 was built. (How many landowners are involved and in what way will they be impacted? Will they lose their homes? Will they lose

farmland? What percentage of the farmland that they own will they lose to this project? Will a large farm lose a few acres or will an owner lose their entire farm? How do these impacts compared to similar impacts of the site 16 dam project?)

Response: See response to previous question.

Construction modifications to Site 4 would require draining the lake for at least one construction season as the changes were made to the structure and appurtenances. There would be a loss of the established fishery for three to five years. (Raising the water level at site 4 by 5 feet will result in a larger, deeper body of water full of a more desirable variety of game fish. It may even allow the possibility of anglers keeping a small number of bass. Would a larger and more productive fish habitat be more attractive to anglers than an additional habitat stocked with a less desirable species of fish?)

Response: Raising the pool elevation at Kimsey Run to create a larger and deeper body of water does not equate to a more desirable variety of game fish. The fishery is established initially by stocking and is managed by the WVDNR in accordance with water quality conditions, water temperature regimes and the size and depth of the reservoir. Supplemental stocking occurs, if necessary, until a self-sustaining population is established. Species of fish selected for establishment in impoundments are typically those most suited to survive and reproduce in reservoir conditions. Most impoundments managed by WVDNR are stocked with largemouth bass, bluegills and channel catfish. Occasionally, other species such as crappies and muskellunges are included in larger impoundments. Trout stocking in impoundments generates much interest among anglers, especially during the late winter and spring seasons. Because these artificial trout fisheries are operated on a “put-and-take” basis, WVDNR generally does not stock trout in impoundments with surface areas larger than 50 acres. One reason for this is that trout have a larger area for which to disperse and the likelihood of anglers catching them decreases. The larger the impoundment, the smaller the percentage of trout stocked is caught by anglers. Very often, trout that are not caught succumb to mortality and do not hold over until the next season. For this reason, WVDNR has determined that stocking trout in the larger reservoirs is not cost effective.

Largemouth bass creel limits in many West Virginia impoundments are restricted or limited by WVDNR because of the popularity of this species among anglers. Survey data collected by WVDNR indicates that impoundments that have limits to the size or number of bass that may be kept by anglers have much greater numbers of larger sized bass than similar impoundments with less restrictive creel limits. It is not likely that increasing the size of the impoundment at Kimsey Run would result in less restrictive regulations regarding the number or size of bass that may be kept by anglers.

Channel Catfish are a common species managed by WVDNR in impoundments. According to the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, West Virginians spend 2.22 million angler-days annually fishing for catfish. This accounts for about 32 percent of the fishing effort and ranks third behind bass fishing (2.997 million annual angler-days) and trout (2.555 million annual angler-days). This species often requires supplemental

stocking because lake environments often do not contain habitat components conducive to successful channel catfish reproduction. The proposed Site 16 impoundment will be constructed with habitat enhancements that will be more conducive to channel catfish reproduction. A larger annual recruitment of juvenile channel catfish resulting from increased reproduction rates will allow for increased total numbers of this species in the reservoir and consequently a greater quantity of larger sized fish.

The costs associated with modifications to Site 4 would be approximately \$9,500,000. This amount does not include road and utility relocations or additional landrights. (How was this number derived? Are the numbers cited exclusively construction costs? Why does the amount not include road and utility relocations etc.? At this point, the \$9.5 million appears to have been pulled from thin air. I'm sure it wasn't, but this document offers no proof of that.)

Response: Yes, the modifications to Site 4 would result in \$9.5 million in construction costs alone. Road and utility relocations were not determined because the construction cost alone made this alternative less cost-effective than adding the water supply component to Site 16.

The modification of Site 4 would result in adverse environmental effects. These include raising the permanent pool over five feet in elevation and the temporary or permanent inundation of additional acreage. This modification would also eliminate an established public fishery for 3 to 5 years and require relocation of roads and utilities for a second time. Adverse social impacts will result from the potential use of eminent domain to acquire private property from landowners who were previously impacted by the original construction of Site 4. (Some of the details in this section are a bit repetitive and were addressed in previous comments. Nowhere is there a comparison to similar impacts within this site 16 area. What is the inherent harm in doing things for the second time? Note that this EIS is being done for the second time.)

Response: See responses to previous comments on this topic.

In addition, the cost of adding a water supply component to Site 4 exceeds the cost of including the water supply component at Site 16. The flood damage reduction benefits, incidental recreation, and other benefits afforded by Site 16 would not be achieved. (These appear to be the most substantive issues contained in this section. I will deal with them in full in a moment.)

For the reasons stated above, this alternative has been eliminated from further consideration. (Page 23 and 24 of the second draft of the EIS.)

There are some additional comments relating to the water supply comparison between modifying site 4 and building site 16.

1. The drainage area of the site 4 dam is 32.41 mi.². The drainage area of the proposed site 16 dam is 11.88 mi.². This suggests that the site 4 dam will be collecting rainwater from an area almost 3 times larger than the site 16 dam. It seems logical that this larger drainage basin will recharge much more quickly than the site 16 dam. I found no information in this EIS that addresses this point, which seems relevant when considering the cost-benefit ratio of the water supply function of two sites.

Response: A safe yield analysis was performed for the proposed Site 16 on Lower Cove Run. The safe yield determined that Site 16 has enough recharge to maintain the minimum required storage during drought periods. The cost associated with water supply for Lost River Site 4 at Kimsey Run would far exceed the cost of water supply at Site 16. The impoundment at Site 4 has the potential to support a larger water supply at a much higher cost.

2. The discussion of the site 4 water supply function limits consideration to improvement of the site to provide 400 acre-feet of water. Is there any inherent reason why this site for water supply could not provide more than 400 acre-feet of water for a cost similar to the \$9.5 million price tag? If you can raise the water level 5 feet, why can't you raise it 6 feet?

Response: Raising the pool elevation at Site 4 an additional foot will increase costs, and the associated environmental and social impacts, even more. A modification to include 400 acre-feet of water supply is not cost-effective and it will be even less cost effective to add additional water supply storage to this site.

3. The preparation of site 16 base in to be habitat for catfish suggests that the reservoir behind the site 16 dam will be warmer and slower moving water. This would appear to be more favorable habitat for the growth and proliferation of E. coli bacteria. I was not able to find where this point is discussed in this draft of the EIS. Discussion of E. coli appears limited to areas below the site 16 dam.

Response: Water contained in reservoirs is usually warmer and slower moving than the water in the streams feeding them. E. coli bacteria are found in the small intestines of warm blooded organisms. It thrives within the intestines of these animals where it aids with the digestion of food. E. coli is contained in manure and this bacterium is often used as an indicator for the presence of animal (including humans) feces in bodies of water. E. coli bacteria introduced to a body of water as a result of contamination from animal waste may persist for a period of time; however, it will not grow and proliferate outside of the warm intestinal environment.

4. As mentioned above, this draft of the EIS contains the assertion that: "In addition, the cost of adding a water supply component to site four exceeds the cost of including the water supply component at site 16. The flood damage reduction benefits, incidental recreation, and other benefits afforded by site 16 would not be achieved." This comment contains two assertions. First, that the cost of adding water supply component at site for exceeds the cost of including the water supply component at site 16. This is only true if you compare the cost of adding the component to an existing dam at site for to the cost of adding that component to a proposed dam at site 16.20 In other words, after you pay the \$26 million it costs to make a proposed dam at site 16 a reality, then the water supply component will

only cost and another \$3.3 million. If you compare the cost of adding the component to an existing dam at site for to the cost of the entire project at site 16, then you come to a far different conclusion.

Response: Comments noted.

This brings us to the second assertion: "the flood damage reduction benefits, incidental recreation, and other benefits afforded by site 16 would not be achieved." Those are the benefits which justify the other \$26 million of the site 16 cost. As was shown in my own table above, the cost-benefit ratio of these outcomes considered for site 16 alone fall far below the standard required to justify the project. In other words, once you have spent a large amount of money in a grossly inefficient way, then you can put a small benefit of water supply cost reduction on top. This is a dubious strategy.

Response: The methods of analysis used in the development of this EIS, including the cost-benefit analysis, are consistent with NRCS guidelines for watershed planning.

My final point regarding the comments section in appendix G. refers to the letter written by the Army Corps of Engineers. I'm including the relevant comment and response:

"Department of the Army, Corps of Engineers letter of October 18, 2006

Comment: "The Pittsburgh District has the following comments on the DEIS:

- 1. An individual Department of the Army permit is required for this work**
- 2. A detailed Alternatives Analysis and Avoidance and Minimization narrative commensurate with the impacts to wetlands and other Waters of the United States will be required with your application. The Alternatives Analysis in the DEIS does not meet 404(b)(1) guidelines**
- 3. Direct and Indirect, temporary and permanent downstream impacts must also be considered in your impact calculations.**
- 4. Water delivery structures may also require permitting from this office if they impact wetlands or other Waters of the United States.**

The Pittsburgh District cautions the project proponent from finalizing design plans and issuing the Final EIS prior to receipt of a Section 404 Clean Water Act Permit as the design may be altered during the application review process."

Response (2006 First DEIS): It is NRCS procedure to complete the planning process and produce a Final EIS before applying for a project permit. NRCS acknowledges that

permits are required prior to the implementation of the proposed project. Comments 2 through 5 will be addressed during the permitting process.

My concern here is in the NRCS response to the letter's points. The Army Corps of Engineers states in its second and third points that the documentation in the EIS is inadequate. The NRCS response states that some "Final EIS" will be prepared for the application process. This suggests that this draft of the EIS will not be the final draft and that the draft submitted for permit approval will contain information that this draft does not. I am assuming that that final draft will be made available to the public at the time of its submission and that one more opportunity for public comment will be afforded before permits are issued. Am I wrong in this?

Response: Contrary to the above cited response to comments provided by the Corps of Engineers following release of the First Draft EIS in 2006, additional information has been included in the 2009 Second DEIS. This additional information includes a detailed wetlands delineation for the Lower Cove Run project site, completed archaeological investigations, additional discussion of the cumulative effects of projects in Hardy County, additional information pertaining to new housing, additional information pertaining to the proposed water treatment and distribution system (even though this component is not an NRCS responsibility), and a proposed compensatory mitigation plan. This additional information should address any remaining concerns raised by the Corps of Engineers in their comments to the First DEIS in 2006. You may observe that the Corps of Engineers did not submit any response to the request for comments pertaining to the 2009 Second DEIS.

In closing, I would like to note a disturbing consistency in what I would call "errors and omissions". These would include:

1. The merging of this site 16 cost-benefit analysis into the cost-benefit analysis of the entire Lost River project. The logic supporting this action is faulty at best.

Response: The cost-benefit analysis for the Lost River Watershed Project is correct.

2. The rejection of the modification of site [4]for to provide water should have been based on a comparison between site [4]for and site 16 on the basis of the criteria listed for the rejection of site [4]for. The logical need is to make a comparison between the two alternatives, yet the discussion focused exclusively on site [4]for. Further, the discussion of site [4]for was heavy on conclusion and very light on supporting detail, leaving the reader in a position of having to accept the NCRS conclusion without having any idea how that conclusion was actually reached.

Response: The cost-benefit analysis for the Lost River Watershed Project is correct. The costs to modify Site 4 exceed the costs of adding water supply to Site 16.

3. The discussion of water quality dealing with water temperature and with the E. coli seems focused exclusively on the impact of the site 16 project on the water downstream of

the dam. I was unable to find discussion of these points on the water contained within the impoundment behind the dam.

Response: See response to Alan Gramprrie's first comment 3.

4. There was no discussion among the alternatives considered of the possibility of addressing the water supply issue incrementally as the population and resulting demand increased.

Response: Water treatment and distribution is planned in phases which is in keeping with the commenter's concept of an incremental approach. However, as was shown with the analysis of retrofitting Site 4, it is far more cost-effective to include a dedicated water supply source into an impoundment initially than to re-build an impoundment later on. Furthermore, as population and water demand increases, landrights will increase and there will be even more displacement of residents to accommodate infrastructure. Please refer to the Water Supply Report in Appendix E. Data shows that there are increases in population and water demand occurring right now. **My concern suggested by these four points and others is not just at this EIS is incomplete but that the pattern in the impact of these omissions and errors seems to lead exclusively toward the conclusion that the site 16 dam is the only possible alternative. If errors had been made on both sides of the issue, it would be reasonable to conclude that they are the result of an impartial process. However, the errors appear to all the made in a way that favors one side of the issue. This leads to a conclusion that impartiality was not part of the process.**

Response: Comment noted.

RECOMMENDED ALTERNATIVE

Refer to the 1974 Work Plan – FEIS and Supplements 1, 2, and 3 for information on the setting and construction specifics for Site 4, Site 27, Site 10 and the land treatment component. The following information is specific for Site 16.

Setting

Site 16 is located in Hardy County on Lower Cove Run. Lower Cove Run is a tributary of Lost River and is regionally within the Potomac River Basin. The site is located approximately 0.5 mile southeast of the community of Lost City (Appendix B).

The site's physiography is valley and ridge with hilly topography. Ground surface elevations in the stream valley range from 1495 to 1520 feet Average Mean Sea Level (AMSL) at the dam site. Elevations of the surrounding hilltops range from 1640 to 2120 feet AMSL. The valley bottom at the dam site is approximately 1,334 feet wide. Hill slopes are moderately steep.

Planned Action

The planned action consists of completing Alternative 1 by constructing Site 16. Site 16 will consist of a compacted earth and rock fill embankment, encompassing a volume of 1,338,000 cubic yards. Fill will be obtained from the excavation of the auxiliary spillway, as well as other sources on site. Borrow areas providing a source of clay soils, necessary to limit water seepage through the dam, will be obtained from the permanent and flood pool areas, along both abutments, and in the auxiliary spillway (see borrow map, Appendix B). A cutoff trench will extend into the foundation, and a drainage system will collect seepage.

The principal spillway is planned as a drop inlet structure consisting of a reinforced concrete riser, a reinforced concrete pipe, and a reinforced concrete impact basin to dissipate energy at the outlet end of the pipe. The auxiliary spillway will be 400 feet wide and shall be located in the left abutment. Approximately 43.6 acres of flowage easements will be needed in the event of flow through the auxiliary spillway. The surface area of the permanent pool will be 46.6 acres, the surface area of the flood pool at the crest elevation of the auxiliary spillway will be 86.8 acres, and the surface area of the pool at the top of dam elevation will be 97.4 acres. The volume of sediment storage allocation is 229 acre-feet.

Construction will be performed using best management practices, so as to minimize erosion and prevent pollution. Soil disturbance will be kept to a minimum. Disturbed areas will be seeded, limed, fertilized, and mulched immediately after work has been completed.

Temporary bridges or other structures will be used when frequent crossing of streams is required. Diversion channels and sediment basins will be constructed, as necessary, to control sediment discharge from the project area.

Clearing will take place in areas of the permanent pool, dam foundation, auxiliary spillway, and borrow areas. All trees in the permanent pool area will be removed to minimize long-term operation and maintenance costs to sponsors and to minimize adverse impacts to the riser.

The 46.6 acre permanent pool is designed to include 400 acre-feet of water supply storage, which will be accessed via a water supply pipe, mounted to the riser and extended downstream of the structure.

The permanent pool will be available for incidental public recreation, including fishing and electric or non-motorized boating. About 234.4 acres, including the permanent pool and adjacent land, will be placed in public ownership (11.9 acres is already in public ownership with the US Forest Service). The land will be owned by the West Virginia State Conservation Committee according to State Code. The site will be maintained by the Sponsors with the Potomac Valley Conservation District (PVCD) in the lead role. The fishery resources will be managed by the WVDNR including angler access, stocking, and law enforcement. Three occupied houses and associated outbuildings and utilities in the flood pool will need to be relocated to accommodate the project.

MITIGATION SUMMARY

Implementation of the Lost River Subwatershed Dam Site 16 on Lower Cove Run will result in the unavoidable impacts to aquatic and terrestrial resources within the 234.4 acre project location. Most of these impacts will result from the construction of the embankment (dam), auxiliary spillway and the creation of the 46.6 acre permanent reservoir pool. Mitigation measures have been developed in consultation with biologists with the WVDNR. Areas of resource impact and proposed mitigation measures are as follows:

WETLAND IMPACTS

As indicated in the environmental consequences section and the Wetlands Delineation Report (Appendix D), 16.02 acres of delineated wetlands (Center of Area 1, Area 5 and Area 6) will be disturbed by project construction or converted to other uses. These impacted wetlands have low functional value and are used for agriculture including crop production (corn), hay production and pasture. These wetlands have surface drainage and the vegetative composition has been altered as a result of tillage and livestock grazing. An additional 9.63 acres of wetlands will be avoided. The avoided wetlands are partially emergent (west and east ends of Area 1) with forested and scrub-shrub components (Areas 2, 3, 4, 7 and 8) that have a somewhat higher functional value.

LOWER COVE RUN (STREAM) IMPACTS

A total of 6,100 linear feet of Lower Cove Run lies within the 234.4 acre project area. The placement of fill to construct the dam will cause 570 linear feet of Lower Cove Run to be eliminated. The 46.6 acre impoundment will permanently inundate 2290 linear feet of Lower Cove Run. An additional 180 feet of Lower Cove Run will be abandoned and replaced by an equal length of rock lined outlet channel below the impact basin. A length of 825 feet of Lower Cove Run lies between the outlet channel and the lower-most project boundary. This 825 linear feet of stream will not be directly impacted by project construction, but will no longer be subjected to flood flows above the design discharge of the riser structure. Discharges to this stream reach will no longer contain small gravel or larger sediment. Upstream, about 450 linear

feet of channel will be subjected to periodic, temporary inundation due to floodwater detention. Approximately 975 feet of Lower Cove Run will be infrequently inundated as a result of floodwater detention. The upper-most 810 feet of the stream will be above the flood water detention pool and will not be adversely impacted by the Site 16 project.

Other small tributaries, ditches or drainage swales within the Lower Cove Run project area were included within the delineated wetland areas or were determined to be non-jurisdictional.

A fishery survey was conducted on Lower Cove Run within the Site 16 project area on April 25, 2005 (Appendix D). This survey revealed seven species of fish comprised of 985 individuals. The total weight for this sample was 3.004 Kg. Three young-of-the-year brook trout, averaging one gram each, were obtained during this survey. No other trout or game fish species were observed during this evaluation.

The entire 6,100 linear feet of Lower Cove Run within the project area was evaluated in October 2007 using the EPA's Rapid Bioassessment Protocols (Barbour, et al. 1999). The stream was divided into reaches based upon channel dimension, pattern and profile, substrate composition and other physical characteristics. The following tabulation displays the RBP Habitat scores, habitat deficiencies, project effects and prospective mitigation.

Tabulation 6. Lower Cove Run stream reaches, RBP scores and project affects.

	Reach 1	Reach 2	Reach 3	Reach 4
REACH LENGTH (FT)	1785	1375	1140	1800
RBP HABITAT SCORES	181	171	139	133
HABITAT DEFICIENCIES	Width and composition of riparian zone vegetation on right bank is suboptimal.	Stream substrate is 25-50% imbedded. Erosion along 5-30% of right bank. Riparian zone vegetation along right bank is suboptimal.	Deep pools rare or absent. Channel nearly straight, low sinuosity. Right bank moderately unstable, 30-60% eroded. Riparian vegetation on right bank marginal.	Velocity and depth regime marginal, mostly shallow. Sediment deposition evident 30-50% of stream bottom. Riffles dominant geomorphic feature. 5-30% of banks with erosion. Right bank riparian vegetation impaired by grazing.
PROJECT EFFECTS	Upper 810' feet (ASW to TOD) no impact. Lower 975' subject to infrequent inundation in flood storage pool.	Upper 450' subject to periodic inundation by flood pool. Lower 925' of stream eliminated, permanently inundated by permanent pool.	Entire 1140' reach eliminated, permanently inundated by permanent pool.	225' eliminated, permanently inundated by permanent pool. 570' feet eliminated by dam and PSW. 180' of channel replaced with a PSW outlet channel. Lower 825' not altered by construction, subject to elimination of large sediment.
MITIGATION MEASURES	Improve riparian vegetation along right bank.	Improve riparian vegetation along right bank. Lower 925' of stream habitat eliminated.	Stream habitat eliminated on entire 1140' reach.	Upper 795' of stream habitat eliminated by PP and dam. 180' of channel replaced with a constructed outlet channel. Lower 825' receive grade control to prevent down-cutting. Improve riffle-pool ratio to diversify velocity and depth regime. Add boulder clusters and woody debris to provide cover.

TERRESTRIAL HABITAT IMPACTS

The project area is comprised of 41.2 acres of hayland/cropland, 107.4 acres of pastureland, 81.0 acres of woodland and 1.8 acres of farmstead (homes and lawns). See Land Use Map – Appendix B. The embankment footprint will impact about 16.97 acres comprised of 7.7 acres of hayland/cropland, 3.4 acres of pasture and 5.7 acres of woodland. When complete, the embankment will be revegetated with herbaceous species and mowed periodically to minimize the establishment of woody species.

The auxiliary spillway will involve an area about 23.4 acres in size south of the embankment. The spillway area is comprised of 19.8 acres of pasture and 3.6 acres of woodland. The auxiliary spillway will be revegetated with herbaceous species and will be mowed periodically to control woody vegetation. Earth and rock material excavated from the auxiliary spillway will be utilized for constructing the embankment.

The 46.6 acre impoundment created by the embankment will permanently inundate 13.9 acres of hayland/cropland, 11.0 acres of pasture and 19.27 acres of woodland. The remaining acreage (about 145 acres) will be subject to temporary inundation as the result of flood water detention, temporarily disturbed and reclaimed in conjunction with construction activities or avoided to minimize impacts to habitat. In any event, this 145 acre area will largely serve as a buffer area around the lake and embankment, provide for public access around the impoundment and provide space for the habitat retention and the installation of mitigation measures. A small area below the dam, of about two acres more or less, will be set aside and made available for the potential future site of a prospective Hardy County PSD water treatment facility.

WETLAND MITIGATION MEASURES (PROPOSED)

Mitigation for wetland impacts are proposed to be implemented on the Dam Site 16 project area to the extent possible (See Wetland Map, Appendix B). Wetland area 7 (except for 0.01 acre to be inundated), area 8 and the northeast portion of area 1 that is forested, will be avoided. About 2.75 acres of area 1 (eastern end) above the permanent pool elevation is proposed to be enhanced by interrupting drainage patterns, varying the topography and increasing the woody composition of the vegetation either through natural succession or with supplemental plantings. An additional portion of wetland area 1, about 4.5 acres, lies below the dam. This area will be avoided, if possible and enhanced from an emergent wetland type to a scrub-shrub wetland type. If this area cannot be avoided, it will be reclaimed as wetland to compensate for temporary impacts or the area used for constructed wetlands.

Wetland areas 2, 3 and 4 (comprising about 0.26 acres) will be avoided. These areas are old stream channels or flood channels that have been abandoned. These areas will be enhanced by creating additional channel-like depressions and encouraging the establishment of woody vegetation.

It has been estimated that about 5 acres of the upper shallow pool will have a depth of 3 feet or less. It is proposed that at least a portion of this shallow area be isolated from the main body of the reservoir by creating berms or other features that would enhance vegetative diversity. The WVDNR considers any water over two feet in depth to be “open water” and of limited value as wetland mitigation. Additional areas just upstream of the pool area and within a few feet of the

permanent pool elevation may be enhanced by creating depressions and diversifying topography. This area has potential for acquiring wetland characteristics as a result of the elevated water table that will result from the creation of the reservoir.

Topsoil from wetland areas that will be subjected to construction impacts and that also has a predominance of native hydrophytic vegetation will be stockpiled and dispersed in the lake's shallow pool areas and in any mitigation wetlands devoid of hydrophytic species. Topsoil with atypical wetland vegetation will not be utilized in newly established or enhanced wetlands to avoid spreading non-native or potentially invasive species.

Additional opportunities to create wetlands exist on the area east (upstream) of the reservoir and lower flood storage pool. Sufficient space exists for the creation of constructed wetlands and vernal pools in this area. If additional wetland mitigation is required, project proponents will work with the US Forest Service and the state and federal resource agencies to identify suitable areas on nearby Forest Service lands where vernal pools may be constructed. In the event that all necessary wetland mitigation can not be incorporated within the Site 16 project area or on nearby Forest Service Lands, an opportunity exists to implement remaining wetland mitigation measures at the Edwards Run Wildlife Management Area in Hampshire County. This area is located just north of Capon Bridge, WV, and is presently in public ownership.

LOWER COVE RUN STREAM MITIGATION (PROPOSED)

A total of 3,040 linear feet of Lower Cove Run will be eliminated by the installation of Lost River Dam Site 16 (Table 1). Approximately 810 linear feet of Lower Cove Run lies within the

upper reach of the Run above the flood storage pool that will not be affected by the project.

Another 975 linear feet of Reach 1 will be subjected to infrequent inundation during flood water detention. The RBP process identified that vegetation in the Reach 1 riparian zone along the right bank (looking downstream) was suboptimal. Portions of the riparian area along the right bank are adjacent to a residence where open areas are maintained. This area along the right bank is proposed to be allowed to grow up to enhance the amount and quality of woody vegetation in this riparian area.

About 450 linear feet of Reach 2 will be subjected to periodic inundation during flood water detention and the lower 925 feet of the stream will be permanently inundated by the permanent pool. The RBP process identified habitat deficiencies for this reach as: suboptimal vegetation along the right bank riparian zone; streambank erosion along up to 30 percent of the right bank; and stream channel substrate being 25-50 percent embedded. It is proposed that riparian vegetation along the right bank be improved and that natural stream restoration measures be installed to address the eroding stream banks along the upper most 450 feet of Reach 2.

Reach 3 will be inundated by the permanent pool of the reservoir for the entire 1140 feet length of this portion of Lower Cove Run.

Reach 4 is the most degraded section of Lower Cove Run in the project area according to the RBP scores. This reach is characterized by a shallow, over-wide channel, up to 50 percent of the substrate is comprised of depositional sediment, up to 30 percent of the streambanks exhibit evidence of erosion and the riparian zone along the right bank is impaired by grazing. The upper

795 feet of the stream will be eliminated by the dam and permanent pool. Another 180 feet will be abandoned and replaced by an equal length of rock-lined outlet channel. The remaining 825 feet of stream between the outlet channel and the property limits will be available for installing enhancement measures. Grade control in the form a cross vanes will be installed to prevent channel down-cutting and to improve stream velocity and depth regime. Measures to address eroding streambanks will be installed. Woody riparian vegetation will be encouraged for streambank stability and shade.

Mitigation for the 3,040 linear feet of Lower Cove Run to be eliminated or permanently inundated by the project will be accomplished in part by measures proposed in the preceding paragraphs. Additional mitigation measures may be employed upstream of the Site 16 project. Sites within National Forest Lands will be particularly desirable for this purpose because they are already in public ownership. The total amount of mitigation to offset stream impacts on Lower Cove Run remains to be defined.

COLD WATER RELEASE AND MINIMUM FLOW

A provision for a low-flow/cold-water release in the outlet structure of the dam will be incorporated into the outlet works. This release will consist of a gate on the intake riser about 13.2 feet below the permanent pool elevation. This gate will allow for the release of cold reservoir water to minimize any increase in downstream water temperatures during summer and early fall that might result from the release of warmer surface water from the impoundment during these warm months. In addition, this release will allow for supplementing low flows downstream of the impoundment if seasonal conditions require such an action.

TERRESTRIAL HABITAT ENHANCEMENTS

Habitat within the 234.4 acre project site was evaluated using the Pennsylvania Modified Habitat Evaluation Procedure (PAM-HEP). Habitats within the project area were divided into compartments based upon vegetative similarities. Habitat suitability Index Models for species, including the fox squirrel, black-capped chickadee, eastern meadowlark, red fox, mink and channel catfish, were used to calculate Habitat Suitability Index scores for each habitat compartment. These scores were multiplied by the number of acres in each compartment and totaled to estimate habitat units within the project area. This process was applied to the project area existing conditions, project area with project installed and the installed project with mitigation applied.

Habitat for the existing conditions was calculated as 412.32 habitat units (HU). When the project conditions with the project installed was calculated, a value of 315.14 HUs was found. This difference of 97.18 HUs amounted to about a 24 percent decrease in HUs. Habitat value for channel catfish in the 46 acre reservoir was calculated to be 30.36 HUs. This brings the difference in habitat value to about 16 percent (66.82 HUs) of that of the existing conditions.

Woodland areas that will not be disturbed during construction will be left in their current state. Areas currently used for agriculture (crops, hay and pasture) that will not be disturbed during construction will be allowed to succeed through natural succession. This will include wetland areas that will be avoided and those that are subject to enhancement, including constructed wetlands for mitigation. A portion of the tree tops and brush cleared from construction areas will be windrowed along terrestrial field borders and as brush piles. Supplemental plantings, such as

pin oak, buttonbush and silky dogwood are also proposed for the upper reservoir area where they will provide a source of wildlife food.

Some of these areas provide habitat for migratory birds. Land use changes will result in a loss of habitat for some types of migratory birds, such as common songbirds. However, birds that utilize and feed upon open water, such as migratory waterfowl, bald eagles, and osprey, as well as those that depend upon shallow water habitats, such as shore and wading birds, will be benefited through the provision of additional habitat that is currently limited within the watershed. These benefits were not fully captured in the habitat evaluation procedures used.

RESERVOIR ENHANCEMENTS

Consultations with the WVDNR District Fishery Biologist during project planning indicated that agency's desire to develop an "exceptional channel catfish fishery" in the Site 16 impoundment. Little emphasis is currently placed on developing a trout stocking program in the Site 16 reservoir at this time; however, trout fishing could become more of an agency priority in the future.

A specific plan for developing habitat within the reservoir for channel catfish has not been completed. A conceptual plan has been discussed for providing breeding cover, escape cover and other habitat enhancements beneficial to creating this fishery. Habitat enhancements proposed include: anchoring logs and tree-tops to create brush and woody debris piles; grading flat road-bed-like features for spawning areas for bass and pan fish; leaving the lake bottom in a rough irregular condition (no final grading to smooth features); constructing hills and hummocks

on the reservoir bottom to diversify depth; and creating boulder clusters. Trees within the reservoir area will not be left for habitat because of Sponsor's concerns with floating debris collecting around the riser. It is proposed that vertical tree stems be left after tree tops are cut to provide vertical cover along the south shoreline. More specific plans for these habitat enhancements will be developed in consultation with WVDNR prior to construction in order that equipment on site may be utilized for creating these features. Lake habitat enhancements and improvement structures will be included as part of the approved compensatory mitigation plan for this project.

Because recreation is an important incidental use of this project, public access to the impoundment area will be provided. A parking area for recreational users will be provided on project property and a boat launching area will be constructed adjacent to the lake. Recreational users will have access to the area around the reservoir and walking paths will be graded along the north shoreline area. Walking access on the south shoreline will not be developed due to rough topography in that area.

MONITORING PLAN

A monitoring plan for mitigation measures will be developed and implemented in accordance with permit requirements. This monitoring plan will define the frequency for mitigation site reviews to insure the installed measures are functioning in accordance with their design and prescribe the process for reporting the findings of field reviews to the appropriate regulatory agencies.

Control of Erosion and Sedimentation

An erosion and sediment control plan will be developed by NRCS and approved by the WVDEP. This plan is required in conjunction with the construction storm water NPDES permit and will include Best Management Practices (BMPs) and other measures to minimize soil erosion from disturbed areas and prevent sediment from being deposited in undesirable locations. Erosion and sediment control measures may include minimizing the size of disturbed areas, diverting surface water from disturbed areas, temporary seeding and mulching of soil stockpiles, seeding and mulching areas upon completion of final grading, installing approved stream crossings, installing silt fences, installing sediment retention basins and other necessary BMP measures.

Permits and Compliance

Section 404 of the Federal Water Pollution Control Act of 1972, as amended, requires that the deposition of dredged or fill material into wetlands and Waters of the US be authorized by the Department of the Army. Therefore, a U.S. Army Corps of Engineers permit will be required prior to installation of the project. A Section 401 State Certification as required by the Clean Water Act must be issued by the WVDEP prior to construction. Also, a construction storm water NPDES permit will be required from the WVDEP, Division of Water and Waste Management. A Special Use permit will be obtained from the US Forest Service. The PVCD will be responsible for obtaining the necessary permits, including permits from the West Virginia Public Lands Corporation.

The PVCD, with assistance from NRCS, will develop temporary and permanent measures to control erosion and sediment that will be implemented by the construction contractor in

compliance with state water quality regulations. The measures will include best management practices as well as streambank stabilization, monitoring, and maintenance features.

A “Certificate of Approval” is required from the WVDEP Division of Water and Waste Management & Environmental Enforcement – Dam Safety Section pursuant to West Virginia State Code, 47-34-4.

The Sponsors will provide leadership in developing an Emergency Action Plan (EAP) prior to construction and will update the EAP annually with local emergency response officials. NRCS will provide technical assistance in the preparation of the EAP. The purpose of the EAP is to outline appropriate actions and to designate parties responsible for those actions in the event of a potential problem with a floodwater retarding structure.

Project Cost

Project costs include all costs necessary to install the recommended plan. Tables 1 and 2 display all estimated project costs. Costs for each project purpose were identified and allocated accordingly.

Construction Cost

Construction cost accounts for all material, labor, and equipment necessary to construct the dam, auxiliary spillway, mitigation, and water supply. These costs were estimated using 2009 prices. Costs for the dam, auxiliary spillway, and water supply system were estimated during the planning phase. Mitigation costs were estimated using traditional methods such as computing quantities of work and material and multiplying that by unit costs taken from sources such as Means Cost Data or recent NRCS bid abstracts.

The planning construction costs are estimated. Detailed structural designs and construction cost estimates will be prepared prior to contracting for the work to be performed. Final construction costs will be those costs actually incurred by the contractor performing the work, including the cost of any necessary contract modifications.

Engineering Costs

Engineering services include all costs associated with the design of the project and preparation of construction drawings. Engineering services cost for the dam design is the actual price paid to the engineering firm for designing the dam. The water supply design costs were estimated as percentages of the estimated construction cost for the respective items. NRCS engineering services cost was included for staff time for design contract supervision.

Project Administration Cost

Project administration cost includes NRCS staff costs for contract administration, construction inspection, and coordination with property acquisition and utility issues. Costs for land surveys, title opinions, appraisals, review appraisals, negotiations, and relocation assistance advisory are actual contract prices that will be paid for those services. NRCS staff time was estimated based on anticipated salaries for personnel.

Real Property Rights

The Sponsors will be responsible for 25% of the real property rights costs including costs necessary to obtain the land, easements, relocations, utility modifications, and rights-of-way needed to install the project. The acreage needed for purchase and easements was initially estimated using Hardy County tax maps, topographic maps developed by the NRCS, and USGS

7.5 minute topographic maps. Property surveys were completed by project sponsors in 2008. Real property rights will be secured to the top of dam elevation for the flood detention pool. Values for land and structures were initially estimated with the assistance of local officials. Property appraisals were completed by project sponsors in 2008. Road relocations and associated costs were estimated from historical contract costs, updated to current prices. Other utilities were estimated using information obtained from maps, visual inspections, and available historic utility modification cost data. These cost estimates will change as more detailed data becomes available. Site 16 will require 234.4 acres (all or part of 14 parcels) of proposed fee take acquisition and 44 acres of permanent easement involving two additional parcels as well as the Forest Service parcel. There are a total of three residences whose occupants will be relocated as a result of project acquisition. In February 2009, Local Sponsors made offers on all parcels. Settlement has been reached on one property and one relocation has been completed. In the event that additional voluntary settlements are not reached, Local Sponsors may use eminent domain to acquire the property.

Relocation Payments

Relocation payments are paid to families and businesses that have to be relocated as a result of the project installation. These payments enable relocated families to obtain new housing without undue financial hardship and assists businesses to relocate with minimal cost. Relocation costs are estimated using the guidelines set forth in the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended.

Operation and Maintenance (O&M)

The Sponsors will be responsible for operation and maintenance costs for the dams, including all annual costs needed to conduct yearly inspections, produce O&M reports, and perform necessary maintenance during the operational life of the project. A specific operation and maintenance plan, utilizing the NRCS National Operation and Maintenance Manual, will be prepared for Site 16 before issuing invitations to bid for construction. The term of this new O&M agreement will be for a period of 100 years, which is the life expectancy of the project.

Installation and Financing

The installation of the project is funded by the NRCS and the Sponsors. Technical assistance is provided by the NRCS. The Sponsors will be responsible for the construction costs and landrights associated with the water supply component at Site 16.

Tabulation 7.
LIST OF PREPARERS AND QUALIFICATIONS

NAME	PRESENT TITLE/ OTHER EXPERIENCE (Years in Job)	EDUCATION Degree(s) Continuing Education Subjects	OTHER (licenses, etc.)
Andy Deichert	Civil Engineer (16)	BS & MS Agricultural Engineering	Registered Professional Engineer
Ed Kesecker	District Conservationist (31) (Retired 2007)	BS Agriculture	
Pam Yost	Economist (18)	BS Resource Management MS Agricultural Economics	
Timothy Ridley	Hydraulic Engineer (18) Consulting Engineer (8)	BS Civil Engineering	Registered Professional Engineer Professional Surveyor
Jeff McClure	Geologist (2) WV DEP Geologist (10)	BS Geology BA Biology	
Bryan Lee	Cultural Resources Specialist (5) Archaeologist (10)	BA Anthropology MA Anthropology	
Ron Wigal	Soil Conservationist (17) Environmental Specialist (3)	BS Wildlife Management MS Wildlife Management	
Thomas Tamasco	Civil Engineer (2) Dam Safety Engineer (7)	BS Civil Engineering Technology	Registered Professional Engineer
Kristin Smith *	Water Quality Specialist (6) Ecologist/Environmental Compliance specialist (5)	BS Environmental Studies MS Forestry	
David Heffington *	Corps of Engineers-Regulatory (13) Natural Resource Specialist/Ecologist (9)	BS Biology/Geography	
Matt Harrington *	Biologist/Environmental Scientist (12) National Environmental Coordinator (1)	BS Environmental Science /Biology MS Environmental Science	

* NRCS Specialists who assisted with the preparation of 'Need and Purpose' and 'Cumulative Effects' sections

LITERATURE CITED

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Bodor, Thomas and Karl Franz. 2008. Phase I Archeological Survey and Phase II Archeological Evaluation of Sites 46HY495, 46HY497, and 46HY501, Lost City, Hardy County, West Virginia. On file West Virginia Division of Culture and History, Charleston, WV.

Cardwell, Dudley H., Erwin, Robert B., and Woodward, Herbert P. 1968. Geologic Map of West Virginia. West Virginia Geological and Economic Survey.

Creman, Gretchen, Alana Hartman and Neil Gillies. 2005. The Lost River Watershed Based Plan. WVDEP website publication. Charleston, WV.

Dean, S. L., Kulander, B. R., and Lessing, P., Geology of the Bergton, Lost City, Lost River State Park, and Orkney Springs Quadrangles, Hardy County, WV, West Virginia Geological and Economic Survey, 1992.

Development of Design Data for Planning and Preliminary Design of Lost River Site 16. 2005-2006. United States Department of Agriculture, Natural Resources Conservation Service.

Estep, Ron. 1989. Soil Survey of Grant and Hardy Counties, West Virginia, United States Department of Agriculture, Soil Conservation Service.

Economic Summary, Workforce West Virginia, Research, Information, and Analysis, various issues.

Engineering News Record, March 2006 construction cost index. Website: www.enr.com

Federal Energy Regulatory Commission. 2006. Cove Point Expansion Project – Final Environmental Impact statement. Washington, D.C.

Federal Energy Regulatory Commission. 2005. Hardy Storage and Transmission Projects – Environmental Assessment. Washington, D.C.

Hardy County Public Service District. 2003. Preliminary Engineering Report for Hardy County Public Service District Baker/Mathias Water Distribution System. Thrasher Engineering, Clarksburg, WV.

Niemel, Karen. 2005. Phase I Cultural Resources Report for Dam Site 16, Lost River Watershed, Hardy County, West Virginia. On file West Virginia Division of Culture and History, Charleston, WV.

Potomac Valley Soil Conservation District; Hardy County Commission; West Virginia Soil Conservation Agency; U. S. Department of Agriculture, Natural Resources Conservation Service and Forest Service. 2001. Final Supplemental Watershed Plan Agreement No. 3 and Environmental Assessment for Lost River Subwatershed or Potomac River Watershed, Hardy County, West Virginia. 12 pp.

Price, Paul H., Prouty, William F., Tilton, John L., and Tucker, R. C. 1927. Hampshire and Hardy Counties Geological Report, West Virginia Geological Survey.

U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Washington, D.C.

U.S. Census Bureau; Census 2000, Summary File 1 (SF1) and 3 (SF 3); generated by Pam Yost; using American Factfinder; <<http://factfinder.census.gov/>>; (August 2004).

U.S. Department of Agriculture. 1992. National Watershed Manual. Soil Conservation Service.

US Department of Agriculture, Natural Resources Conservation Service and West Virginia Conservation Agency. April 2004. Hardy County Water Resources Report. http://www.wv.nrcs.usda.gov/programs/watershed/lost/lost_river.html.

United States Department of Agriculture. 2004. U.S. Census of Agriculture, Census 2002, Summary and State Data, Volume 1, Geographic Area Series, Part 51, National Agricultural Statistics Service.

US Department of Agriculture. 1990. Urban Floodwater Damage Economic Evaluation URB1, Soil Conservation Service.

US Department of Agriculture. 2005. Part 630 Hydrology National Engineering Handbook, Chapter 31, Computer Program for Water Surface Profiles. Natural Resources Conservation Service.

US Department of Agriculture. 1992. Technical Release No. 29 (TR-29) Project Formulation Hydrology. Natural Resources Conservation Service.

U.S. Department of Agriculture, Rural Utilities Service. 2004. Supplemental Environmental Report for the Hardy County Public Service District – Baker/Mathias Water Distribution System Raw Water Treatment Plant. Thrasher Engineering, Clarksburg, WV.

U. S. Department of Agriculture, Soil Conservation Service. 1974. Lost River Subwatershed of the Potomac River Watershed, Hardy County, West Virginia – Environmental Impact Statement. 91 pp.

U. S. Department of Agriculture, Soil Conservation Service. 1994. Environmental Information Report – Dam Site 27 – Upper Cove Run, Lost River Watershed, Hardy County, West Virginia. 13 pp.

U. S. Department of Agriculture, Soil Conservation Service. 1990. Supplemental Information Report - Lost River Watershed Project, Hardy County, West Virginia. 18 pp.

U. S. Department of Agriculture, Soil Conservation Service. 1989. Addendum to Lost River Subwatershed of Potomac River Watershed Environmental Impact Statement – Environmental Assessment Report for Dam Site No. 4, Kimsey Run, Hardy County, West Virginia. 18 pp.

U.S. Department of Interior, Fish and Wildlife Service. 1980. Habitat Evaluation Procedures (HEP). Ecological Services Manual (ESM) 102. U.S. Fish and Wildlife Service, Division of Ecological Services. Government Printing Office, Washington, D.C. 84pp.+ appendices.

US Department of Interior, Fish and Wildlife Service and US Department of Commerce. 2002. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation – West Virginia.

U.S. Environmental Protection Agency. 1998. Fecal Coliform TMDL Development for Lost River, Hardy County, West Virginia. EPA Region 3, Philadelphia, PA.

US Geological Survey. <http://nwis.waterdata.usgs.gov/nwis/gwdata>.

US Water Resources Council. 1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies,

WV Department of Transportation, Division of Highways and the Federal Highway Administration. 1996. Appalachian Corridor H, Elkins, West Virginia to Interstate 81, Virginia. Final Environmental Impact Statement, Charleston, WV.