FINAL
Supplemental Watershed Plan No. 6 & Environmental Assessment

for the

Rehabilitation of Floodwater Retarding Structure No. 10

of the Upper North River Watershed

Augusta County, Virginia

PREPARED BY

USDA Natural Resources Conservation Service

IN COOPERATION WITH
Augusta County Board of Supervisors
Headwaters Soil and Water Conservation District
USDA Forest Service

SEPTEMBER 2012

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U.S. Forest Service

Authority

The original work plan was prepared and the works of improvement were installed under the authority of the Flood Control Act of 1944 (Public Law 78-534), as amended. The rehabilitation of Upper North River Dam No. 10 is authorized by the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566), as amended by the Small Watershed Rehabilitation Amendments of 2000.

Abstract

Upper North River Dam No. 10, Todd Lake, does not presently meet NRCS or Virginia safety standards for the integrity, stability, and capacity of the auxiliary spillway. The recommended plan will rehabilitate Upper North River Dam No. 10 dam to meet current safety and design criteria. The plan provides for widening the auxiliary spillway by 20 feet and lengthening the control section. A secant pile wall will be installed at the downstream end of the control section. Articulated Concrete Blocks will be used to armor the auxiliary spillway from the upstream end of the control section to the end of the constructed outlet. Upstream and downstream training dikes will be installed. The dam embankment will be raised by 5.5 feet with earthfill. The principal spillway riser will be replaced. There will be no change in the current levels of flood protection downstream as a result of project activity.

Comments and Inquiries

For further information, please contact: John A. Bricker, State Conservationist, USDA - Natural Resources Conservation Service, 1606 Santa Rosa Road, Suite 209, Richmond, Virginia 23229-5014, (804) 287-1691.

UPPER NORTH RIVER WATERSHED AGREEMENT

Supplemental Watershed Plan Agreement
(Supplement No. 6)

between the

Augusta County Board of Supervisors
Headwaters Soil and Water Conservation District
(herein referred to collectively as "Sponsors")
Commonwealth of Virginia

and the

Natural Resources Conservation Service
United States Department of Agriculture
(herein referred to as "NRCS") in cooperation with the
United States Department of Agriculture, Forest Service
(herein referred to as the "U.S. Forest Service")

Whereas, the Watershed Work Plan Agreement for the Upper North River Watershed, Commonwealth of Virginia, authorized under the Flood Control Act of 1944 (Public Law 78-534, as amended) and executed by the Sponsors named therein and the Soil Conservation Service (which is now NRCS, pursuant to section 246 of the Department of Agriculture Reorganization Act of 1994, 7 U.S.C. 6862), became effective the 11th day of August 1960; and

Whereas, Supplement No. 1, which modified the Watershed Plan Agreement, was developed through cooperative efforts of the Sponsors and the Soil Conservation Service and became effective on the 17th day of October 1961; and

Whereas, Supplement No. 2, which modified the Watershed Plan Agreement, was developed through cooperative efforts of the Sponsors and the Soil Conservation Service and became effective on the 14th day of May 1962; and

Whereas, Supplement No. 3, which modified the Watershed Plan Agreement, was developed through cooperative efforts of the Sponsors and NRCS and became effective on the 18th day of March 1964; and

Whereas, Supplement No. 4, which modified the Watershed Plan Agreement, was developed through cooperative efforts of the Sponsors and NRCS and became effective on the 8th day of June 1993; and

Whereas, Supplement No. 5, which modified the Watershed Plan Agreement, was developed through cooperative efforts of the Sponsors and NRCS and became effective on the 18th day of April 2000; and

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsors for assistance in preparing a plan for rehabilitation of the works of improvement for the Upper North River Dam No. 10 located in Augusta County, Commonwealth of Virginia, under the authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566, as amended); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act of 1954 has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, through the cooperative efforts of the Sponsors and NRCS, a Supplemental Watershed Plan and Environmental Assessment has been developed to rehabilitate the Upper North River Dam No. 10, Commonwealth of Virginia, hereinafter referred to as the Watershed Project Plan or Plan, which Plan is annexed to and made a part of this agreement; and

Whereas, in order to provide for rehabilitation of the Upper North River Dam No. 10, it has become necessary to modify the Supplemental Watershed Plan Agreement;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS and the Sponsors hereby agree on this Supplemental Watershed Plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this Supplemental Watershed Agreement and including the following:

1. **Term.** The term of this agreement is for the installation period and evaluated life of the project (50 years) and does not commit the NRCS to assistance of any kind beyond the end of the evaluated life.

2. **Costs.** The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.

3. **Real property.** The Sponsors will acquire such real property as will be needed in connection with the works of improvement. The amounts and percentages of the real property acquisition costs to be borne by the Sponsors and NRCS are as shown in the Cost-Share table in Section 5 hereof. The Sponsor acknowledges the potential risk of flood damages for the real property between the flowage rights elevation and the top of dam elevation.

4. **Uniform Relocation Assistance and Real Property Acquisition Policies Act.** The Sponsors hereby agrees to comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4601 et. seq. as further implemented through regulations in 49 C.F.R. Part 24 and 7 C.F.R. Part 21) when acquiring real property interests for this federally assisted project. If the Sponsors are legally unable to comply with the real property acquisition requirements, it agrees that, before any Federal financial assistance is furnished; it will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.

5. **Cost-share for Rehabilitation Project.** The following table will be used to show cost-share percentages and amounts for Watershed Project Plan implementation.

Works of Improvement	**NRCS**		**Sponsors**		**Total**
Cost-Sharable Items	**Percent**	**Cost**	**Percent**	**Cost**	**Cost**
Rehabilitation of the dam (construction costs):	65%	$3,181,000	35%	$1,700,000	$4,881,000
Relocation, Replacement in-kind:	0%	$0	0%	$0	$0
Relocation, Required Decent, Safe, Sanitary:	0%	$0	0%	$0	$0
Sponsors' Planning Costs:	n/a	n/a	100%	$5,000	$5,000
Sponsors' Engineering Costs:	n/a	n/a	100%	$2,000	$2,000
Sponsors' Project Administration Costs:	n/a	n/a	100%	$6,000	$6,000
Land Rights Acquisition Costs:	n/a	n/a	100%	$0	$0
Subtotals: Cost-Sharable Costs: Cost-Share Percentages:[a/]	(65%)	**$3,181,000**	(35%)	**$1,713,000**	**$4,894,000** (100%)
Non Cost-Sharable Items (per PL-83-566 and NRCS policy)[b/]	---	---	---	---	---
NRCS Engineering and Project Administration Costs:	100%	$525,000	n/a	n/a	$525,000
Natural Resource Rights:	n/a	n/a	0%	$0	$0
Federal, State and Local Permits:	n/a	n/a	100%	$1,000	$1,000
Relocation, Beyond Required Decent, Safe, Sanitary	n/a	n/a	0%	$0	$0
Subtotals: Non-Cost-Sharable Costs:	**100%**	**$525,000**	**100%**	**$1,000**	**$526,000**
Total Cost-Sharable Cost	**n/a**	**$3.706,000**	**n/a**	**$1,714,000**	**$5,420,000**
Total Installation Cost [c/]	**n/a**	**$3.706,000**	**n/a**	**$1,709,000**	**$5,415,000**

a/ The maximum NRCS cost-share is 65% of the cost-sharable items not to exceed 100% of the construction cost. Total eligible project costs include construction, land rights, relocation, project administration, and planning services provided by the Sponsors. Not included are NRCS engineering technical assistance costs of $475,000 and NRCS project administration costs of $50,000;

b/ If actual non-cost-sharable item expenditures vary from these estimates, the responsible party will bear the change in costs.

c/ The Total Installation Cost excludes the Sponsors' Planning Cost of $5,000.

6. **Land treatment agreements.** Approximately 98% of the drainage area above Upper North River Dam No. 10 is wooded with the remaining 2% in open space, hay/pasture, and open water. It is expected to remain as such. Therefore, there is no need for additional erosion control measures in the watershed. Thus, there is no requirement for the Sponsors to obtain agreements for protection of the upstream watershed.

7. **Floodplain Management.** Before construction of any project for flood prevention, the Sponsors shall agree to participate in and comply with applicable Federal floodplain management and flood insurance programs.

8. **Water and mineral rights.** The Sponsors will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to State law as may be needed in the installation and operation of the works of improvement. Any costs incurred shall be borne by the Sponsors and these costs are not eligible as part of the Sponsors' cost-share.

9. **Permits.** The Sponsors will obtain and bear the cost for all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement. These costs are not eligible as part of the Sponsors' cost-share.

10. **NRCS assistance.** This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the rehabilitation plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.

11. **Additional agreements.** A separate agreement will be entered into between NRCS and the Sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. **Amendments.** This plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may de-authorize or terminate funding at any time it determines that the Sponsors have failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS shall promptly notify the Sponsors in writing of the determination and the reasons for de-authorization of project funding, together with the effective date. Payments made to the Sponsors or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been de-authorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the Sponsors having specific responsibilities for the measure involved.

13. **Prohibitions.** No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

14. **Operation and Maintenance (O&M).** The Sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with an O&M agreement. An O&M agreement will be entered into before Federal funds are obligated and continue for the project life (50 years). Although the Sponsors' responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the Sponsors acknowledge that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.

15. **Emergency Action Plan.** Prior to construction, the Sponsors shall prepare an Emergency Action Plan (EAP) for each dam or similar structure where failure may cause loss of life or as required by state and local regulations. The EAP shall meet the minimum content specified in Part 500.52 of the NRCS Title 180, National Operation and Maintenance Manual (NOMM), Part 500, Subpart F, Section 500.52, and meet applicable State agency dam safety requirements. The NRCS will determine that an EAP is prepared prior to the execution of fund obligating documents for rehabilitation of the structure. The EAP shall be reviewed and updated by the Sponsors annually.

16. **Nondiscrimination provisions.** The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, DC 20250-9410 or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.

    By signing this agreement, the recipient assures the U.S. Department of Agriculture that the program or activities provided for under this agreement will be conducted in compliance with all applicable Federal civil rights laws, rules, regulations, and policies.

17. **Certification Regarding Drug-Free Workplace Requirements** (7 CFR Part 3021). By signing this watershed agreement, the Sponsors are providing the certification set out below. If it is later determined that the Sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled Substance means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation (21 CFR 1308.11 through 1308.15);

Conviction means a finding of guilt (including a plea of *nolo contendere*) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of sub-recipients or subcontractors in covered workplaces).

Certification:

A. The Sponsors certify that they will or will continue to provide a drug-free workplace by:

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(2) Establishing an ongoing drug-free awareness program to inform employees about—
   (a) The danger of drug abuse in the workplace;
   (b) The grantee's policy of maintaining a drug-free workplace;
   (c) Any available drug counseling, rehabilitation, and employee assistance programs; and
   (d) The penalties that may be imposed upon employees for drug abuse violation occurring in the workplace;

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will--
   (a) Abide by the terms of the statement; and
   (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employees who is so convicted--

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(b) Requiring such employee to participate satisfactorily in drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1),(2),(3),(4),(5),and (6).

B. The Sponsors may provide a list of the site(s) for the performance of work done in connection with a specific project or other agreement.

C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

18. Certification Regarding Lobbying (7 CFR 3018)

A. The Sponsors certify to the best of their knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress , an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The Sponsors shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, of the U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

19. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR 3017).

A. The Sponsors certify to the best of their knowledge and belief, that they and their principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (A)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

B. Where the primary Sponsor is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

20. Clean Air and Water Certification

A. The project Sponsoring organizations signatory to this agreement certify as follows:

(1) Any facility to be utilized in the performance of this proposed agreement is (__), is not (_X_) listed on the Environmental Protection Agency List of Violating Facilities.

(2) To promptly notify the NRCS-State Administrative Officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any

facility which is proposed for use under this agreement is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities.

(3) To include substantially this certification, including this subparagraph, in every nonexempt sub-agreement.

B. The project Sponsoring organization(s) signatory to this agreement agrees as follows:

(1) To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.

(2) That no portion of the work required by this agreement will be performed in facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.

(3) To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.

(4) To insert the substance of the provisions of this clause in any nonexempt subagreement.

C. The terms used in this clause have the following meanings:

(1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).

(2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).

(3) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under section 112 of the Air Act (42 U.S.C. Section 7412).

(4) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. Section 1317).

(5) The term "facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a Sponsor, to be utilized in the performance of an agreement or subagreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

21. **Assurances and Compliance.** As a condition of the grant or cooperative agreement, the Sponsors assure and certify that they are in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as specifically set forth herein.

    State, Local, and Indian Tribal Governments: 2 CFR 225 (OMB Circular A-87, A-129, and A-133); 7 CFR Parts 3015, 3016, 3017, 3018, 3021, and 3052; and OMB Circular A-102.

    Nonprofit Organizations, Hospitals, Institutions of Higher Learning: 2 CFR 215 (OMB Circular A-110), 2 CFR 230 (OMB Circular A-122, A-129, and A-133); and 7 CFR Parts 3015, 3017, 3018, 3019, 3021, and 3052.

22. **Examination of Records.** The Sponsors shall give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

Augusta County Board of Supervisors
Augusta County Government Center
18 Government Center Lane
Verona, Virginia 24482

By: Tracy C. Pyles, Jr.
TRACY C. PYLES, Jr.

Title: Chairman

Date: 8/22/12

The signing of this supplemental watershed agreement was authorized by the governing body of the Augusta County Board of Supervisors at a meeting held on August 22, 2012.

Rita R. Colaw
Notary

NOTARY PUBLIC REG. # 189329 MY COMMISSION EXPIRES 11/30/15 COMMONWEALTH OF VIRGINIA

18 Government Center Lane
Verona, Virginia 24482

Date: 8/22/12

Headwater's Soil and Water
Conservation District

By: Charles E. Horn
CHARLES E. HORN

Augusta County Government Center
USDA Building
70 Dick Huff Lane
Verona, Virginia 24482

Title: Chairman

Date: 8-21-12

The signing of this supplemental watershed agreement was authorized by the governing body of the Headwaters Soil and Water Conservation District at a meeting held on 8-21-12.

Cathy Perry
Office Administrator

Augusta County Government Center
USDA Building
70 Dick Huff Lane
Verona, Virginia 24482

Date: 8-21-12

Natural Resources Conservation Service
United States Department of Agriculture

Approved by:

John A. Bricker
JOHN A. BRICKER
State Conservationist

Date: August 30, 2012

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SUMMARY OF SUPPLEMENTAL WATERSHED PLAN No. 6 AND ENVIRONMENTAL ASSESSMENT
for the
Rehabilitation of Upper North River Watershed Dam No. 10
Augusta County, Virginia
6th Congressional District

Prepared by: United States Department of Agriculture, Natural Resources Conservation Service (NRCS) and in cooperation with the United States Department of Agriculture, Forest Service (U.S. Forest Service).

Authorization: Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566), as amended by the Small Watershed Rehabilitation Amendments of 2000.

Sponsors: Augusta County Board of Supervisors

Headwaters Soil and Water Conservation District

Proposed Action: Rehabilitate Upper North River Watershed Dam No. 10, Todd Lake, to meet current safety and design criteria.

Purpose and Need for Action: The Upper North River Dam No. 10, Todd Lake, does not presently meet NRCS or Virginia Division of Dam Safety standards for the stability, capacity, and integrity of the vegetated earthen auxiliary spillway. There are lives and property downstream of this structure that need flood protection. The purpose of this action is to continue to provide 100-year flood protection in a manner that minimizes risk of loss of human life and is both cost effective and environmentally acceptable.

Description of Preferred Alternative: The plan provides for widening the auxiliary spillway by 20 feet and lengthening the control section. A secant pile wall will be installed at the downstream end of the control section. Articulated Concrete Blocks will be used to armor the auxiliary spillway from the upstream end of the control section to the end of the constructed outlet. Upstream and downstream training dikes will be installed. The dam embankment will be raised by 5.5 feet with earthfill. The principal spillway riser will be replaced. There will be no change in the current levels of flood protection downstream as a result of project activity.

Resource Information:

Location: Latitude: 38.3641667 Longitude: -79.206111

8-Digit Hydrologic Unit Number: 02070005

Climate and Topography: The watershed has a continental, humid, temperate climate, and is characterized by warm to hot summers and rather cold winters. Todd Lake is located in the Ridge and Valley Physiographic Province. The topography ranges from steep mountain terrain to flat to gently sloping valleys.

Watershed Size: Upper North River Watershed = 67,961 acres
Drainage Area of Todd Lake = 2,473 acres

Land Use: Woodland: 2,421.5 acres, 97.93%
Open Space: 42.6 acres, 1.72%
Hay/Pasture: 2.8, 0.11%
Water: 6 acres, 0.24%

Land Ownership: Upstream of dam: 3.8% private, 96.2% public
Downstream of dam: 92.7% private, 7.3% public

Population and Demographics: According to 2010 Census of the Population from the Census Bureau for the population of the U.S., Augusta County had a total population of 73,750 (up from 65,615 in 2000 – a 12.4% increase). Of the total population, about 93.4% (68,848) were white and 4% (2,930) were Black or African American. All other racial groups individually were 0.5% of the total population or less. Together, white and blacks made up 97.3% of the county's entire population. Hispanics of any race are the second largest minority group with 2.1%, or 1,525. "Other races" combined constituted 5.4% of the Augusta County population with 3,991. Native Americans have a very small presence with only 0.2% of the population (160).

The 2006-2010 Census estimates indicate that there were 30,768 housing units within Augusta County with 90.7% occupied with 81.3% owner-occupied and 18.7% renter-occupied. The state-wide occupancy rate for Virginia as a whole reported in the 2006-2010 estimates was 89.7% and the national figure was 86.9%. The state-wide and national rates for owner-occupancy were 68.9% and 65.4% respectively. Residential property values for the land and associated buildings downstream of the dam range between $50,000 and $400,000 with an average of $150,000. The total value of residential property (structures and contents only, excluding land values) at risk below the dam is an estimated $36,135,000.

Augusta County residents are estimated to have had per capita incomes of $23,571 for the 2006-2010 period. Virginians reported per capita income of $32,145 for the 2006-2010 period, while the same figure for the entire United States was $26,059 for 2006-2010. That makes the county per capita income figure for 2006-2010 73% of the state's level and 90% of the national figure.

Cultural Resources: As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on inventories and investigations of cultural resources and other responsibilities per Section 106 of the National Historic Preservation Act. U.S. Forest Service cultural resources staff completed database searches for any known cultural resources and ground surveyed the project area (56.3 acres) for evidence of archaeological and/or historical resources that had the potential to be impacted. Consultation with the Virginia Department of Historic Resources (VDHR) was initiated in February 2011 by the U.S. Forest Service with the submission of a cultural resources reconnaissance report pertaining to the proposed Todd Lake Dam rehabilitation project. On March 15, 2011, the VDHR indicated their concurrence with the U.S. Forest Service's finding of "*no historic properties affected*" for the proposed Todd Lake dam project.

Highly Erodible Cropland: None exists in the watershed.

Threatened and Endangered Species: As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on investigations and inventories of endangered, threatened, and sensitive (TES) species and other responsibilities per the Endangered Species Act (ESA) and completed a Biological Evaluation (BE) and Biological Assessment (BA) per U.S. Forest Service policy. The information that follows has been summarized from the BE/BA which can be found in Appendix E.

Only the Indiana Bat (*Myotis sodalist)* is known to occur or could be potentially affected by the proposed project. Despite the existence of potential bat habitat, during past and recent surveys, no Indiana bats have been seen in the project area. The proposed project will have no effect on any other federally listed or proposed species or their designated or proposed critical habitat. Likewise, primarily because there are no sensitive species or likely habitat present, the project will have no impact to any other identified sensitive species.

Wetlands: There are approximately 0.1 acres of fringe wetlands around the perimeter and 5.8 acres of open water wetlands associated with Todd Lake. No additional wetlands were identified within the project area boundaries.

Resource Concerns Identified Through Scoping: See Table S1.

Alternative Plans Considered: There are five plans that were considered and evaluated in detail:

1) *No Federal Action (Sponsors' Rehabilitation)*: Same as *Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth.*

2) *Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative):* Widen the auxiliary spillway to 220 feet, increase the length of the control section to 50 feet, install a concrete cutoff wall made of secant piles at the end of the control section, armor the control section and outlet section with ACB armor, and raise the top of the dam by 5.5 feet with earthfill.

3) *Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall:* Widen the auxiliary spillway to 220 feet, increase the length of the control section to 50 feet, install a concrete cutoff wall made of secant piles at the end of the control section, armor the control section and outlet section with ACB armor, and raise the top of the dam by 5.5 feet with a concrete parapet wall.

4) *Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway:* Fill the existing auxiliary spillway with earth and construct a new 400-foot wide RCC chute spillway in the center of the dam.

5) *Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation:* Remove some of the earth embankment of the dam to allow safe, non-erosive passage of the 100-year flood flow. Floodproof or elevate 28 homes and two businesses in the 100-year floodplain and re-locate one home.

All of the rehabilitation plans will include replacement of the principal spillway riser. The Sponsors have indicated that they will use the plan developed by NRCS to complete the rehabilitation of the dam in the event that Federal funding is not available. The *No Federal Action (Sponsors' Rehabilitation)* alternative would be the same or involve the same components as the *Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative)*. Although this is not the least cost alternative in terms of construction costs, this alternative has positive average annual benefits, has a benefit/cost ratio approaching 1:1, and is the rehabilitation alternative preferred by the Sponsors.

Project Benefits: Rehabilitation reduces the potential for loss of life and maintains protection of existing infrastructure downstream of the dam as well as property values around the lake and associated recreational opportunities. Net average annual equivalent benefits between the Future with Federal Project (FWFP) and the Future without Federal Project (FWOFP) = $0. This is due to the fact that the candidate plans to rehabilitate Todd Lake are identical in scope, substantially equivalent costs and equal effects.

Number of Direct Beneficiaries: Onsite – 4,400, Offsite – 440 residents and 1,000 people in vehicles daily

Other beneficial effects:

- Minimizes the threat to loss of life to approximately 440 people that live in the 80 single family homes within the breach inundation zone.
- Provides protection for approximately 740 vehicles on a daily basis that utilize Stokesville Road (520 vehicles), Towers Road (190 vehicles), and Reeves Road (30 vehicles).
- Provides onsite benefits to approximately 4,400 people and offsite benefits to an additional 1,000 people (vehicle occupants).
- Minimizes the threat of loss of access and loss of emergency services for 52 residences, two business structures, and one church building.
- Provides downstream flood protection for the residents in the area, as well as those working, recreating, or traversing within the downstream floodplains, for an additional 50 years.
- Eliminates the liability associated with continuing to operate an unsafe dam.
- Maintains existing stream habitat downstream of the dam.
- Retains the existing aquatic and terrestrial habitat in and around the lake.
- Leverages federal resources to install the planned works of improvement.

Benefit to Cost Ratio (authorized rate): 1.4 to 1.0

Benefit to Cost Ratio (current rate): 1.0 to 1.0

Net beneficial effects (NED): $0

Funding Schedule: The most likely scenario, assuming that funding continues, is for funds to be authorized within one fiscal year (budget authorization/allocation year), and for the project to be implemented over two years including one year for development of the design and one year for construction.

Federal funds: Year 1 - $75,000 for engineering and project administration; **Year 2** - $35,000 for construction supervision and project administration and $4,881,000 for construction;

Non-Federal funds: Year 1 - $1,000 for engineering and $1,000 for permitting costs; **Year 2** - $8,000 for engineering and project administration and $1,700,000 for construction;

Period of Analysis: 52 years (includes 1 year for design and 1 year for construction)

Project Life: 50 years

Table S1. Resource Concerns Identified Through Scoping.

Item/Concern	Rationale
WATER	
Floodplain Management	Additional management needed if decommissioned.
Sewer utilities	Campground sewer line running through lake and dam may be in need of upgrade. Caution working around drainfield below dam.
Streams, Lakes, and Wetlands	The lake will be temporarily drained during construction.
Water quality	Possibly a temporary increase of sedimentation during construction. E & S controls will be put in place during construction.
Water resources	Temporary loss of recreation during construction.
AIR	
Air Quality	Temporary effects during construction. Time of year restrictions for burning.
PLANTS	
Forest resources	Potential loss of trees.
Invasive species	Ensure none are introduced during implementation.
Natural areas	No State Designated Natural Areas present. Potential USFS wilderness area north of dam.
ANIMALS	
Fish and wildlife (including coordination requirements)	Short-term impacts to fish and wildlife habitat.
Migratory birds	Temporary effects during construction.
HUMAN	
Costs/ National Economic Development (NED)/P&G	Net Economic Development must be considered.
Construction access	Concern of how access will affect lake and campground users.
Environmental Justice and Civil Rights	No disparate treatment is anticipated.
Local and Regional Economy	Temporary positive effect during construction for local and regional construction companies. Temporary negative effect for loss of campground revenues during construction.
Public health and safety	Secure construction area during implementation (entire footprint of lake, spillway, and dam).
Public recreation	Temporary impacts for loss of use of lake, campground, and nearby trails during implementation.
Scenic beauty	Temporary impacts while lake is drawn down and unsightly construction equipment.
Social issues	Temporary impacts for loss of use of lake, campground, and nearby trails during implementation

Table S2. Project Costs (Dollars)

	PL-83-566 Funds		Other Funds		Total	
Category	**Dollars**	**%**	**Dollars**	**%**	**Dollars**	**%**
Construction	$3,181,000	65%	$1,700,000	35%	$4,881,000	100%
Engineering	$475,000	99.6%	$2,000	0.4%	$477,000	100%
Relocation	n/a	n/a	n/a	n/a	n/a	n/a
Real Property Rights	n/a	n/a	$0	100%	$0	100%
Project Administration	$50,000	89.3%	$6,000	10.7%	$56,000	100%
Other (permits)	$0	0%	$1,000	100%	$1,000	100%
TOTAL COSTS	**$3,706,000**		**$1,709,000**		**$5,415,000**	
Annual O&M (non-Federal)	n/a	n/a	$2,000	100%	$2,000	100%

Environmental Effects/Impacts:

Resource	Impact
Air Quality	Temporary increase in particulate matter on site during construction.
Land Use Changes	No effect.
Floodplains	Current floodplain would be maintained.
Fisheries	None present in lake.
Wildlife Habitat	No effect.
Wetlands	Temporary effects during construction on 5.8 acres of open water wetland and 0.1 acres of fringe wetland because lake will be drained. Permanent loss of 0.2 acres of open water wetland.
Prime Farmland	N/A
Cultural Resources	No effect.
Threatened and Endangered Species	No effect.
Mitigation	No compensatory mitigation is needed.

Major Conclusions: In order to bring this dam into compliance with State safety criteria, it is necessary to raise the dam height, rehabilitate the auxiliary spillway and replace the riser. The majority of the environmental impacts are short-term (only during construction) and existing conditions will be restored upon completion of construction.

Areas of Controversy: None

Issues to be Resolved: None

Evidence of Unusual Congressional or Local Interest: No

Is this report in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects? Yes X No ___

CHANGES REQUIRING PREPARATION OF A SUPPLEMENT

This supplement only addresses Upper North River Dam No. 10, known locally as Todd Lake. This dam was built in 1963 as a significant hazard dam. Due to changes in the downstream watershed, this dam was reclassified as a high hazard structure in 2008. With the hazard class change, this dam does not meet current USDA Natural Resources Conservation Service (NRCS) or Virginia Department of Conservation and Recreation, Division of Dam Safety and Floodplain Management (referred to herein as the Virginia Division of Dam Safety) dam design, safety, and performance standards for auxiliary spillway integrity, stability, and capacity. A conditional certificate for Operation and Maintenance of the structure was issued by the Virginia Division of Dam Safety because the vegetated earthen auxiliary spillway will not pass the Probable Maximum Flood (PMF) without breaching the structure or overtopping the dam. For this reason, the dam does not meet the objectives of the Augusta County Board of Supervisors and the Headwaters Soil and Water Conservation District (HSWCD) (herein referred to as Sponsors), which are to continue to provide flood protection and to reduce the risk of loss of human life.

This supplemental plan documents the planning process by which NRCS provided technical assistance to the local Sponsors and the public in addressing resource issues and concerns within the Todd Lake watershed. The plan was done in cooperation with the USDA Forest Service, George Washington and Jefferson National Forests, referred to herein as the U.S. Forest Service.

The recommended plan is to rehabilitate the Todd Lake dam to meet current safety and design criteria. The plan provides for widening the auxiliary spillway by about 20 feet and installing a secant pile wall at the end of the control section. The control section will be moved upstream and lengthened to 50 feet. The control section and the constructed outlet section will be armored with Articulated Concrete Blocks (ACBs) from the upstream end of the control section to the end of the constructed outlet. Two earthen training dikes will extend to the valley floor to protect the dam embankment. An inlet training dike will also be installed. The dam embankment will be raised by 5.5 feet with earthfill. The existing principal spillway riser will be replaced. There will be no change in the current levels of flood protection downstream as a result of project activity.

PURPOSE AND NEED FOR ACTION

The Upper North River Dam No. 10, Todd Lake, does not presently meet NRCS or Virginia Division of Dam Safety standards for the stability, capacity, and integrity of the vegetated earthen auxiliary spillway. There are lives and property downstream of this structure that need flood protection. The purpose of this action is to continue to provide 100-year flood protection in a manner that minimizes risk of loss of human life and is both cost effective and environmentally acceptable.

ORIGINAL PROJECT

A plan for flood prevention and watershed protection was authorized in 1960 under the authority of the Flood Control Act of 1944 (Public Law 534). The Shenandoah Valley Soil Conservation

District was the sole sponsor. The original work plan included the construction of three single-purpose dams designed for a 50-year life, an accelerated land treatment program for watershed protection, and 12 miles of stream channel improvement. Todd Lake (Dam No. 10) was built in 1963 as a significant hazard structure. Elkhorn Lake (Dam No. 76) and Hearthstone Lake (Dam No. 77) were built as high hazard structures in 1965 and 1966, respectively.

In 1961, the City of Staunton became a project sponsor and in 1962, the purpose of Elkhorn Lake was revised to include municipal water supply for the City of Staunton. A fourth flood control structure, Freemason Run (Dam No. 59), was added to the project in 1964 to provide protection of 162 acres of the floodplain. The Headwaters Soil and Water Conservation District and the Augusta County Board of Supervisors became project sponsors in 1993. These two sponsors then assumed responsibility for the operation and maintenance of Todd Lake and Hearthstone Lake. The dam on Freemason Run was not built due to geological faults in the area of the proposed dam site and the cost of relocating structures, roads, and utilities in the proposed floodpool. The channel work was also deleted from the planned works of improvement. The project was completed in April 2000.

WATERSHED PROBLEMS

In 2004, the Virginia Division of Dam Safety issued a conditional certificate for Todd Lake because of the potential need for a change in hazard class from significant to high. The hazard class was changed to high in 2008. The auxiliary spillway of a high hazard structure must have the integrity and capacity to pass the Probable Maximum Flood (PMF) storm flows without breaching the structure. Since a significant hazard structure is designed to pass only the ½ PMF event, the existing vegetated earthen auxiliary spillway does not meet the stricter criteria of the new classification.

Sponsor Concerns: A conditional certificate serves as notification to the Sponsors that the dam no longer meets State requirements and must be modified as soon as possible to meet State law. The presence of an unresolved conditional certificate leaves the Sponsors vulnerable to liability suits should the dam breach and downstream damages result. In order to address these concerns, the Sponsors commissioned a report from Gannett Fleming, Inc., to perform the field work, site investigations, and analyses necessary to document the existing conditions at Todd Lake. Based upon this additional information, the Sponsors requested NRCS assistance to prepare a watershed plan that would identify the improvements necessary to obtain full dam safety certification.

Soil Erodibility: In their 2006 report, Auxiliary Spillway Erodibility Study for Todd Lake Dam (Structure #10), Gannett Fleming, Inc. evaluated the geologic materials in the auxiliary spillway for use in the SITES auxiliary spillway erodibility analysis model. Although the auxiliary spillway has performed satisfactorily for nearly 50 years, based upon this analysis, the soils in the auxiliary spillway do not meet the required criteria for the stability and integrity of the auxiliary spillway for a significant hazard dam or a high hazard dam. Further analysis indicated that the capacity of the auxiliary spillway was not sufficient to pass the volume of water associated with the PMF event.

Floodplain Management: The Sponsors have identified flooding in the floodplain downstream as a primary concern. Augusta County has participated in the National Flood Insurance Program

since 1990, and realizes the value that Todd Lake provides in flood protection benefits, particularly for the roads. Todd Lake controls 3.86 square miles (2,473 acres) of the watershed above the affected properties.

Erosion and Sedimentation: As of 2010, Todd Lake had reached about 94.5% of its planned 50-year service life. The designed submerged sediment capacity was 56 acre-feet. As of 2010, there were 9.1 acre-feet of sediment in the pool area. This is about 16.25% of the designed sediment storage volume. This material is primarily deposited sediments plus leaf and other organic debris. Sediment is not considered to be a major problem in this lake.

Local Concerns: Todd Lake, Elkhorn Lake, and Hearthstone Lake were planned and constructed in response to the concerns of the residents after the extensive flooding that occurred in 1949. The possibility of decommissioning Todd Lake was mentioned at the first public meeting since it must be considered under the federal rehabilitation legislation. Residents were opposed to decommissioning because of their concern that flooding would increase in the absence of the dam. According to a letter from the U.S. Army Corps of Engineers, dated May 1960, the North River experienced seven large floods in the period from 1870 to 1949. In 1985, the area experienced heavy rainfall from Hurricane Juan. This event was immediately followed by a tropical low that produced even higher rainfalls. These combined events caused flow in the auxiliary spillway of Todd Lake. Hurricane Isabel, in 2003, filled the lake but did not cause the auxiliary spillway to flow.

WATERSHED OPPORTUNITIES

The following is a general list of opportunities that will be recognized through the implementation of this dam rehabilitation plan. Some quantification of these opportunities will be provided in other sections of the report, as appropriate.

- Comply with dam design and safety criteria established by NRCS and the Virginia Division of Dam Safety.
- Minimize the potential for loss of life associated with a failure of this dam.
- Reduce the sponsor liability associated with operation of an unsafe dam.
- Maintain the existing level of flood protection for downstream homes and infrastructure.
- Protect real estate values downstream from the dam.
- Maintain aquatic and terrestrial habitats around the lake.
- Preserve existing recreation opportunities.

SCOPE OF THE ENVIRONMENTAL ASSESSMENT

A scoping process was used to identify issues of economic, environmental, cultural, and social importance in the watershed. Watershed concerns of Sponsors, technical agencies, and local citizens were expressed in the scoping meeting and in other planning and public meetings. Factors that would affect soil, water, air, plant, animals, and human resources were identified by an interdisciplinary planning team composed of the following areas of expertise: engineering, biology, economics, resource conservation, water quality, soils, archaeology, and geology.

On November 17, 2011, a Scoping Meeting was held at the Augusta County Government Office Complex in Verona, Virginia. Specific concerns and their relevance to the proposed action to the decision making process were identified. Input was provided by Augusta County Community Development - Engineering Services, Augusta County's North River District Supervisor, the Augusta County Administrator, the Headwaters SWCD, the Virginia Department of Forestry, the Virginia Department of Environmental Quality, the Augusta County E-911 Emergency Communications Director, Virginia's 20th District State Delegate, the U.S. Forest Service, and a representative from Virginia's 6th Congressional District. These concerns are listed in Table A.

The citizens at the first Public Meeting, also held on November 17, 2012, expressed similar concerns.

Table A - Scoping Meeting Results For Rehabilitation of Todd Lake Dam
November 17, 2011

Item/Concern	Relevant to the Proposed Action		Rationale
	Yes	No	
SOILS			
Prime and Unique Farmland and farmland of statewide significance		X	None present.
Soil Resources		X	N/A
WATER			
Floodplain Management	X		Additional management needed if decommissioned.
Regional water resources plans (including coastal zone plans)		X	Watershed is in Chesapeake Bay drainage but not in a coastal zone management area. Local ordinances are in place to protect the Bay.
Sewer utilities	X		Campground sewer line running through lake and dam may be in need of upgrade. Caution working around drainfield below dam.
Sole source aquifers		X	N/A
Streams, Lakes, and Wetlands	X		The lake will be temporarily drained during construction.
Water quality	X		Possibly a temporary increase of sedimentation during construction. E & S controls will be put in place during construction.
Water resources	X		Temporary loss of recreation during construction.
Wild & scenic rivers		X	None present.
AIR			
Air Quality	X		Temporary effects during construction. Time of year restrictions for burning.
PLANTS			
Endangered and Threatened Species		X	None present.
Forest resources	X		Potential loss of trees.
Invasive species	X		Ensure none are introduced during implementation.
Natural areas	X		No State Designated Natural Areas present. Potential USFS wilderness area north of dam.
Riparian areas		X	Follow state guidelines for working in riparian areas.

Item/Concern	Relevant to the Proposed Action		Rationale
	Yes	No	
ANIMALS			
Coral reefs		X	None present.
Ecologically critical areas		X	None present.
Endangered and Threatened Species		X	None present.
Essential fish habitat		X	None present.
Fish and wildlife (including coordination requirements)	X		Short-term impacts to fish and wildlife habitat.
Invasive Species		X	Ensure none are introduced during implementation.
Migratory birds	X		Temporary effects during construction.
HUMAN			
Costs/ National Economic Development (NED)/P&G	X		Net Economic Development must be considered.
Construction access	X		Concern of how access will affect lake and campground users.
Cultural resources		X	No adverse impacts to cultural resources.
Environmental Justice and Civil Rights	X		No disparate treatment is anticipated.
Land Use		X	No anticipated changes.
Local and Regional Economy	X		Temporary positive effect during construction for local and regional construction companies. Temporary negative effect for loss of campground revenues during construction.
Parklands		X	No parklands present.
Public health and safety	X		Secure construction area during implementation (entire footprint of lake, spillway, and dam).
Public recreation	X		Temporary impacts for loss of use of lake, campground, and nearby trails during implementation.
Scenic beauty	X		Temporary impacts while lake is drawn down and unsightly construction equipment.
Scientific resources		X	N/A
Social issues	X		Temporary impacts for loss of use of lake, campground, and nearby trails during implementation

AFFECTED ENVIRONMENT

PLANNING ACTIVITIES

Geologic and engineering investigations and analyses were conducted by NRCS with assistance from the Headwaters Soil and Water Conservation District. This work included the sediment survey, the hydrologic and hydraulic analysis, and the SITES analysis of the dam characteristics. Both the existing conditions and proposed rehabilitation alternatives were evaluated with these tools.

Other planning activities included a land use inventory, natural resources inventories, wetland assessments, and the identification of threatened and endangered species and fish and wildlife resources. The U.S. Forest Service conducted the Biological Assessment of the site. Cultural and historic resources were investigated and a Phase I survey completed. Social and economic effects of the potential alternatives were evaluated for cost-effectiveness and for local acceptability. Both the benefits and the costs of the alternatives were computed and analyzed.

PHYSICAL FEATURES

Project Location: The watershed for Todd Lake is located in Augusta County, Virginia. Todd Lake is on Skidmore Fork which drains to the North River. The North River drains into the South Fork Shenandoah River which joins the North Fork Shenandoah River at Front Royal to become the Shenandoah River which drains into the Potomac River at Harpers Ferry, WV. The Potomac River flows into the Chesapeake Bay. The Todd Lake watershed is 2,473 acres (3.86 square miles). Appendix B shows the location map for this watershed.

Topography: Todd Lake is located in the Ridge and Valley Physiographic Province. The topography of the Ridge and Valley consists of long, relatively high ridges generally oriented in a northeast-southwest direction with continuous valleys in between. The elevation in the watershed ranges from about 1,880 feet at the dam to 4,351 feet at Little Bald Knob on the watershed divide.

Soils: The soils in the watershed consist primarily of the Berks, Hazleton, Lehew, and Hazleton-Lehew complex. Smaller areas of Allegheny, Craigsville, Leetonia, Monongahela, Rushtown, udorthents, and Weikert soils are also found in the watershed. At the project site, Weikert soil is located on the left abutment, and Berks soil is located along the right abutment of the dam and in the outlet of the existing auxiliary spillway. (For more information, see the Web Soil Survey at http://websoilsurvey.nrcs.usda.gov/.)

Geology: Based upon the published geologic maps for the area, the site is located within the Hampshire Formation composed of sandstone and interbedded mudstone deposited during the Devonian period. The Hampshire formation is overlain by alluvium deposited by Skidmore Fork in the valley floor. The deposited alluvium consists predominantly of sand, gravel, and silt with some cobbles and boulders.

The middle of the watershed is underlain by the Chemung Formation which consists of sandstone and shale, also of Devonian Age. The very upper end of the watershed is again underlain by the Hampshire Formation.

Climate: In the Ridge and Valley Physiographic Province, the average temperature is 36.6° F in the winter and 74° F in the summer. The last frost of spring normally occurs in late April to early May and the first frost in the fall occurs in mid to late October. This provides a growing season of approximately 190 to 231 days, depending on elevation. The average annual precipitation is about 41 inches. This precipitation is well distributed through the year with slightly large amounts occurring in the summer months. The average total snowfall in the western part of Augusta County is 16.1 inches.

The prevailing winds in the watershed are southwesterly, blowing hardest from January to April, with usually a light to moderate breeze at all times of the year. Average wind speed is approximately nine miles per hour during this time.

LAND USE

The drainage area upstream of Todd Lake is 2,473 acres. This area was derived using the Augusta County 2007 Elevation data and ArcGIS Hydrologic Analysis Tools. The Land Cover / Land Use was extracted from the 2006 National Land Cover dataset. Table B lists the land use upstream of the dam. This table also lists the land use in the Sunny Day Breach inundation zone below the dam. Appendix B contains the aerial photograph of the watershed.

Table B - Land Use

Land Cover Type	Drainage Area of Todd Lake (ac.)	Percent of Total	Sunny Day Breach Inundation Zone (ac.)	Percent of Total
Barren Land	-	-	0.5	0.02
Cultivated Crops	-	-	283.1	12.27
Forest	2,421.5	97.93	934.4	40.52
Developed, Low Intensity	-	-	38.8	1.68
Developed, Medium Intensity	-	-	1.2	0.05
Developed, Open Space	42.6	1.72	169.7	7.36
Hay/Pasture	2.8	0.11	876.1	37.99
Open Water	6.0	0.24	2.4	0.11
Total	**2,472.9**	**100.00**	**2,306.2**	**100.00**

THREATENED AND ENDANGERED SPECIES

As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on inventories and investigations of threatened and endangered (T&E) species for compliance with the Endangered Species Act and take the lead on any Section 7 consultation if necessary. The U.S. Forest Service prepared a Biological Evaluation/Biological Assessment (BE/BA) for the Todd Lake Dam rehabilitation project in accordance with U.S. Forest Service Policy. The objectives of the BE/BA are to: 1) ensure that NRCS and Forest Service actions do not contribute to trends toward federal listing; 2) comply with the requirements of the Endangered Species Act (ESA) so that federal agencies do not jeopardize or adversely modify critical habitat (as defined in ESA) of federally listed species; and 3) provide a process and standard to ensure that threatened, endangered, proposed, and sensitive (TES) species receive full consideration in the decision-making process. The best available science was used to meet these objectives. The following information is a summary of the methods, results, and conclusions of the BE/BA. The BE/BA is contained in Appendix E for detailed review and analysis.

The U.S. Forest Service performed state and federal database searches, consulted with area experts, reviewed known ranges, and completed field surveys of the entire project area for federal and state listed TES species. The BE/BA concluded that no TES species were found, nor was there habitat that would likely support TES species other than the Indiana bat (*Myotis sodalist*). Despite the existence of potential bat habitat, during past and recent surveys, no Indiana bats have been seen in the project area. Public scoping did not identify any other TES species known to occur on the project area that would be affected. Therefore, it is unlikely that any other TES species routinely occurs in the project area. For these reasons, other TES species were eliminated from further consideration.

Since there are no other T&E species or likely habitat present, the proposed project will have no effect on any other federally listed or proposed species or their designated or proposed critical habitat, regardless of the alternative selected. Likewise, since there are no sensitive species or likely habitat present, the project will have no impact to any other sensitive state and federal species of concern. NRCS concurs with the findings of the U.S. Forest Service of no effect on TES and/or its associated habitat.

Confirmed occurrence of a listed species in a project area requires consultation with the appropriate state or federal agencies. Since there are no confirmed occurrences of federal or state listed threatened or endangered species in the project area, further consultation with TES regulatory agencies is not required.

CULTURAL RESOURCES, NATURAL AND SCENIC AREAS, AND VISUAL RESOURCES

The National Register of Historic Places lists fifty sites in Augusta County. Seven archaeological sites within one mile of the project area are listed in the State archaeological files. However, none will be affected by the proposed work. There are no architectural sites listed in the State architectural files within one mile of the project area.

The National Historic Landmarks Program lists 119 sites, buildings or structures in Virginia, none of which are found in Augusta County. Therefore, none will be affected by the project activities.

There are three designated State Natural and Scenic Area Preserves in Augusta County. However, none are within the project vicinity. The Virginia Department of Conservation and Recreation (VDCR)-Natural Heritage Division (NHD) was invited to the scoping meeting on November 17, 2011. The VDCR-NHD stated in a November 9, 2011 letter that their "Biotics Data System documented the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources."

As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on inventories and investigations of cultural resources and other responsibilities per Section 106 of the National Historic Preservation Act. In February 2011, U.S. Forest Service cultural resources staff completed database searches for any known cultural resources and ground surveyed the project area (56.3 acres) for evidence of archaeological and/or historical resources that had the potential to be impacted. A pedestrian survey was conducted throughout the entire project area. Subsurface testing was implemented in areas having high potential of encountering cultural resources. In addition, areas of high visibility were also examined. No known cultural resources were found from the database searches and no cultural resources were encountered during the field investigation for the project area.

Consultation with the Virginia Department of Historic Resources (VDHR) was initiated in February 2011 by the U.S. Forest Service with the submission of a cultural resources reconnaissance report pertaining to the proposed Todd Lake Dam rehabilitation project. On March 15, 2011, the VDHR indicated their concurrence with the U.S. Forest Service's finding of "*no historic properties affected"* for the proposed Todd Lake dam project.

WATER QUALITY

Todd Lake is located on Skidmore Fork which confluences with North River approximately 2 miles downstream of the dam. The watershed for Todd Lake is almost entirely forested with the exception of a few meadows, a campground, and some private structures. The 2010 305(b)/303(d) Integrated Water Quality Assessment and Impaired Waters Report did not list Skidmore Fork as "impaired" (VDEQ 2010).

STREAMS, LAKES, AND WETLANDS

Skidmore Fork is a tributary to North River and has a base flow of about 4.0 cubic feet per second immediately below the dam. The stream is approximately 10 feet wide and less than two feet deep. The substrate of the streambed consists of sands and gravels. The riparian areas adjacent to Skidmore Fork and Todd Lake are predominately forested.

The Todd Lake shoreline, inlet, and outlet were visually surveyed in June 2011 for wetlands. Approximately 0.1 acres of fringe wetlands were identified along the shoreline. The 5.8 surface acres of the lake are considered to be open water wetlands. No other wetlands were identified upstream or downstream of the dam. Data found at the US Fish and Wildlife wetland mapper website: www.fws.gov/wetlands/Data/Mapper.html concurred with the field investigation.

Additional documentation regarding the methods used to make the field investigation can be found in Appendix F.

AIR QUALITY

Air quality in the area is satisfactory. Augusta County is not within a non-attainment area for ozone or particulate matter-2.5 ($PM_{2.5}$) according to the 2010 Virginia Ambient Air Monitoring Data Report.

FOREST RESOURCES

The U.S. Forest Service North River District staff completed a field vegetative survey of the project area in April and June of 2011. A summary of that survey found that oak species dominate the canopy layer. Other important species in the canopy layer include pines, maples, black gum, and tulip poplar. Common midstory vegetation includes saplings of overstory trees, witch hazel and serviceberry. Some of the most common understory species in the forested areas include seedlings of woody species, mountain laurel, greenbrier, blueberries, ferns, and mosses. The open areas contain a variety of flowers, grasses, sedges and shrubs. Many are alien or invasive species. This mixture of vegetation is typical of acidic soils developed over sandstone and shale bedrock in the Ridge and Valley portion of the Appalachian Mountains.

WILDLIFE RESOURCES

The Upper North River Watershed is considered to be part of the Blue Ridge Mountains Ecoregion according to Virginia's Comprehensive Wildlife Conservation Strategy, 2005 (VDGIF). This Strategy lists 174 Species of Greatest Conservation Need in the Blue Ridge Mountains. While completing field surveys, the U.S. Forest Service North River District staff observed many animals and animal signs commonly found in such habitats, including white-tailed deer, woodpeckers, spiders, eastern chipmunks, and many species of warblers and other songbirds. The survey found only typical aquatic animals in area streams and in Todd Lake including frogs, red-spotted newt, minnows, and leeches.

MIGRATORY BIRDS

Virginia is part of the Atlantic Flyway - the migratory path of waterfowl, shorebirds, pelagic birds, and songbirds of the North American East Coast. Each fall, the Atlantic Flyway is filled with ducks, geese, brant, swans, hawks, eagles, and other migratory birds. Waterfowl and other birds make several stops on the flyway to rest, feed and drink before continuing their southern migration. In early spring, birds follow this path northward to their traditional nesting grounds

CHESAPEAKE BAY AND COASTAL ZONE MANAGEMENT AREAS

The Upper North River Watershed eventually drains into the Potomac River, a major tributary to the Chesapeake Bay. As such, the dam rehabilitation efforts must consider impacts as required by the Chesapeake Bay Preservation Act. Augusta County has adopted local land use plans and ordinances which incorporate water quality protection measures consistent with the Chesapeake Bay Act Regulations. The Upper North River Watershed is not located within the Virginia Coastal Zone Management Area.

SOCIAL AND ECONOMIC CONDITIONS

Todd Lake has a watershed of 2,473 acres, all of which lie within the George Washington and Jefferson National Forest and Augusta County. The entire population within the watershed and below the dam resides within Augusta County.

Population and Race: According to 2010 Census of the Population from the Census Bureau for the population of the U.S., Augusta County had a total population of 73,750 (up from 65,615 in 2000 – a 12.4% increase). Of the total population, about 93.4% (68,848) were white and 4% (2,930) were Black or African American. All other racial groups individually were 0.5% of the total population or less. Together, white and blacks made up 97.3% of the county's entire population. Hispanics of any race are the second largest minority group with 2.1%, or 1,525. "Other races" combined constituted 5.4% of the Augusta County population with 3,991. Native Americans have a very small presence with only 0.2% of the population (160).

Age: The 2006-2010 Census projections from the American Community Survey indicate that the median age (middle point with ½ above and ½ below) of the population of Augusta County was 42.3 (up from 39 in 2000). The median age for the state of Virginia was somewhat lower at 37.2 years (same for the entire nation). Residents in Augusta County that were 65 years old or older totaled 15.1% (11,067). These statistics compare to 11.8% for the State and 13.1% for the nation. About 78.5% of the County population was over the age of 18. The same statistic for the state as a whole was 76.5%. Both the local and the state numbers are close to the national average estimated at 76%.

Education: Approximately 83.7% of the residents in the County had a high school education or higher while the state-wide and national percentages for this were 86.1% and 85.6% respectively. Approximately 42.1% of the residents in the county, 25 years of age or older, have a high school diploma or have passed an equivalency test. Almost 84% of the County residents have some education beyond high school, including 19.1% with a bachelor's degree or higher and 5.7% with graduate or professional degrees. An additional 17.3% in the County have completed at least some college level work with 5.1% having obtained an associate degree. All of these numbers are well above the state-wide and national averages. State-wide and nationally, 26% and 28.5% respectively, of the population 25 years of age or older, has a high school diploma or equivalency.

Employment/Unemployment, Class of Worker and Commuter Status: There are 59,367 Augusta County residents who are 16 years of age or older according to the 2006-2010 Census Bureau projections. Approximately 61% (35,911) of these people are considered in the labor force pool. About 95.4% of the civilian labor force in the County was employed according to the 2005-2009 Census projections. About 4.6% of the civilian labor force in the County was unemployed according to the same source. The unemployment figure is lower than the unemployment rate projected from the 2006-2010 estimates for the state of Virginia as a whole which was 5.9%, and for the nation, which was estimated to be 5.9% as well.

Augusta County has a diverse and productive economy. According to the 2005-2009 Census projections, five sub-sectors of the local economy employ well over 99% of the workforce: management and related professional occupations (29.4%); sales and office occupations (25.3%); production, transportation, and materials moving occupations (19.6%), service occupations (13.9%) and natural resources, construction, and maintenance occupations (11.8%). According

to the 2006-2010 American Community Survey of the U.S. Census Bureau, private wage and salary employment constitutes 77.3% of all employment in Augusta County.

Income: Median household income (householder and all others, related or not) estimated for the county for the 2006-2010 period was $50,612. This compares to $61,406 per year for the median household income calculated for the state of Virginia. The national figure for median household income per year estimated for the same period was $50,046. The median estimated household income for 2006-2010 for Augusta County was 82% of the state median and 101% of the national median household income.

Median family income (householder and all others that are related) in Augusta County for the 2006-2010 period was $60,506 compared to $48,579 per year for 2000[1]. The current figure is significantly less, approximately 82% of the $73,514 in median family income for Virginia as a whole and almost 100% of the $60,609 reported for the entire United States for 2006-2010.

With respect to per capita incomes, Augusta County residents are estimated to have had per capita incomes of $23,571 for the 2006-2010 period. Virginians reported per capita income of $32,145 for the 2006-2010 period, while the same figure for the entire United States was $26,059 for 2006-2010. That makes the county per capita income figure for 2006-2010 73% of the state's level and 90% of the national figure.

Poverty: According to the 2006-2010 Census estimates, Augusta County had 1,383 families living below the poverty level (6.8%), up from 801 families (4.2%) living below the poverty level in 2000. State-wide, 7.2% of Virginia's families had incomes below the poverty level during the 2006-2010 period, up slightly from 7% in 2000. At the national level, 11.3% of the families were estimated to live below the poverty level for the period 2006-2010, up from 9.2% in 2000.

Housing: The 2006-2010 Census estimates indicate that there were 30,768 housing units within Augusta County with 90.7% occupied with 81.3% owner-occupied and 18.7% renter-occupied. The state-wide occupancy rate for Virginia as a whole reported in the 2006-2010 estimates was 89.7% and the national figure was 86.9%. The state-wide and national rates for owner-occupancy were 68.9% and 65.4%, respectively.

A total of 80 homes (60 single family homes, 17 mobile homes and 3 modular homes) are located in the projected breach inundation zone below the dam. Most of the homes are located in or near the Town of Stokesville. Most of the residential property downstream of the dam ranges between $50,000 and $400,000 in total value with an average of about $150,000. The total value of residential property (structures and contents only, excluding land values) at risk below the dam is an estimated $36,135,000.

The normal pool area of the reservoir is approximately 5.8 acres in size. Given that it is located on U.S. Forest Service land, there aren't any private buildings that adjoin the frontage around it. However, the U.S. Forest Service has developed quite an extensive set of recreational facilities immediately above the reservoir including bathrooms, barbeque and picnic areas, camp sites, and other outdoor recreation improvements.

[1] Median family income is consistently higher than median household income. This is because the household universe includes people who live alone. Their income would typically be lower than family income because by definition, a family must have two or more people.

Recreation: Todd Lake provides recreation to campers and day visitors to the National Forest and the recreational facilities at the reservoir. It is highly valued by the local community and a source of income for the U.S. Forest Service. Lake-based recreation and other activities associated with the reservoir include camping and picnicking, boating, and bird watching.

DESCRIPTION OF EXISTING DAM

Current Condition of the Dam: A visual inspection of the dam was conducted on October 11, 2011. The dam and auxiliary spillway have been well maintained with a good stand of grass and no woody vegetation on the embankment and auxiliary spillway. No erosion was observed on either the embankment or the auxiliary spillway. The exterior of the principal spillway riser is showing signs of age-related deterioration. The camera survey of the principal spillway pipe is scheduled for summer/fall 2012. The slide gate at the base of the riser was last activated on October 11, 2011.

There is a wet area near the downstream right groin of the dam where the stability berm intersects natural ground. This area is at an elevation just below the reservoir full pool elevation. This wet area was noted multiple times in the annual inspection reports. The 2006 Gannett Fleming report suggested that this wet area was the result of seepage through the dam and recommended installation of a graded filter to collect and convey this water away from the dam. Further investigation showed that this water appears to be from a natural spring or a local ground water vent rather than anything associated with the dam. However, the spring is located in an area that is mowed during normal dam maintenance activities and the wet conditions make maintenance difficult. In 2008, NRCS designed a graded filter to collect this water and drain it away. The system allows monitoring of the water quality and volume coming from the filter. A second wet area, located outside of the footprint of the dam, was drained to prevent the collection of surface water in the mowed area. Both of these improvements were installed by the Sponsor.

Potential Dam Safety Deficiencies: After the change in hazard classification was made, the Virginia Division of Dam Safety issued a conditional use certificate for Todd Lake because, according to the Gannett-Fleming, Inc. report, the vegetated earthen auxiliary spillway does not have the capacity or integrity to pass the Probable Maximum Flood (PMF) storm flow without breaching the structure. During the evaluation process, NRCS verified this condition. NRCS further determined that the auxiliary spillway also does not meet the NRCS stability criteria for a vegetated spillway.

As-Built Dam Specifications: The dam was completed in 1963 (Figure 1). The earthfill used to construct the embankment was obtained from the permanent pool area, the auxiliary spillway excavation, and a nearby borrow pit known as the ridge pit borrow area. According to the original design report, the pool borrow area included sand with fine gravel silt clay, silty sand, and clayey sand. The soil in the ridge borrow pit was primarily silty clayey sand. The auxiliary spillway soils were silty clays-clayey silts, silty sand, and sandy silt. Some silty gravel and clayey gravel were also present.

The dam embankment is comprised of two zones of earthfill. Zone 1, the “Core” material, is clayey gravel, silty gravel, and silty clay from the ridge pit borrow area and the auxiliary spillway excavation. Zone 2, the “Shell” material which covers the crest and downstream slope, is silty gravel from the permanent pool borrow area. The top of the embankment is 19 feet wide

with 2.5 horizontal to 1 vertical side slopes on the downstream slope. A 10-foot wide stability berm is located about midway down the slope. The upstream face of the dam has a 2.5:1 side slope from the top of the dam to the wave berm. The slope is 3:1 below the elevation of the wave berm. The wave berm is 10 feet wide and is located on the upstream slope at an elevation slightly higher than the principal spillway crest.

Figure 1. The Todd Lake dam, auxiliary spillway, and pool, post-construction, July 1963.

According to the As-Built drawings, the top of dam was constructed 65 feet above the downstream toe of the embankment with an allowance of 1.0 foot of settlement for a settled height of 64 feet. The 2008 field survey shows an average dam height of 64.3 feet above the downstream toe at a nominal elevation of 1939.3 (NAVD88). The crest of the dam extends approximately 987 feet from the right abutment (looking downstream) to the auxiliary spillway. Figure 2 shows a cross-section of a dam.

Principal Spillway: The principal spillway consists of a 388-foot long, 30-inch-diameter, reinforced concrete pipe with 13 concrete anti-seep collars; a 2.5x7.5 foot (interior dimensions), 19.2 foot high, NRCS standard closed-top reinforced concrete riser with a trash rack; and a plunge pool outlet. The riser controls the normal pool with a weir, 15 feet long, at the top of the riser. A coldwater release was installed to control the temperature of the water released from the structure and to allow for an extended period of release during low flow conditions. A 30-inch-diameter circular gate at the base of the riser, operated by crank, is provided for dewatering. The conduit discharges into a plunge pool. The outlet works, including the plunge pool and downstream channel, are in good condition. Although the principal spillway riser is functioning correctly, it has begun to show some age-related concrete deterioration (Figure 3).

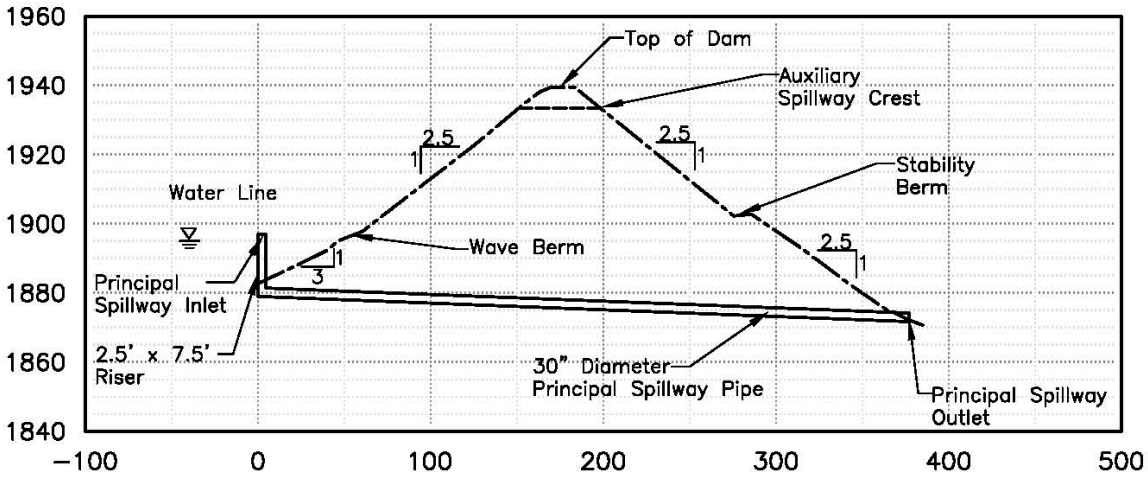

Figure 2. Cross-section of a dam.

Figure 3. Principal spillway riser at Todd Lake (October 2010).

Auxiliary Spillway: A 200-foot-wide vegetated earthen channel auxiliary spillway was constructed in the right abutment. The As-Built drawings show a 20-foot-long level control section approximately 5.3 feet below the top of dam with a 125-foot long, 2% inlet slope. The outlet has a grade of 3% for 110 feet. The vegetation lining the spillway is well maintained. The spillway outlets onto a wooded slope located directly adjacent to Forest Service Road 95. Spillway flows will pass over Forest Road 95 before entering the defined channel of Skidmore Fork. The as-built elevation of the crest was 1933.6 feet and the 2010 surveyed elevation was 1933.4 feet.

The boring logs performed by Gannett Fleming in 2006 indicate four general strata in the auxiliary spillway: topsoil composed of sandy silt; residual sandy silt and silty sand; interbedded sandstone, siltstone, and claystone; and sandstone. The soils in the auxiliary spillway do not have the integrity needed to pass the PMF through the auxiliary spillway without breaching.

Internal Drain System: At the time of construction, a rock toe drain was installed at the downstream toe of the dam.

Appurtenant Structures: A 6-inch cast iron sanitary sewer line runs through the dam embankment near the center of the dam. This part of the sewer line was installed at the time of construction at the request of the U.S. Forest Service to allow construction of sanitary facilities at the campground that was established after the dam was complete. The part of the sewer line shown in Figure 4 was installed by the U.S. Forest Service. The sewer line drains into a septic system and drain field below the dam. This will be camera-surveyed at the time of the principal spillway survey.

In 1977, the U.S. Forest Service increased the size of the swimming area by placing a rock embankment in the permanent pool area and backfilling the area with approximately two acre-feet of sand (Figure 5). This was done to establish a constant water depth of four feet.

Figure 4. Sewer line observed when lake is drained.

Figure 5. Beach in front of campground.

Precipitation Data: The dam was designed using criteria in Technical Paper 10, and on precipitation data based on Technical Paper 29. Current data is contained in NOAA Atlas14, *Precipitation Frequency Atlas for the United States, Volume 2 – The Ohio River Basin and Surrounding States* (2004) and in NOAA *Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States East of the 105th Meridian* (June 1978). As shown in Table C, the current data is slightly different than that used for design of the dam. The existing principal spillway has adequate capacity to meet current NRCS criteria. However, the auxiliary spillway does not have the capacity to meet the requirements of the new hazard class.

Table C. Comparison of Precipitation Data

Event	Precipitation (inches)	
	Design (Significant Hazard)	**Current (High Hazard)**
100-year, 24-hour	6.8	6.95
100-year, 10-day	14.1	10.3
Auxiliary Spillway Hydrograph	13.99	10.47
Freeboard Hydrograph	19.58	28.0

Sedimentation: Todd Lake was designed to store 50 years of sediment in the pool area. The designed submerged sediment storage capacity was 56 acre-feet at a planned sediment

accumulation rate of 1.12 acre-feet per year. Based upon the sediment survey, the actual sediment storage capacity was 57.7 acre-feet and the volume of submerged sediment in the pool in 2010 was 9.1 acre-feet. The sedimentation rate for this time period was 0.19 acre-feet per year. The land use within the watershed has not changed since the dam was constructed. The national Land Cover Dataset shows 2,421.5 acres out of a total watershed of 2,473 acres (98%) to be forest (woodland). The future sedimentation rate is projected to be the same as the historic rate. Based upon the surveyed submerged sediment capacity and the existing volume of stored sediment, there were 48.6 acre-feet of storage remaining in the reservoir in 2010. At that time, there were 255 years of submerged sediment life remaining. Figure 6 shows the process for gathering the data used to estimate sediment deposition.

There were 15 acre-feet of aerated sediment storage planned. Aerated sediment is sediment that is deposited above the normal pool during high flows. The designed deposition rate for the aerated sediment was 0.3 acre-feet per year. The estimated volume of aerated sediment in the pool in 2010 was 1.0 acre-feet. The available aerated sediment storage capacity is 14.0 acre-feet. Based upon the historic accumulation rate of 0.02 acre-feet per year, there is more than adequate room for 50 more years of aerated sediment deposition.

The measured sediment accumulation is much lower than what was originally estimated for Todd Lake during the planning process. There are two possible reasons for this difference. First, the sediment accumulation rate calculated during the design of the structure was too conservative and required a sediment pool much larger than needed. Second, the U.S. Forest Service drains Todd Lake approximately every other winter (Figure 7). Each time the lake is drained, the stream (Skidmore Fork) re-establishes a channel through the collected sediment in the pool. (See Figure B3 in Appendix B.) That action probably flushes some volume of sediment from the pool but there have been no complaints of excess sediment in the stream channel downstream. These two factors have no adverse effect on the function of the dam.

Figure 6. Sediment survey, in progress.

Figure 7. Todd Lake, drained in the winter of 2012.

DESCRIPTION OF HOW A DAM FUNCTIONS

The main components of a flood control dam are the embankment or dam; the normal or sediment pool; the floodpool; the principal spillway; and the auxiliary spillway. The principal spillway controls the day-to-day elevation of the water in the lake and it provides a controlled release of the water in the floodpool. The floodpool, which is the floodwater storage area between the principal spillway crest and the auxiliary spillway crest, is designed to detain the water that would accumulate behind the dam in events equal to or smaller than the 100-year storm event. This storm is the event that has a one percent chance of occurring in any given year. In a bigger storm event, the water level will be higher than the crest of the auxiliary spillway and the excess water will pass around the dam through the auxiliary spillway.

Sediment pool. The reservoir is designed to store sediment in the area below the elevation of the principal spillway inlet and to detain floodwater in the area between the principal spillway inlet and the crest of the auxiliary spillway. After the dam is completed, water accumulates below the crest of the principal spillway riser to create a lake. As the lake fills with sediment, the amount of water in the lake decreases. When the sediment pool has filled to the elevation of the principal spillway inlet, the pool no longer has permanent water storage, but the designed floodwater detention storage is still intact. If the actual sedimentation rate is greater than the designed sedimentation rate, the sediment storage area will be filled before the design life of the structure has been reached. The additional sediment would begin to fill the floodwater detention area above the principal spillway and reduce the available flood storage. Initially, sediment delivered to the reservoir would pass directly through the principal spillway orifice. Eventually, this orifice would be blocked by debris and sediment, and water would be impounded to the elevation of the auxiliary spillway.

As the flood pool loses storage due to sediment deposition, the auxiliary spillway operates, or has flowage, more often. For a vegetated earthen auxiliary spillway, repeated flows could erode the soil material and eventually cause the spillway to breach.

Principal spillway: A principal spillway has three main parts: the riser, the pipe, and the outlet. The riser is typically a concrete tower that controls the level of water in the lake. The elevation of the water is determined by the amount of sediment that has to be stored over the life of the dam. Most risers have a drain gate at the bottom of the riser that allows the lake to be completely drained. Water goes into the top of the riser and drops to the bottom before exiting through the principal spillway pipe. This pipe conveys water through the dam safely. The water exits into an outlet structure, typically called a stilling basin. Its purpose is to slow the velocity of the water leaving the pipe so it doesn't cause erosion in the stream channel.

Auxiliary spillway: There are four parts of an auxiliary spillway. The inlet section is on the side closest to the lake. It has a gentle upward slope toward the middle of the auxiliary spillway. The water that reaches the inlet section has little or no velocity and, therefore, does not cause erosion to occur. The level center section is called the control section. The control section is usually located where the auxiliary spillway crosses the centerline of the top of the dam. The purpose of the control section is to make the water in the auxiliary spillway spread out evenly rather than concentrate into little channels. The third section is called the constructed outlet. Its purpose to keep the water flowing out of the auxiliary spillway in a controlled manner until the water gets far enough away that it will not cause erosion on the dam itself. Once this point is reached, the water is free to go on downstream. The fourth component of an auxiliary spillway is the training dikes. Training dikes are used in conjunction with the outlet section to direct the flow of the water away from the back side of the dam embankment. Training dikes can also be used in the inlet section to direct water into the auxiliary spillway.

A breach in a vegetated earthen auxiliary spillway typically begins when the vegetation in the area downstream of the outlet section of the auxiliary spillway is eroded away by the force of the water flowing through it. The soil is exposed and also begins to erode away. A gully forms in each location where water is concentrated. The gully will erode downward first and then begin to widen as the water goes downstream. Gully formation doesn't just occur in the downstream direction. The little drop-off in the soil surface that was created at the upstream edge of the gully when it started is called a headcut. As more soil is eroded from the edge of the headcut, the upstream edge of the gully will migrate toward the source of the water. This widening and deepening process continues until it reaches the inlet section of the auxiliary spillway. The dam is considered to be breached at this point. Erosion will continue to occur until all of the water stored behind the dam has been released downstream or until a hard rock layer is reached.

STATUS OF OPERATION AND MAINTENANCE

Operation and maintenance of the structure is the responsibility of the Headwaters Soil and Water Conservation District and they have done an excellent job of operating and maintaining this structure. Recent records indicate that the operation and maintenance of the structure has been kept current for the site. This has been verified through site assessments. The most recent inspection was conducted October 11, 2011.

The U.S. Forest Service raises and lowers the lake in order to facilitate maintenance of the beach and the sewer line. This occurs approximately every two years.

STRUCTURAL DATA

The structural data for the as-built condition of the dam and watershed is described in Table D. The sediment data is based upon the 2010 sediment survey.

Table D – As-Built and Existing Structural Data for Todd Lake

	As-Built	Existing
Local Name	Todd Lake	
Site Number	10	
Year Completed	1963	
Cost	$127,690	
Purpose	Flood control	
Drainage Area, mi^2	4.07	3.86
Dam Height, feet	64.0	
Dam Type	Earthen	
Dam Volume, yds^3	237,200	
Dam Crest Length, ft	987	
Storage Capacity, ac-ft	759	750.6
Submerged Sediment, ac-ft	56	48.6
Aerated Sediment, ac-ft	15	14
Flood Storage, ac-ft	688	688
Principal Spillway		
Type	Concrete	
Riser Height, ft	19.2	
Conduit Size, inches	30	
Stages, no.	1	
Capacity, cfs	146.4	
Energy Dissipater	Plunge Pool	
Auxiliary Spillway		
Type	Earthen	
Width, ft	200	
Capacity, % of PMF	~50	
Normal Pool Elev.	1895.6	1895.0
Flood Pool Elev.	1933.6	1933.4
Top of Dam Elev.	1938.9	1938.9
Datum	NGVD29	NAVD88

BREACH ANALYSIS AND HAZARD CLASSIFICATION

Breach Analysis: To determine the downstream inundation zones due to a dam breach, a breach analysis was performed using a sunny day breach with the water level at the existing auxiliary spillway crest and following the peak breach discharge criteria in Technical Release No. 60, Earth Dams and Reservoirs (TR-60).

The maximum breach discharge of 70,200 cfs was computed using the criteria in TR-60. The depth of water at failure is about 55 feet.

The computer models HEC-HMS and HEC-RAS (steady flow) were used to determine the inundation zone due to the breach of the dam. Results of the breach analyses are shown in Appendix C in Table C2 and on the Breach Inundation Map.

The analysis was performed from the dam downstream on Skidmore Fork and North River to the Augusta and Rockingham County line, more than eleven miles downstream of the dam. The breach analysis terminates eleven miles downstream of the dam, where the flow from the breach would be within the 100-year floodplain.

The breach inundation zone analysis will be used by the Sponsors to update the Emergency Action Plan (EAP) that currently exists for the dam. The purpose of an EAP is to outline appropriate actions and to designate parties responsible for those actions in the event of a potential failure of the dam. The Sponsors will update the EAP annually with assistance from local emergency response officials. As resources allow, NRCS will provide technical assistance with updating the EAP. The NRCS State Conservationist will ensure that a current EAP is prepared prior to initiation of construction.

Hazard Classification: Todd Lake was originally constructed in 1963 for the purpose of protecting downstream lands from flooding. It was designed as a SCS class (b) (significant hazard) structure with a 50-year design life. The hazard class of the structure was changed to high because failure may cause loss of life and serious infrastructure damage. The NRCS State Conservation Engineer concurs with this classification.

In Virginia, State dam safety regulations require that a high hazard dam must be able to safely pass the volume of water associated with the PMF without overtopping. The Virginia Division of Dam Safety definition of the PMF is “the flood that might be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.” NRCS is required to use the criteria established in NRCS Technical Release 60 (TR-60) to prepare rehabilitation designs. Under these criteria, the Probable Maximum Precipitation (PMP) is used to define the design requirements rather than the Probable Maximum Flood used by the State of Virginia. Since the Probable Maximum Flood is the result of the Probable Maximum Precipitation, the NRCS criteria meet the State criteria.

EVALUATION OF POTENTIAL FAILURE MODES

Dams are built for the conditions that existed or could reasonably be anticipated during the time of design. Sometimes these conditions change, resulting in dam failure. Several potential modes of failure were evaluated for Todd Lake.

Sedimentation: The land use in the watershed above the dam is 97.93% Forest, 1.72% Open Space, 0.11% Hay/Pasture, and 0.24% Water. Since most of the watershed is in the George

Washington and Jefferson National Forest, these uses are not expected to change significantly. Also, the management of the lake is not expected to change. Unless there is a catastrophic event, such as a wildfire, the future sediment accumulation rate in Todd Lake is expected to be the same as the historic rate. Based upon the future sediment deposition rate of 0.19 acre-feet per year, the remaining sediment storage life of Todd Lake in 2010 was 255 years. Therefore, the potential for failure due to inadequate capacity is low.

Hydrologic Capacity: Hydrologic failure of a dam can occur by breaching the auxiliary spillway or by overtopping and breaching the dam. Under present NRCS criteria for high hazard dams, the auxiliary spillway must have sufficient capacity, stability, and integrity to pass the full PMF event without breaching the spillway or overtopping the dam. The auxiliary spillway at Todd Lake does not have sufficient capacity. The integrity and stability of the auxiliary spillway and dam embankment are dependent on the depth, velocity, and duration of the flow, the vegetative cover, and the resistance of the soil in the auxiliary spillway and dam embankment to erosion. During the 6-hour PMP event, the auxiliary spillway would fail due to the lack of integrity of the underlying materials. The overall potential for hydrologic failure of Todd Lake is considered to be high because it cannot pass the PMF without breaching the auxiliary spillway.

Seepage: Embankment and foundation seepage can contribute to failure of an embankment by removing (piping) soil material through the embankment or foundation. As the soil material is removed, the voids created allow even more water flow through the embankment or foundation, until the dam collapses due to the internal erosion. Seepage that increases with a rise in pool elevation is an indication of a potential problem, as is stained or muddy water or "sand boils" (the up-welling of sediment transported by water through voided areas). Foundation and embankment drainage systems can alleviate the seepage problem by removing the water without allowing soil particles to be transported away from the dam. There are no signs of seepage at Todd Lake. The potential for a seepage failure of Todd Lake is considered to be low.

Seismic: The integrity and stability of an earthen embankment are dependent upon the presence of a stable foundation. Foundation movement through consolidation, compression, or lateral movement can cause the creation of voids within an embankment, separation of the principal spillway conduit joints, or in extreme cases, complete collapse of the embankment. The Upper North River watershed is not located within an area of significant seismic risk; therefore, there is low potential for seismic activity to cause failure of the dam embankment.

Material Deterioration: The materials used in the principal spillway system, the sanitary sewer line, the embankment drains, and the pool drainage system are subject to weathering and chemical reactions due to natural elements within the soil, water, and atmosphere. Concrete risers and conduits can deteriorate and crack, metal components can rust and corrode, and leaks can develop. Embankment failure can occur from internal erosion caused by these leaks. The camera survey of the principal spillway pipe and sanitary sewer pipe will be conducted in the summer/fall of 2012. At that time, any noted problems will be addressed.

There has been some deterioration in the concrete in the principal spillway riser due to age. The Todd Lake dam is considered to have a high potential to fail due to deterioration of the principal spillway riser. This type of failure could result in a loss of reservoir storage due to release of water. Alternately, if the principal spillway outlet is blocked due to component failure, the reservoir would fill to the crest of the auxiliary spillway. There would be no stormwater

detention capacity and failure could occur as a result of repeated flowage in the auxiliary spillway.

Conclusion: At the present time, the Todd Lake dam has the potential to fail due to a lack of hydrologic capacity since the soils in the auxiliary spillway do not have the structural integrity necessary to pass the required storm event and the capacity of the auxiliary spillway is inadequate. It also has the potential to fail due to material deterioration of the principal spillway system. These types of failure could occur at any time during the remaining life of the structure. There is adequate sediment capacity, there are no signs of seepage and the site has minimal risk for failure due to seismic activity.

CONSEQUENCES OF DAM FAILURE BY A SUNNY DAY BREACH

For the purposes of preparing the Emergency Action Plan, a worst-case scenario is assumed in the analysis of a possible dam failure. This scenario assumes a sunny day breach with water at the crest of the auxiliary spillway and with no advance warning. It is assumed that structural collapse would occur quickly and result in a release of 750 acre-feet of water and sediment, beginning with a wall of water that is 55 feet high.

The population at risk is approximately 442 people. The properties and infrastructure potentially affected by a breach of the Todd Lake Dam includes 80 homes, five business structures at two businesses, 28 recreational structures (Camp May Flather), 1 club structure, 1 trash collection site, 1 steel truss bridge, 1 concrete deck bridge, and several culverts at two road crossings. Approximately 2.4 miles of U.S. Forest Service Rd. 95 and associated culverts and 9.6 miles of several state roads would be impacted by scour erosion damage.

Flows from a breach of Todd Lake would pass through the communities of Stokesville and Mount Solon but would be within the 100-year floodplain of the North River before reaching the Augusta/Rockingham county line. Traffic counts from the Virginia Department of Transportation (VDOT) indicate that an additional exposure to loss of life could occur as a result of the vehicles on 14 different state roads and 11 private roads. Average Daily Traffic (ADT) varies on these state roads from 190 to 920 vehicles per day. The utilities associated with the transportation routes could also be destroyed.

A breach event would cause significant economic damages to the homes, business structures, roads and bridges below the dam. In addition, loss of some business activity, and the loss of the lake with corresponding decreases in recreational opportunities, would also occur. The residences and business properties at risk in the area of the floodplain subject to a breach of Todd Lake have structure and content values estimated at $36,135,000. In addition, the potentially impacted bridge and culvert infrastructure is valued at $1,360,000. A catastrophic breach would result in an estimated $2,635,000 in economic damages to existing buildings and their contents.

Other economic damages from a catastrophic breach would be associated public and private clean-up costs, damages to vehicles, lost recreation opportunities with the lake gone, and increased flood damages in the future for remaining properties due to the absence of the dam and its flood protection effects. A catastrophic breach of the Todd Lake dam would result in a total estimated $3,810,000 in damages.

The environmental damages from a dam failure would be significant. In addition to the damage caused by the water, the sediment stored in the pool area would be flushed downstream in the

event of a catastrophic breach. Approximately eleven miles of stream channel downstream of the dam would be damaged by scouring or deposition. Sediment would be deposited in the floodplain. This would constrict the floodplain and cause additional flooding in subsequent storm events. Deposition of sediment in the floodplain would also restrict normal use of the land which may cause water quality problems in the future. It is unlikely that a catastrophic breach would remove all of the fill material used to build the dam. The embankment material remaining after a breach would also eventually erode into the stream, contributing to the downstream sediment deposition. Over time, the sediment could migrate downstream from the North River into the Shenandoah River and then into the Potomac River.

There is also a potential for stream degradation upstream from the dam site. The abrupt removal of the water and sediment would cause instability in the stream feeding the reservoir. This channel could develop headcuts that would migrate upstream. If a bedrock ledge or other hardened point is encountered in the stream, the headcut would stop proceeding upstream. Downcutting and widening would continue to occur in the lake bed.

FORMULATION AND COMPARISON OF ALTERNATIVES

The stated objectives of the Sponsors for the Todd Lake Rehabilitation Plan are: 1) to bring the Todd Lake dam into compliance with current dam safety and design criteria; 2) to maintain the current level of flood protection provided by Todd Lake; and 3) to address the local residents' concerns. These objectives can be met by installing measures which will bring the dam into compliance with State and Federal regulations. Under the Watershed Rehabilitation Provisions of the Watershed Protection and Flood Prevention Act, NRCS is required to consider the technical, social, and economic feasibility of the locally preferred solution and other alternatives identified through the planning process.

FORMULATION PROCESS

Formulation of alternative rehabilitation plans for Todd Lake followed procedures outlined in the NRCS *National Watershed Program Manual*. Other guidance incorporated into the formulation process included the NRCS *National Planning Procedures Handbook, Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G)*, and other NRCS watershed planning policies. Each alternative evaluated in detail used a 52-year period of analysis, which includes a two year design and installation period and 50 years of expected useful life. It is anticipated that the dam will continue to be in service after that time with proper maintenance.

The formulation process began with formal discussions between the Sponsors, the Virginia Division of Dam Safety, and NRCS. The Virginia Division of Dam Safety conveyed state law and policy associated with a high hazard dam. NRCS explained agency policy associated with the Small Watershed Dam Rehabilitation Program and related alternative plans of action. As a result, alternative plans of action were developed based on NRCS planning requirements and the ability of the alternatives to address the initial objective of bringing Todd Lake into compliance with current dam safety and design criteria. The National Economic Development (NED)

Alternative is the federally assisted alternative with the greatest net economic benefits. The alternative plans that must be considered include:

- No Federal Action
- Decommission the Dam
- Non-Structural – Relocate or Floodproof Structures in the Breach Zone
- Rehabilitate the Dam
- National Economic Development (NED) Alternative

ISSUES THAT MUST BE CONSIDERED IN EVALUATION OF ALTERNATIVES

Issue 1. Prevent a Breach of the Auxiliary Spillway From Loss of Integrity: There are three main techniques for preventing an auxiliary spillway from breaching due to loss of integrity. For a vegetated earthen spillway, the control section can be lengthened and/or widened to decrease the velocity of the water flowing in the auxiliary spillway. Although erosion would occur during an auxiliary flow event, there would be enough soil material in the control section that the flow event would be completed before the breach could occur. Another solution is to armor the spillway surface to limit the extent of the soil erosion and prevent gullies from occurring. Example of armoring methods include Articulated Concrete Blocks, Roller-compacted Concrete, or a concrete baffle chute. A third method would be to install a cutoff wall that would be buried in the auxiliary spillway to keep headcuts from migrating upstream through the control section. This method would not prevent soil erosion or gully formation downstream of the cutoff wall. Many combinations or variations of these solutions are possible.

Issue 2. Ensure auxiliary spillway capacity: The capacity of the auxiliary spillway must be sufficient to pass the entire volume of the PMF event. One solution is to raise the top of the dam. Another solution is to widen the auxiliary spillway. The third option is a combination of raising and widening. Lowering the crest of the auxiliary spillway is an option for increasing capacity but was not considered for this site because it would decrease the available flood protection.

The site-specific solutions to achieve auxiliary spillway integrity and capacity are addressed in the section on Description of Alternative Plans Considered.

Issue 3. Replace the riser of the principal spillway: The concrete in the existing principal spillway riser has deteriorated over time. As part of the rehabilitation of this dam, the riser will be completely removed and replaced. The water control gate at the base of the riser will also be replaced so that all the material components of the riser would have the same planned life. Implementation of the riser replacement will require draining the lake for up to six months.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Some of the alternatives considered in the planning process were eliminated from detailed consideration because these alternatives either did not meet the proposed purpose or need for federal action or they were logistically impractical to implement.

Decommission Dam by Completely Removing the Embankment: This option describes an alternative which includes removing the flood detention capacity of the dam by removing the existing embankment down to the valley floor. Decommissioning is a mandatory alternative that

must be considered under NRCS policy for dam rehabilitation. If the dam is removed, the 82 homes and businesses in the breach zone will no longer be at risk from flooding caused by a breach of Todd Lake. The estimated cost of completely removing the dam and all appurtenant structures is $4,505,000. When the cost of mitigation is added, the total cost of this alternative is $7,830,000. This alternative was not fully developed because partial removal of the dam will achieve the same results at a substantially lower cost. Further discussion of the anticipated damages and mitigation costs is located in the section on *Decommission Dam by Partial Removal of the Embankment and Mitigation of Induced Damages*.

Complete removal of the dam embankment would require removal of about 237,200 cubic yards of material. About 15 acres of trees would be planted over the dam, pool, and spoil site. The submerged and aerated sediment (~62,900 cubic yards) would be stabilized or removed. The function and stability of approximately 1,000 feet of stream channel would be restored and 5.8 acres of normal pool area would be planted to a forested buffer to match the adjacent floodplain. The removal of the principal spillway riser and pipe would also be necessary. These unneeded materials could be buried or hauled to an appropriate disposal site. Table E lists some of the major components of completely decommissioning the dam.

Table E – Major Components of Decommissioning the Dam by Completely Removing the Embankment

Items of Work	Quantities	Unit cost	Cost
Fill removal and disposal	237,200 CY	$8/CY	$1,897,600
Spoil Spreading	237,200 CY	$3.90/CY	$925,080
Topsoil Spreading	169,400 SY	$1.13	$191,422
Channel Restoration and Reforestation	Lump Sum	$240,000	$240,000
Pollution Control	Lump Sum	$208,000	$208,000
Seeding and Mulching	15 Acres	$3,500/acre	$142,500
Cost of structure removal only*			$4,505,000

* Other costs would include mitigation for induced damages ($2,900,000), floodproofing of bridges and utilities, loss of recreation, and reduced property values.

Decommission Todd Lake and Recover Lost Flood Control by Modification of Another Dam in the Upper North River Watershed: There are three flood control dams in the Upper North River watershed. The proposed alternative is to decommission Todd Lake and add enough additional flood control to Elkhorn Lake or Hearthstone Lake to account for the amount lost at Todd Lake. The selected lake would detain the additional water and release it at a rate equivalent to the current combined release of the two lakes. Under this alternative, the water surface elevations in Stokesville would not change for the 100-year storm event.

This alternative is technically feasible but was not developed in detail for several reasons. First, in the absence of a watershed-wide plan, changes to one structure cannot be dependent upon changes to another structure. Second, increasing the flood storage at Elkhorn Lake or Hearthstone Lake is likely to require a major change to one or more structural components of the dam. A major change to any of the components would trigger a need to bring the whole structure into compliance with current design requirements. The cost of rehabilitation of a

second dam plus the cost of removing the Todd Lake dam would be exorbitant. Third, it is likely that increasing the flood control capacity of the Elkhorn Lake or Hearthstone Lake dam would require increasing the size of the dam. This would result in a corresponding increase in the potential breach zone of the dam and there would be impacts to larger numbers of residences and businesses in the event of a breach. This would increase the level of risk to achieve the same amount of flood control as presently in place.

Non-Structural - Relocation or Floodproof Structures: Elevating, floodproofing, or relocating the 80 homes and two businesses in the breach zone of the dam would cost in excess of $8,000,000 and will not change the need for rehabilitation of the dam. Rehabilitation of the dam to eliminate the potential for a breach will protect these homes and businesses.

DESCRIPTION OF ALTERNATIVE PLANS CONSIDERED

Alternatives without Federal Assistance

One of the alternatives that must be included in the plan is the alternative that describes the action that the sponsors will take if no federal funds are expended. Since the Todd Lake Dam is a high hazard dam that does not meet current safety and performance standards, it is considered to be "unsafe." The Virginia Division of Dam Safety has issued a conditional certificate of operation for the dam. It is reasonable and prudent to expect that the Virginia Division of Dam Safety will soon issue an Administrative Order requiring the Sponsors to bring the dam up to State standards by rehabilitation of the dam or remove the hazard by removing the storage function of the reservoir. The Sponsors would be totally responsible for the cost of rehabilitation or removal of the dam. NRCS would still have the technical responsibility of approving the Sponsors' solution because the floodwater retarding structure is under a Project Agreement and an Operation & Maintenance Agreement between the local Sponsors and NRCS until 2013.

At the present time, the potential for an uncontrolled breach and resulting damages is present and will continue until the existing dam safety issues are addressed and resolved.

Without NRCS assistance, the Sponsors would have the following options:

- Hire a consultant, prepare plans to meet the State of Virginia and NRCS standards, and rehabilitate the dam using their own resources.
- Do nothing. In this case, the Virginia Division of Dam Safety may choose to breach the dam and send the Sponsors the bill. This option is likely to be more expensive than if the Sponsors performed the breach. The end results would be the same as those for the next option. This option would not meet the Sponsors' goal of maintaining the existing level of flood protection.
- The Sponsors could remove the flood storage capacity of the dam by breaching the dam using a least cost method. This breach would be a minimum size hole in the dam from the top of the dam to the valley floor, which would eliminate the structure's ability to store water. Downstream flooding conditions would be similar to those that existed prior to the construction of the dam. The sediment would not be stabilized and would migrate downstream. This course of action would minimize the Sponsors' dam safety liability but would not eliminate all liability since it would induce flooding downstream. This option would not meet the Sponsors' goal of maintaining existing levels of flood control.

No Federal Action (Sponsor's Rehabilitation): In the absence of federal assistance, the Sponsors have indicated that they will rehabilitate the dam to meet the required dam safety and design criteria at their own expense using the alternative proposed by NRCS. For the purposes of this evaluation, the Sponsors' Rehabilitation will be the same as the No Federal Action alternative. The estimated total cost would be $5,415,000.

The O&M agreement for this dam will expire in 2013. After that time, the federal interest in the project will be ended. Instead of the rehabilitation solution recommended by NRCS, the Sponsors may choose to use the solution of partial decommissioning but they would not be required to do all the mitigation. Excluding costs to mitigate for induced damages, a partial decommission by the Sponsors would cost approximately $1,760,000 for design, permitting, construction, and project administration. The entire cost of decommissioning would be borne by the Sponsors. There would likely be issues with liability associated with this option unless mitigation of induced flooding was included as a project element.

Alternatives with Federal Assistance

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: This option describes an alternative which includes eliminating the flood detention capacity of the dam by removing enough of the existing embankment to allow safe, non-erosive passage of the 100-year flood flow at the dam site. If the dam is removed, the 80 homes and five business structures (for two businesses) in the breach zone will no longer be at risk from flooding caused by a breach of Todd Lake. The estimated design and construction cost for partially removing the dam and completely removing the appurtenant structures is $1,713,000. When the cost of mitigation, technical assistance, and project administration is added, the total cost of this alternative is $4,760,000.

At the present time, there are an estimated 29 homes and two businesses located within the 100-year floodplain. Due to the shape of the floodplain downstream of the dam, there would be little change in the horizontal extent of the floodplain if the dam was decommissioned. One additional home and one added business structure would be in the new 100-year floodplain. However, there would be an increase in the flood depths within these homes and business facilities. The average water depth at the 100-year flood event would increase from 1.6 feet to 1.95 feet, or about 4.2 inches. Flood depths associated with the 100-year floodplain range from less than one foot to a little over 5 feet.

Federal policy requires that induced damages be mitigated so that there would be no increase in the amount of damaged sustained during a 100-year flood event. The downstream bridges and utilities would have to be protected.

Possible types of mitigation activities include floodproofing or elevation of homes, or relocation of buildings. For the purposes of this report, houses with water depths less than one foot (approximately 20) would be treated with floodproofing, houses with one to four feet of water depth (an estimated eight) would be treated with elevation, and properties with greater than four feet of water depth (one) would be bought out.

Partial removal of the dam embankment would require removal of about 89,500 cubic yards of material. About 15 acres of trees would be planted over the dam, pool, and spoil site. The sediment would be stabilized or removed. The function and stability of approximately 1,000 feet

of stream channel would be restored and 5.8 acres of normal pool area would be planted to a forested buffer to match the adjacent floodplain. The removal of the principal spillway riser and pipe would also be necessary. These unneeded materials could be buried or hauled to an appropriate disposal site. Table F lists some of the components of decommissioning the dam.

If the dam is decommissioned using federal funds, it will be necessary to extend the Operation and Maintenance Agreement for the same 50 years as needed for a dam rehabilitation. Operation and maintenance activities would include maintenance of the new stream channel and ensuring the success of the vegetation. The Sponsors would also be responsible for obtaining a Special Use Permit from the U.S. Forest Service that would extend for the project life. The O&M costs are anticipated to be about $500/year for the first 10 years due vegetation establishment. After that time, there may be some occasional cost for stream channel stabilization.

Table F – Major Components of Decommissioning the Dam by Partial Removal of the Dam Embankment

Items of Work	Quantities	Unit cost	Cost
Fill removal and disposal	89,500 CY	$5.70/CY	$510,000
Spoil Spreading	89,500 CY	$3.90/CY	$349,050
Topsoil Spreading	72,600 SY	$1.13	$82,038
Channel Restoration and Reforestation	Lump Sum	$160,000	$160,000
Pollution Control	Lump Sum	$73,000	$73,000
Seeding and Mulching	15 Acres	$3,500/acre	$142,500
Cost of structure removal only*			$1,563,000

* Other costs would include mitigation for induced damages ($2,900,000), floodproofing of bridges and utilities, loss of recreation, and reduced property values.

Rehabilitation Alternative 1. Install a Secant Pile Wall and ACB Armor and Raise the Top of Dam by 5.5 Feet: Widen the auxiliary spillway from 200 feet to 220 feet and increase the length of the control section from 20 feet to 50 feet. Since the existing auxiliary spillway is located immediately adjacent to the road that provides access to the campground and the private lands behind the lake, the auxiliary spillway would be widened in the direction of the dam embankment. The inlet section would have a slope of approximately 4% for 36 feet and 4.4% for an additional 50 feet. The crest elevation would be raised to 1933.6 to match the as-built condition. The constructed outlet section would have a slope of 3% for about 87 feet. See the plan view map in Appendix D.

Install a concrete cutoff wall made of secant piles at the downstream edge of the control section to provide the needed integrity of the auxiliary spillway. A secant pile wall is created by drilling a series of overlapping columns that are filled with concrete and reinforced with rebar cages (Figure 8). These 36-inch wide diameter columns would be 42 feet deep and imbedded into the sandstone underneath the auxiliary spillway.

The control section and outlet section would be armored by installation of Articulated Concrete Blocks (ACBs) to attain the needed measure of stability against surface erosion. The ACBs are individually constructed concrete blocks that are cabled together to form a continuous erosion-

resistant mattress. The proposed blocks are "open cell" which provides about 20% open space within and around the block. Geotextile fabric and six inches of gravel would be placed on the prepared subgrade to provide permeability and filtration while providing soil retention. The ACB mattress would then be set over the geotextile fabric (Figure 9). Six inches of topsoil placed in and around the blocks would allow more extensive vegetation of the site and would conceal the armoring and the top of the secant pile wall. The auxiliary spillway would look very similar to the way it does now. The ACBs are manufactured offsite and trucked in for installation which reduces the amount of space needed for a staging area. The cost of the secant pile wall and the ACB armor includes the cost of design by a consultant and the cost of replacement of the principal spillway riser. During the PMF event, the ACBs and underlying soils in the outlet section would be lost due to headcutting. Approximately 10,000 square feet of ACBs and 15,000 cubic yards of soil material would have to be replaced to return the site to the as-built condition. The estimated cost of these repairs is $450,000.

Figure 8. Installation of secant pile wall.

Alternative 1A: Structural Rehabilitation with Federal Assistance – Secant Pile Wall, ACB Armor, Raise Top of Dam by 5.5 Feet with a Concrete Parapet Wall: To achieve the needed capacity in the auxiliary spillway, the dam would be raised 5.5 feet by installation of a concrete parapet wall. A parapet wall is a "T" shaped piece of concrete that is embedded into the top of the dam (Figure 10). The part that would be seen would be one foot wide and 960 feet long. Annual maintenance of a parapet wall is more expensive than for an earthen structure since the area around the wall must be mowed by hand and there is greater potential for vandalism due to proximity to the campground. The annual maintenance cost is estimated to be $2,000. The estimated cost of raising the dam is $1,527,000. The total construction cost of this alternative would be $4,885,000 and includes the cost of replacing the principal spillway riser. The total project cost would be $5,419,000.

Figure 9. Installation of ACBs.

Figure 10. Parapet wall on top of a dam.

Alternative 1B: Structural Rehabilitation with Federal Assistance – Secant Pile Wall, ACB Armor, Raise Top of Dam by 5.5 Feet with Earthfill: If the top of the dam is raised by adding earth material to the existing structure, the dam would look almost exactly as it does now and there would be no change in the maintenance needs. To maintain the existing side slopes, earthfill would be added to both the upstream and downstream sides of the dam. Borrow material would be obtained from the original borrow pits, to the extent possible. The whole structure would be restored to grass upon completion. When the earthfill material is added to the upstream face of the dam, the surface area of the lake would be reduced to 5.6 acres. This is a reduction of 0.2 acres. The submerged sediment storage capacity would be reduced from 48.6 ac-ft to 40 ac-ft. The sediment life of the structure would be 210 years. There would be no change in the aerated sediment storage capacity. The floodwater storage capacity would decrease by about 1%. The annual maintenance cost is estimated to be $2,000. The estimated cost of raising the dam is $1,523,000. The total construction cost of this alternative would be $4,881,000 and includes the cost of replacing the principal spillway riser. The total project cost would be $5,415,000.

Alternative 2 – Structural Rehabilitation with Federal Assistance –Roller-Compacted Concrete Chute Spillway: For this alternative, the existing auxiliary spillway would be replaced with an Roller-compacted Concrete (RCC) chute spillway located in the center of the dam. The chute spillway would start with a 400-foot wide control section along the centerline of the dam and would have a series of large steps, approximately two feet wide, going down the downstream side of the dam. The steps would end at a stilling basin at the valley floor elevation. The stilling basin would extend downstream for 90 feet and end with a small series of steps. This section slows the velocity of the water exiting the steps and allows it to be released at a non-erosive rate. Figure 11 shows an RCC structure on the White Oak Dam site in Madison County.

The existing auxiliary spillway would be filled with earth and revegetated. There would be no change to the top of dam elevation because the width of the chute spillway would be sufficient to allow passage of the PMF without a change in dam height.

Roller-Compacted Concrete is a non-reinforced concrete that is durable and easy to install. However, RCC has a very limited window of installation time. Each batch of concrete must be placed within a time window of less than an hour. This would necessitate installation of a portable concrete mixing plant on site.

Maintenance of an RCC structure would be more complicated than that for an earthen structure because of the need to hand-mow the area adjacent to the concrete. Also, there may be some potential for vandalism due to the proximity to the campground. However, the structure should have little or no damage during passage of the PMF event. The annual maintenance cost is estimated to be $750. The estimated cost of this alternative is $7,350,000 and includes the cost of replacing the principal spillway riser.

Figure 11. The RCC auxiliary spillway at White Oak dam, Madison County.

Construction Area and Construction Access. Forest Service Road 95 (FR95) is paved from Stokesville to the site. Access to the site will be achieved via turnoff of FR95 to the toe of the dam. There is an access road up the right abutment that terminates at the east side of the auxiliary spillway and right groin of the dam. This would require no clearing of trees or shrubs unless the access road is widened for construction vehicles. Damage to the road that occurs as a result of construction will be repaired.

During construction, the contractor will likely stage operations at the open area at the toe of the dam and within the auxiliary spillway. If a local borrow area is developed, the contractor may use this area for staging as well. If earthfill is chosen as the preferred alternative for raising the height of the dam, additional clearing and grubbing may be required along the abutments. The installation of the secant piles and ACBs should remain within previously disturbed areas of the dam and spillway.

All of the anticipated construction zone is within the area included in the Special Use Permit that the U.S. Forest Service has issued to the Sponsors. This Special Use Permit will be renewed prior to construction.

NATIONAL ECONOMIC DEVELOPMENT (NED) ALTERNATIVE

The Sponsors have indicated that, in the absence of federal assistance, they would rehabilitate the dam to meet the required dam safety and design criteria at their own expense using the alternative proposed by NRCS. For the purposes of this evaluation, the Sponsors' Rehabilitation is used as the No Federal Action alternative. Detailed evaluation of the alternative candidate plans to rehabilitate Todd Lake indicate that they have identical scope, substantially equivalent costs, and equal effects. The rehabilitation with federal assistance is the most locally acceptable alternative and best serves the Sponsors in achieving the needs and purpose of this rehabilitation.

Therefore, the federal assistance alternative for rehabilitating the dam using a secant pile wall and ACBs to armor the auxiliary spillway is selected as the recommended plan or NED plan. Per the Federal Principles and Guidelines document and NRCS National policy, when the Future Without Federal Project is the same as the Future With Federal Project, the local costs avoided are credited as benefits. This renders the federally assisted alternative as having zero net benefits. Net benefits are zero because, by policy, the total project cost is equal to the claimed benefits and the resulting B/C ratio is 1:1. The results displayed in Table G are presented within a zero-based accounting context to highlight the costs and benefits associated with the recommended alternative alone. Within a zero-based accounting framework, the "Total Adverse Annualized" value associated with the Future Without Federal Project is displayed as the "Total Beneficial Annualized" in the Future With Federal Project column.

COMPARISON OF ALTERNATIVE PLANS

Table G summarizes the effects of each alternative considered. Refer to the Environmental Consequences section for additional information.

Table G - Summary and Comparison of Alternative Plans

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with Earth Recommended Plan – (NED Plan)	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with a Concrete Parapet Wall	Future With Federal Project Structural Rehabilitation with Federal Assistance - Roller-Compacted Concrete Chute Spillway	Future With Federal Project Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation
Sponsor Goals	Continue to provide flood protection, reduces liability.	Continue to provide flood protection, reduces liability.	Continue to provide flood protection, reduces liability.	Continue to provide flood protection, reduces liability.	Continue to provide flood protection.
Structural	Upgrade dam to meet dam safety and design criteria.	Upgrade dam to meet dam safety and design criteria.	Upgrade dam to meet dam safety and design criteria.	Upgrade dam to meet dam safety and design criteria.	Flood protection provided by mitigation.
Total Project Investment - Todd Lake	$5,415,000	$5,415,000	$5,419,000	$7,350,000	$4,760,000
National Economic Development Account					
Total Beneficial Annualized (AAEs*)	---	$236,000	$236,000	$236,000	($89,000)
Total Adverse Annualized (AAEs*)	---	$236,000	$236,000	$316,000	$209,000
Net Beneficial	---	$0	$0	($80,000)	($298,000)
Benefit/Cost Ratios	---	1.0 to 1.0	1.0 to 1.0	0.75 to 1.0	(0.58) to 1.0
Estimated OM&R**	---	$5,000	$5,000	$2,300	$500

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with Earth Recommended Plan – (NED Plan)	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with a Concrete Parapet Wall	Future With Federal Project Structural Rehabilitation with Federal Assistance - Roller-Compacted Concrete Chute Spillway	Future With Federal Project Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation
Environmental Quality Account					
WATER					
Floodplain Management	No change from existing condition.	No change from existing condition.	No change from existing condition.	No change from existing condition.	Mitigation of induced damages will be required for 29 homes and 2 businesses.
Sewer utilities	No change from existing condition. Sewer pipe will be protected during construction.	No change from existing condition. Sewer pipe will be protected during construction.	No change from existing condition. Sewer pipe will be protected during construction.	No change from existing condition. Sewer pipe will be protected during construction.	Sewer pipe will be protected, as needed.
Streams, Lakes, and Wetlands	Temporary loss of the 5.8 acre lake and 0.1 acre fringe wetland during construction.	Temporary loss of lake and 0.1 acre fringe wetland during construction. Permanent loss of 0.2 ac. of open water.	Temporary loss of the 5.8 acre lake and 0.1 acre fringe wetland during construction.	Temporary loss of the 5.8 acre lake and 0.1 acre fringe wetland during construction.	Permanent loss of open water and fringe wetlands. Establishment of 1,000' of stream channel.
Water quality	No long-term change, minimal short-term effect during construction.	No long-term change, minimal short-term effect during construction.	No long-term change, minimal short-term effect during construction.	No long-term change, minimal short-term effect during construction.	No long-term change, minimal short-term effect during construction.
Water resources	Temporary loss of the 5.8 acre lake during construction.	Temporary loss of lake during construction. Permanent loss of 0.2 ac. of open water.	Temporary loss of the 5.8 acre lake during construction.	Temporary loss of the 5.8 acre lake during construction.	Permanent loss of the 5.8 acre lake.
AIR					
Air Quality	Temporary effect during rehabilitation.	Temporary effect during rehabilitation.	Temporary effect during rehabilitation.	Temporary effect during rehabilitation.	Temporary effect during decommissioning.
PLANTS					
Forest resources	Remove <1 acre of trees.	Remove <1 acre of trees.	Remove <1 acre of trees.	Remove <1 acre of trees.	15 acres of trees planted after construction.
Invasive species	No effect.	No effect.	No effect.	No effect.	No effect.
Natural areas	No effect.	No effect.	No effect.	No effect.	No effect.

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with Earth Recommended Plan – (NED Plan)	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with a Concrete Parapet Wall	Future With Federal Project Structural Rehabilitation with Federal Assistance - Roller-Compacted Concrete Chute Spillway	Future With Federal Project Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation
ANIMALS					
Fish and wildlife	Aquatic species recovery in 1-4 years.	Aquatic species recovery in 1-4 years.	Aquatic species recovery in 1-4 years.	Aquatic species recovery in 1-4 years.	Stream aquatic species would replace lake species.
Migratory birds	Temporary effect during construction.	Temporary effect during construction.	Temporary effect during construction.	Temporary effect during construction.	Permanent loss of lake.
HUMAN					
Construction access	There will access to campground and seasonal residences during construction.	There will access to campground and seasonal residences during construction.	There will access to campground and seasonal residences during construction.	There will access to campground and seasonal residences during construction.	There will access to campground and seasonal residences during construction.
Environmental Justice and Civil Rights	No disparate treatment.	No disparate treatment.	No disparate treatment.	No disparate treatment.	29 homes and 2 businesses would be affected by mitigation. Seasonal residents affected by loss of lake.
Local and Regional Economy	Temporary positive effect on local and/or regional construction companies. Temporary loss of campground revenue during construction.	Temporary positive effect on local and/or regional construction companies. Temporary loss of campground revenue during construction.	Temporary positive effect on local and/or regional construction companies. Temporary loss of campground revenue during construction.	Temporary positive effect on local and/or regional construction companies. Temporary loss of campground revenue during construction.	Temporary positive effect on local and/or regional construction companies. Temporary loss of campground revenue during construction.
Public health and safety	Decrease potential for loss of life from dam breach.	Decrease potential for loss of life from dam breach.	Decrease potential for loss of life from dam breach.	Decrease potential for loss of life from dam breach.	Mitigation will provide flood protection. May be some nuisance road flooding.
Public recreation	Short-term loss of access during construction.	Short-term loss of access during construction.	Short-term loss of access during construction.	Short-term loss of access during construction.	Permanent loss of lake-based recreation. Trails and campground would still be used.

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with Earth Recommended Plan – (NED Plan)	Future With Federal Project Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, Raise Top of Dam with a Concrete Parapet Wall	Future With Federal Project Structural Rehabilitation with Federal Assistance - Roller-Compacted Concrete Chute Spillway	Future With Federal Project Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation
Scenic beauty	Short-term effects only.	Short-term effects only.	Parapet wall would be visible from campground.	RCC Chute spillway would be visible from campground.	View would change from water to trees.
Social issues	Temporary loss of access to lake, campground, and trails.	Temporary loss of access to lake, campground, and trails.	Temporary loss of access to lake, campground, and trails.	Temporary loss of access to lake, campground, and trails.	No change to 100-year flood protection of homes and businesses. Permanent loss of lake-based recreation.

* Per 1.7.2 (a) (4) (ii) of the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (P&G), U.S. Water Resources Council, March, 1983, allowing for abbreviated procedures, damage reduction and recreation benefits have not been displayed because they are the same for both alternatives and no net change in benefits occurs when comparing the two candidate plans to each other. The federally assisted alternative is displayed within a zero-based accounting context that credits local costs avoided (Total Adverse Annualized for the Future Without Federal Project scenario) as adverse beneficial effects (Total Beneficial Annualized) consistent with P&G 1.7.2(b)(3). Although the average annual benefits of rehabilitation are $233,000, net benefits are zero because the total project cost is equal to the claimed benefits and the resulting B/C ratio is 1:1. "AAEs" stands for Average Annual Equivalents which are based on a 4.00% discount rate and a 52 year period of analysis (1 year to design, 1 year to install and a 50 year expected useful life).

** OM&R – Operation, Maintenance and Replacement Costs include replacement of some topsoil and vegetation over the control section of the auxiliary spillway once in the anticipated useful life of the structure.

Note: Regional Economic Development account (RED) concerns were not identified during the scoping process. Therefore, the RED account information is not included

ENVIRONMENTAL CONSEQUENCES

Alternative plans of action can result in a multitude of effects on resources upstream and downstream of Todd Lake. This section describes anticipated effects on resource concerns identified by the Sponsors, the public, and agency personnel in the Scoping meeting and the public meetings. Topics are listed in the same categories as listed in Table G.

There are five plans that were considered and evaluated in detail:

1) No Federal Action (Sponsors' Rehabilitation);
2) Structural Rehabilitation with Federal Assistance – Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative);
3) Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a concrete parapet wall;
4) Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway; and
5) Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment and Mitigation of Induced Damages.

All of the rehabilitation plans considered include replacement of the principal spillway riser. The Sponsors have indicated that they will use the plan developed by NRCS to complete the rehabilitation of the dam in the event that Federal funding is not available. The *No Federal Action (Sponsors' Rehabilitation)* alternative would be the same or involve the same components as the *Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative).* This alternative maximizes net benefits with a benefit/cost ratio of 1:1, and is the rehabilitation alternative preferred by the Sponsors.

SOILS

There are no identified concerns with Prime and Unique Farmlands and farmland of statewide significance or soil resources.

WATER

There are no identified concerns with regional water resources plans (including coastal resource plans), sole source aquifers, or Wild and Scenic Rivers.

Floodplain Management

Existing Conditions: Augusta County currently participates in the Flood Insurance Program.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the auxiliary spillway of Todd Lake will be done in accordance with all necessary requirements and restrictions. The Sponsors are responsible for assuring compliance and for obtaining any necessary permits and certificates.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Prior to removal of the dam, the 29 homes and two businesses (three structures) in the existing 100-year floodplain will be treated with floodproofing, elevation, or removal. The one home and one business structure that will be added to the without-dam 100-year floodplain will also be treated. After mitigation, the risk of damage from the 100-year flood event will be the same as with the dam in place.

Sewer Utilities

Existing Condition: There is a cast iron sanitary sewer pipe that passes through the embankment of the dam on the left side. This pipe was installed at the time of dam construction so that showers and toilet facilities could be installed at the campground at a later time. The pipe drains to a septic drain field downstream of the dam.

No Federal Action (Sponsors' Rehabilitation): There are no anticipated changes to the existing sewer pipe as a result of the planned rehabilitation activities. During construction, impacts to the sewer drain field will be minimized.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: The portion of the dam embankment that will be removed is adjacent to the left abutment. The sewer pipe through the embankment will not be impacted. However, the pipe will be exposed in the pool area. Fill will be placed over the pipe to protect it, as needed. During construction, impacts to the sewer drain field will be minimized.

Streams, Lakes, and Wetlands

Existing Conditions: The main stream associated with Todd Lake is Skidmore Fork. Approximately 0.1 acres of fringe wetlands were identified along the shoreline. The 5.8 acres of the lake are considered to be open water wetlands. No wetlands were identified upstream of the inlet area and downstream of the outlet.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will have no permanent adverse effects on Skidmore Fork or its tributaries. The lake will be drained during rehabilitation. This will result in the temporary loss of 5.8 acres of surface water. The fringe wetlands around the lake will also be temporarily impacted during this time. Raising the top of

the dam with earthfill will result in a permanent loss of 0.2 acres of surface water because earthfill will be placed across the upstream face of the dam.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Removal of the dam would result in the permanent loss of 5.8 acres of open water wetlands and 0.1 acres of fringe wetlands. As part of the decommissioning process, approximately 1,000 feet of stream channel would be established in the pool area and stabilized as needed to prevent damage to upstream and downstream reaches. The entire pool area would be planted to trees in order to establish a riparian forested buffer.

Water Quality

Existing Conditions: Todd Lake and Skidmore Fork are not listed as impaired in the 2010 305(b)/303(d) Virginia Water Quality Assessment Report.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will not alter the present water quality in the watershed. With the required erosion and sediment control measures, there should be minimal temporary impacts on water quality associated with construction. No long-term impacts on water quality from rehabilitation activities are anticipated.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Removal of the dam will not alter the present water quality in the watershed. With the required erosion and sediment control measures, there should be minimal temporary impacts on water quality associated with construction. The sediment that would be trapped in the lake will move directly downstream. No long-term impacts on water quality from decommissioning activities are anticipated because the amount of sediment produced by the watershed is limited.

Water Resources

Existing Conditions: The primary purpose of the lake is to provide flood protection. However, it has become an important part of the community because of the recreation value that it provides.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will result in a permanent loss of 0.2 acres of surface area in the lake. The floodwater detention capacity will be reduced by about 1%. There will be a temporary impact to recreation on the lake while it is drained for rehabilitation.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Removal of the dam will have a permanent effect on water resources. The sediment that would be trapped in the lake will move directly downstream. There would be a loss of a potential water supply for wildfire fighting. Water-based recreational opportunities will be lost.

AIR

Air Quality

Existing Conditions: Air quality in the area is satisfactory. Augusta County is not within a non-attainment area for ozone or particulate matter-2.5 ($PM_{2.5}$) according to the 2010 Virginia Ambient Air Monitoring Data Report.

No Federal Action (Sponsors' Rehabilitation): During the rehabilitation of the dam, particulate matter (dust) from construction activities will increase. Air pollution abatement actions will minimize any potential temporary dust problems during construction, and the proposed work is not expected to violate any federal, state, or local air quality standards.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: During the removal of the dam, particulate matter (dust) from

construction activities will increase. Air pollution abatement actions will minimize any potential temporary dust problems during construction, and the proposed work is not expected to violate any federal, state, or local air quality standards.

PLANTS

There are no identified concerns with Endangered and Threatened Plant Species or Riparian Areas.

Forest Resources

Existing Conditions: Todd Lake is located within the George Washington and Jefferson National Forest. Approximately 98% of the watershed above the dam is forested. The Forest boundaries extend approximately 4.35 miles below the dam. There are no anticipated changes to this area.

No Federal Action (Sponsors' Rehabilitation): During the rehabilitation of the dam, there will less than one acre of trees removed from the outlet of the auxiliary spillway and the borrow area.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: There will be no trees removed during construction. The pool area and the abandoned portion of the dam embankment will be planted to trees. The 100-year floodplain created by the dam removal will also be forested to create a riparian corridor that is similar to what exists in other portions of the watershed.

Invasive Plant Species

Existing Conditions: At the present time, there are no known invasive species on the site.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the Todd Lake dam would not change the existing conditions for invasive species. Care will be taken during construction to avoid the introduction of invasive species and comply with Executive Order 13112.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Removal of the Todd Lake dam would not change the existing conditions for invasive species. Care will be taken during construction to avoid the introduction of invasive species and comply with Executive Order 13112.

Natural Areas

Existing Conditions: There are no State Natural Area Preserves under the jurisdiction of the Virginia Department of Conservation and Recreation's Natural Heritage Division.

No Federal Action (Sponsors' Rehabilitation): Since there are no designated natural areas, no adverse impacts to this resource are anticipated.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Since there are no designated natural areas, no adverse impacts to this resource are anticipated.

ANIMALS

There are no identified concerns with coral reefs, ecologically critical areas, endangered or threatened species, essential fish habitat, or invasive animal species.

Fish and Wildlife

Existing Conditions: There are few fish in Todd Lake since it is drained by the U.S. Forest Service about every two years. This lake is not stocked.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam would result in no permanent changes in habitat around the lake. Although the lake would be drained during rehabilitation, the aquatic species are expected to recover within one to four years.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Since the entire pool of the lake would be removed, the species that depend upon open water habitat would be adversely affected. However, species associated with streams would naturally re-introduce themselves. Upstream and downstream fisheries and habitat will be reconnected.

Migratory Birds

Existing Conditions: The lake is utilized by a few species of migratory birds.

No Federal Action (Sponsors' Rehabilitation): There will be temporary effects on some migratory bird species while the 5.8 acre lake is drained.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Removal of the lake will have an effect on some species of migratory birds. However, there are other lakes in this watershed that could be utilized instead.

HUMAN

There are no identified concerns with cultural resources, land use, parklands, or scientific resources.

Construction Access

Existing Conditions: Forest Road 95 is the primary access to the lake, the campground, and the private property upstream. This road is adjacent to the right abutment of the auxiliary spillway.

No Federal Action (Sponsors' Rehabilitation): During construction, FR 95 will be used by the contractor to access the site. To the extent possible, there will still be access to the campground and to the private property upstream. Damages to the road that occur during construction will be repaired.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Same as the No Federal Action (Sponsors' Rehabilitation).

Environmental Justice and Civil Rights

Existing Conditions: There is an estimated population of 440 below the dam and a small number of seasonal residents within the U.S. Forest Service land above the dam.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will have positive economic and social effects across all residents within the floodplain and above the dam. Since vehicle operators also are significant beneficiaries of the proposed rehabilitation, it is reasonable to conclude that protection of the roads and bridges will benefit all racial, ethnic, and socio-economic groups within the watershed and below the dam. Avoiding a dam breach will directly benefit all local residents and taxpayers in general within Augusta County and the Commonwealth of Virginia.

There are no known disparate impacts from the rehabilitation project. It was explained to local residents that rehabilitation of the dam would not enhance their downstream flood protection, but simply maintain the designed level of flood protection while reducing the risk to life and property that might occur from a dam breach.

Approximately 440 people would benefit directly from the rehabilitation of the dam. These include residents in the breach zone and the seasonal residents of the few homes above the lake. There are indirect benefits for the estimated 4,400 more people who use the area around the lake for recreation during the summer, spring and fall.

There would also be downstream benefits to the occupants of about 700 vehicles/day along Stokesville Road and Towers Road that would be affected by a breach event. This is primarily those people affected by impacts to the roads and bridges and includes others who would lose access to emergency services or would be cut off from their residences or jobs.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: There are 29 homes and two businesses that would be affected by removal of the dam due to the required mitigation in the 100-year floodplain. The seasonal residences located above the dam were in place prior to construction of the dam. However, for the past 49 years, these owners have enjoyed the benefits of access to the lake. Removal of the lake would have an adverse effect on these properties in non-monetary terms and also would have the potential to reduce the value of the properties.

Local and Regional Economy

Existing Conditions: The recreation use of the lake and adjacent campground, the two local businesses, the downstream farming, and the roads used for commuting to work sites contribute significantly to the local economy.

No Federal Action (Sponsors' Rehabilitation): There would be a temporary positive effect on the local economy during the construction period. This may be off-set by the temporary negative effects caused by the loss of the lake during the camping season. Revenue from the campground will be eliminated during the construction period.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Initially, the effects would be the same as the No Federal Action (Sponsors' Rehabilitation). Usage of the campground facility would decline as a result of the loss of the lake, and there would be an adverse effect on the local economy.

Public Health and Safety

Existing Conditions: The existing earth auxiliary spillway does not have the integrity, stability, or capacity necessary to withstand the Probable Maximum Precipitation event. It is projected that the auxiliary spillway would breach at a 6-hour precipitation event of approximately 13 inches. In addition to the amount of water flowing through the auxiliary spillway, this event has the potential to release the entire amount of water and sediment stored upstream of the dam. This is a volume of approximately 688 acre-feet. Approximately 442 people are at risk for loss of life. Eighty homes and two businesses are located in the breach zone of this dam. The Girl Scout Camp has 28 buildings that would be at risk. Two bridges and several culverts could also be impacted. There are 14 state roads and 11 private roads in the breach zone.

No Federal Action (Sponsors' Rehabilitation): Under this alternative, the dam would be structurally rehabilitated using current design and safety criteria in order to provide continued flood protection for 50 years after the rehabilitation period is complete. The downstream flooding levels would be the same as they are presently. The threat to loss of life from failure of the dam would be greatly reduced.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: With mitigation, the homes and businesses in the without-dam 100-year floodplain will have the same level of flood protection that they had with the dam in place. There may be some nuisance flooding on the roads.

Public Recreation

Existing Condition: Todd Lake provides opportunities for lake-based activities such as canoeing, jogging, walking, bird watching and environmental education.

No Federal Action (Sponsors' Rehabilitation): There are no anticipated permanent changes to the existing recreational opportunities as a result of the planned rehabilitation activities. During the construction period, access to the lake may be limited.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: Same as the No Federal Action (Sponsors' Rehabilitation).

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: The existing campground and trails would still be utilized. However, the lake-based recreational opportunities would be lost. Over time, the restored stream channel may support native fish.

Scenic Beauty

Existing Condition: At the present time, the dam embankment, the auxiliary spillway and training dikes are in grass. The area surrounding the rest of Todd Lake is forested.

No Federal Action (Sponsors' Rehabilitation): When the rehabilitation of the auxiliary spillway is complete, the entire length of the auxiliary spillway will be in grass. There will be no visible concrete. There will be temporary impacts to the scenic beauty of the area while the lake is drained and construction is underway.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: The concrete parapet wall is likely to be considered visually intrusive on the landscape. Although there are some construction techniques to reduce the visual impact, it would not be practical to completely mask the presence of the wall.

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: With an RCC chute spillway, most of the dam would still be vegetated. However, the chute

spillway would be located in the center of the dam rather than on the left abutment. It would be visible from the campground and is likely to be considered visually intrusive on the landscape.

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: Although some of the dam embankment would be removed in this alternative, the majority of it would remain in place. However, it would be planted with trees and would, over time, blend in with the surrounding area. The pool area and stream corridor would also be forested.

Social Issues

Existing Condition: Todd Lake has provided value to the community for 49 years by providing flood protection, recreation, and scenic beauty. At the public meeting, the main concern expressed by the local citizens was the need to maintain the flood protection provided by the structure.

No Federal Action (Sponsors' Rehabilitation): When rehabilitation of the dam is complete, the dam will provide flood protection for an additional 50 years. The entire length of the auxiliary spillway and embankment will be in grass. There will be no visible concrete. There will be temporary impacts to the scenic beauty of the area while the lake is drained and construction is underway. The recreational opportunities will also be limited during the construction period.

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with Earth (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Structural Rehabilitation with Federal Assistance - Secant Pile Wall, ACB Armor, and Raise Top of Dam with a Concrete Parapet Wall: When rehabilitation of the dam is complete, the dam will provide flood protection for an additional 50 years. The entire length of the auxiliary spillway will be in grass. The concrete parapet wall will extend across the length of the embankment. The recreational opportunities will be limited during the construction period.

Structural Rehabilitation with Federal Assistance – Roller-Compacted Concrete Chute Spillway: When rehabilitation of the dam is complete, the dam will provide flood protection for an additional 50 years. The RCC chute will be located in the center of the embankment. The recreational opportunities will be limited during the construction period.

Removal of Dam with Federal Assistance - Partial Removal of the Dam Embankment with Floodproofing and Relocation: With mitigation, the homes and businesses in the 100-year floodplain would have the same level of flood protection as provided by the dam. However, there may be some nuisance flooding of the roads. The recreation opportunities would be different but there would still be some water-based recreation near the campground. The view from the campground would be more limited due to the planned reforestation.

CUMULATIVE EFFECTS

NRCS has constructed three flood control dams in this watershed; Todd Lake, Hearthstone Lake, and Elkhorn Lake. Todd Lake and Hearthstone Lake are currently operating under conditional certificates due to a need for rehabilitation. The No Federal Action alternative for Todd Lake calls for the Sponsors to rehabilitate the dam. All of the proposed rehabilitation alternatives would have the same effect on the environment as the No Federal Action alternative. The Partial

Removal of the Dam Embankment alternative is perceived to have a generally negative effect on the community and the environment even though the same level of flood protection would be achieved. This alternative has the least amount of public acceptance. The cumulative effects of the other projects on the principal resources of concern, along with the social and economic effects, are to maintain the existing social, economic, and environmental conditions of the community. The cumulative effects of rehabilitating Todd Lake would be the same, i.e., to maintain the existing social, economic and environmental conditions of the community. In both the recommended plan and the rehabilitation by the local Sponsors, all of the existing dams in the watershed stay in place, essentially the same level of flood protection is provided, and the existing emergency action plan remains in force.

RISK AND UNCERTAINTY

Assessments, considerations, and calculations in this plan are based on a 52-year period of analysis. Associated monetary flooding impacts of downstream houses and businesses were based on the National Flood Insurance Program's Actuarial Rate Review. National averages were used to identify the value of potential damages. Actual damages occurring from each storm event could realistically be higher or lower, depending on soil moisture conditions at the time of a given event, associated debris flows, future development, and other factors such as changes in precipitation from various storm events. Although potential climatic changes are not expected to alter calculation of the PMP events, they could increase the occurrence of low frequency, high intensity storm events and associated flood damages.

An easement was procured to the crest of the auxiliary spillway prior to the original construction as part of the special use permit issued by the U.S. Forest Service. The Special Use Permit will be re-issued prior to rehabilitation. This meets NRCS policy.

No changes water quality are anticipated due to this project. There will be a 0.2 acre decrease in open wetlands.

The sediment rate projected for the life of the project is based on the current conditions in the watershed. There are no anticipated changes to this watershed.

The objective of this project is to meet applicable NRCS and Virginia public health and safety standards associated with this watershed dam. From a financing and administrative standpoint, the Sponsors have committed to NRCS that they are able to fund the required 35% of the total project costs to complete installation of the selected alternative and can perform the required maintenance on the upgraded structure for 50 years after construction. Statistically, there is a less than 1.0% chance in any given year that the auxiliary spillway would flow during the anticipated life of the rehabilitated structure. However, it is possible for several events to occur during this time period. If a flow event occurs, and all the soil over the ACB armor downstream of the secant pile wall is removed, the estimated repair cost would be $10,000 and would take approximately one month. This would include 2,500 SY of topsoil and seed. The estimates do not include any costs for offsite damages incurred during this catastrophic event. Routine maintenance is not included in these amounts.

CONSULTATION AND PUBLIC PARTICIPATION

The sponsoring organizations are the Headwaters Soil and Water Conservation District and the Augusta County Board of Supervisors. The Headwaters Soil and Water Conservation District has been responsible for the operation and maintenance of the Todd Lake Dam since it was built. Interest for rehabilitating the dam began in October 2004 with the first issuance of a Conditional Certificate by the Virginia Division of Dam Safety. The certificate was issued because of problems identified with the auxiliary spillway. In 2006, the Headwaters Soil and Water Conservation District contracted with a private engineering firm to conduct a detailed analysis of the auxiliary spillway. The firm identified potential problems with the capacity and integrity of the auxiliary spillway. NRCS received an application for federal assistance for the Todd Lake Dam rehabilitation in March 2007. Public Law 83-566 of November 2000, provides for federal funds to eligible applicants for dam rehabilitation.

Local, state and federal support for the rehabilitation of the Todd Lake Dam has been strong. Input and involvement of the public has been solicited throughout the planning of the project. At the initiation of the planning process, many meetings were held with representatives of the Headwaters Soil and Water Conservation District and Augusta County to ascertain their interest and concerns regarding the dam. The Sponsors have worked closely with the local landowners and residents to provide information on the planning activities and to solicit their input on the pertinent issues to be considered during planning. The Sponsors worked to provide all residents, including minorities, with information on the planning effort and intended works of improvement.

The U.S. Forest Service consulted with the U.S. Fish and Wildlife Service and with Virginia Department of Historic Resources during this process.

The first public meeting for Todd Lake was held at the Sangerville-Towers Ruritan Hall, in Mount Solon, Virginia on November 17, 2011. Local, state and federal perspectives on the rehabilitation needs of the Todd Lake Dam were provided. The attending members of public were informed of the dam rehabilitation program and potential alternative solutions to bring the dam into compliance with current dam safety and design criteria. Meeting participants provided input on their issues and concerns to be considered during the planning process. A fact sheet was developed and distributed which addressed frequently asked questions regarding rehabilitation of the dam. There were 21 people in attendance. The audience included elected officials, representatives from county and federal agencies, and watershed residents.

A scoping meeting was held on November 17, 2011, at the Augusta County Government Center in Verona, Virginia to identify issues of economic, environmental, cultural, and social concerns in the watershed. Input was provided by local, regional, state and federal agencies at the meeting or through letters and emails to NRCS.

A second public meeting was held on April 12, 2012 at the Sangerville-Towers Ruritan Hall in Mount Solon, Virginia. Information provided to meeting attendees included a summary of the current situation of the dam, planning efforts to date, the various alternatives considered during planning, and a detailed explanation of the recommended alternative for dam rehabilitation. Attendees understood the need for the rehabilitation. There were 19 people in attendance. The

audience included elected officials, representatives from county and federal agencies, and watershed residents.

A Draft Plan was distributed for interagency and public review on June 27, 2012. Copies of the document were placed in local libraries and news articles were placed in local newspapers to solicit comments from the public during the comment period. After a 30-day review period, comments received on the draft were incorporated into the Final Plan. Letters of comment received on the draft plan and NRCS responses to the comments are included in Appendix A.

PREFERRED ALTERNATIVE

RATIONALE FOR PLAN SELECTION

The recommended plan is to rehabilitate the dam to meet current NRCS and the Commonwealth of Virginia safety and performance standards. The recommended plan meets the identified purposes and needs for the project and significantly reduces the potential risk to human life. The project Sponsors, local residents, and state and local government agencies all prefer the Recommended Plan because it:

- Minimizes the threat to loss of life to approximately 440 people that live in the 80 single family homes within the breach inundation zone.
- Provides protection for more than 740 vehicles per day that utilize Stokesville Road (520), Towers Road (190) and Reeves Road (30 vehicles).
- Provides onsite benefits to approximately 4,400 recreational users and offsite benefits to an additional 1,000 people (vehicle occupants).
- Minimizes the threat of loss of emergency service for about 52 residences, two business structures, and one church building.
- Provides downstream flood protection for the people living in the area, as well as those working, recreating, or traversing within the downstream floodplains, for an additional 50 years.
- Eliminates the liability associated with continuing to operate an unsafe dam.
- Maintains existing stream habitat downstream of the dam.
- Retains the existing aquatic and terrestrial habitat around the lake.
- Leverages federal resources to install the planned works of improvement.

The selected alternative meets the Sponsors' objectives of bringing this dam into compliance with current dam design and safety criteria, maintaining the current 100-year floodplain, and addressing resource concerns identified by the public. The selected plan is the NED Alternative. The plan reasonably meets the following four criteria: completeness, effectiveness, efficiency, and acceptability. NRCS and the Sponsors are in agreement on the recommended plan.

SUMMARY AND PURPOSE

The recommended plan of action for the dam is outlined below:

- Widen the auxiliary spillway to 220 feet. Move the control section upstream and lengthen it to 50'. Raise crest of auxiliary spillway by 0.2 feet to as-built elevation.
- Install a secant pile wall at the downstream end of the control section.
- Armor the control section and constructed outlet section with ACBs and cover the ACBs with topsoil and vegetation.

- Two earthen training dikes will extend from the top of the dam to the valley floor to protect the dam embankment and to contain the auxiliary spillway flows.
- An inlet training dike will be installed to direct flow into the auxiliary spillway.
- The dam embankment will be raised by 5.5 feet with earthfill.
- Replace the principal spillway riser.

After the implementation of these planned works of improvement, Todd Lake will meet all current NRCS and State of Virginia dam safety and performance standards.

Financial assistance from NRCS for rehabilitation of this dam is contingent on receipt of funding from Congress.

Detailed structural data for the proposed rehabilitated dam can be found in Table 3.

EASEMENTS AND LANDRIGHTS

The Sponsors are responsible for obtaining the Special Use Permit associated with the rehabilitation project. No easements in the floodpool are required since there will be no change in elevation of the auxiliary spillway.

MITIGATION

No compensatory mitigation has been identified. During construction, site mitigation measures will include erosion and sediment control, seeding of denuded areas, dust control, and other practices identified during the design process.

PERMITS AND COMPLIANCE

Installation of the recommended plan will bring the dam into compliance with current NRCS and Virginia dam safety and design criteria. Prior to construction, the Sponsors will be responsible for obtaining an alteration permit from the Virginia Soil and Water Conservation Board, and, as needed, a 404 permit from the Army Corps of Engineers, subaqueous lands permits from the Virginia Marine Resources Commission, and any other required permits. During construction, the successful contractor is required to develop a Stormwater Pollution Prevention Plan which includes applicable erosion and sediment control measures.

If cultural resources are discovered during installation, work will cease and applicable U.S. Forest Service procedures will be implemented.

The Sponsors will be responsible for obtaining the certification of compliance from the Virginia Division of Dam Safety upon completion of the project.

COSTS

As indicated in Table 1, the total project cost of the recommended plan is $5,415,000. Of this amount, PL-83-566 funds will bear $3,706,000 and nonfederal funds will bear $1,709,000. Given that certain costs are excluded from calculation of the Sponsors' contribution, the actual cash cost to the local Sponsors required for construction costs is an estimated $1,700,000. Table 2 shows details of the costs and cost-share amounts by category. Total annualized costs are shown in Table 4 along with the estimated costs for operation and maintenance. Table 5 displays the average annual flood damage reduction benefits by flood damage categories, and Table 6 displays a comparison of annual costs and benefits. A 2012 price base was used and amortized at 4.00 percent interest for the 52 year period of analysis (including a design and installation period of two years and an expected useful life of 50 years).

The cost projections for the proposed rehabilitation measures are estimated costs only for the purpose of planning. The fact that these costs are included in this plan does not infer that they are final costs. 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.

INSTALLATION AND FINANCING

The project is planned for installation in one construction season. During construction, equipment will not be allowed to operate when conditions are such that soil erosion and water, air, and noise pollution cannot be satisfactorily controlled.

The NRCS will provide assistance to the Sponsors with the Todd Lake Dam rehabilitation project. NRCS will be responsible for the following:

- Execute a project agreement with the Sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
- Execute a Memorandum of Understanding with the Sponsors to provide a framework within which cost-share funds are accredited.
- Execute an updated Operation and Maintenance Agreement with the Sponsors for the dam. This agreement will be based on the NRCS National Operation and Maintenance Manual.
- Provide financial assistance equal to 65% of total eligible project costs, not to exceed 100% of actual construction costs.
- Verify that a current Emergency Action Plan is developed before construction is initiated.
- Provide consultative engineering support, technical assistance, and approval during the design and construction of the project.
- Certify completion of all installed measures.

The Sponsors will be responsible for the following:

- Secure all needed environmental permits, easements, and rights for installation, operation and maintenance of the rehabilitated structure. This includes the Special Use Permit issued by the U.S. Forest Service.
- Prepare an updated Emergency Action Plan for the dam prior to the initiation of construction.
- Execute an updated Operation and Maintenance Agreement with NRCS for the dam. This agreement will be based on the NRCS National Operation and Maintenance Manual.
- Execute a Memorandum of Understanding with NRCS to provide a framework within which cost-share funds are accredited.
- Execute a project agreement with NRCS before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
- Provide nonfederal funds for cost-sharing of the project at a rate equal to, or greater than, 35% of the total eligible project costs.
- Acquire a regular Operation and Maintenance certificate from the Virginia Division of Dam Safety upon completion of the planned measures.
- Participate in and comply with applicable Federal floodplain management and flood insurance programs.
- Enforce all associated project easements and rights-of-way.

OPERATION, MAINTENANCE, AND REPLACEMENT

Measures installed as part of this plan, and previously installed measures, will be operated and maintained by the HSWCD with technical assistance from federal, state, and local agencies in accordance with their delegated authority. A new Operation and Maintenance agreement will be developed for Todd Lake and will be executed prior to signing a project agreement for the construction of the project. The term of the new O&M agreement will be for the projected life of the rehabilitated structure, plus two years of project design and installation, for a total of 52 years. The agreement will specify responsibilities of the Sponsors and include detailed provisions for retention, use, and disposal of property acquired or improved with PL-83-566 cost sharing. Provisions will be made for free access of district, state, and federal representatives to inspect all structural measures and their appurtenances at any time.

Table 1 - Estimated Installation Cost
Upper North River Dam No. 10, Virginia
(Dollars)[2]

Installation Cost Items	Estimated Costs		
Structural measures to rehabilitate floodwater retarding dam: Upper North River Dam No. 10:	PL-83-566 Funds[3]	Other Funds	Total
	$3,706,000	$1,709,000	$5,415,000
Total Project:	$3,706,000	$1,709,000	$5,415,000

Price base: January, 2012 Prepared: March 2012

Table 2 - Estimated Cost Distribution – Structural Measures
Upper North River Dam No. 10, Virginia
(Dollars)

	Installation Cost: PL-83-566 Funds[4]				Installation Cost: Other Funds[5]						
Installation Cost Items	Construction Costs	Engi-neering Technical Assistance Costs	Project Admin-istration Costs	Total PL-83-566 Cost	Construction Costs	Engineering Costs	Real Property Land Rights	Permits	Project Admin-istration Costs	Total Other Funds	Total Project Cost[6]
Upper North River Dam No. 10	$3,181,000	$475,000	$50,000	$3,706,000	$1,700,000	$2,000	$0	$1,000	$6,000	$1,709,000	$5,415,000
Totals:	$3,181,000	$475,000	$50,000	$3,706,000	$1,700,000	$2,000	$0	$1,000	$6,000	$1,709,000	$5,415,000

Price base: January, 2012. Prepared: March 2012

[2] All tables have a price base of 2012.
[3] Paid by the USDA/NRCS – the Federal agency responsible for assisting in installation of improvements.
[4] 65% of total eligible project cost (The actual federal cost/share excludes technical assistance and permit costs and cannot exceed 100% of the estimated construction cost).
[5] 35% of total project cost. Per NRCS policy, $5,000 in local sponsor planning costs were excluded from Tables 1 and 2. These sponsor costs are included in the calculation of cost/share as shown in the watershed agreement.
[6] Note: As per the NRCS National Watershed Manual,508.44, the actual federal cost/share amount will be calculated based on a total eligible project cost that excludes federal technical assistance costs, water, mineral and other resource rights, and all federal, state and local permits. However, for the purposes of planning, all of these costs are included in the benefit/cost analysis and are displayed as part of the public record of this analysis.

Table 3 – Structural Data for Rehabilitated Dam

Upper North River Dam No. 10, Virginia

ITEM	UNIT	AMOUNT
Hazard Class of Structure	-	High
Seismic Zone	-	2
Total Drainage Area	Sq. Mi.	3.86
Time of Concentration	Hours	1.22
Antecedent Moisture Condition II Runoff Curve Number	-	71
Elevation, Top of Dam	Feet, MSL	1944.4
Elevation, Auxiliary Spillway Crest	Feet, MSL	1933.6
Elevation, Principal Spillway Orifice Crest	Feet, MSL	1895.0
Auxiliary Spillway Type	-	Structural[1]
Auxiliary Spillway Bottom Width	Feet	220
Auxiliary Spillway Exit Slope	%	3% to 13.2%
Maximum Height of Dam	Feet	69.5 toe @ 1875
Volume of Fill (Rehabilitation)	Cu. Yd.	~2,500
Total Capacity	Ac.-Ft.	742
Sediment Submerged[2]	Ac.-Ft	40
Sediment Aerated[2]	Ac.-Ft	14
Floodwater Retarding Pool	Ac.-Ft.	680
Surface Area		
Sediment Pool	Acres	5.6
Floodwater Retarding Pool	Acres	33.1
Principal Spillway Design		
Rainfall Volume (1 day)	Inches	6.95
Rainfall Volume (10 day)	Inches	10.3
Runoff Volume (10 day)	Inches	6.5
Capacity at Crest of Auxiliary Spillway	CFS	135.2
Conduit Size	Inches	30
Conduit Type	-	Concrete
Frequency of Operation, Auxiliary Spillway	Annual % chance	1
Auxiliary Spillway Hydrograph		
Rainfall Volume	Inches	10.5
Runoff Volume	Inches	5.7
Storm Duration	Hours	6
Velocity of flow (V_e)	Ft/s	14.66
Maximum Surface Elevation	Feet, MSL	1937.23
Freeboard Hydrograph (6-hr PMP) [3]		
Rainfall Volume	Inches	28
Runoff Volume	Inches	22
Storm Duration	Hours	6
Maximum Surface Elevation	Feet, MSL	1944.38
Capacity Equivalents		
Submerged Sediment	Watershed Inches	0.19
Aerated Sediment	Watershed Inches	0.07
Floodwater capacity	Watershed Inches	3.34

[1] ACB Block System with secant pile cutoff wall Prepared: March 2012

[2] Based on the 2010 sediment survey

[3] Both the 6-hour and 24-hour duration storms were evaluated. The 6-hour storm duration was the critical duration for the freeboard hydrograph.

* Datum: NAVD88.

Table 4 - Average Annual National Economic Development (NED) Costs
Upper North River Dam No. 10, Virginia
(Dollars)

	Average Annual Equivalent Cost	Annual Operation and Maintenance Costs	Total Average Annual Equivalent Cost
Rehabilitation of Upper North River Dam No. 10	$231,000	$5,000	$236,000
Totals:	$231,000	$5,000	$236,000

Price base: January, 2012 Prepared: March 2012

Note: The average annual equivalents are based on a 4.00% discount rate and a 52 year period of analysis (2 years for project design/installation and 50 years of expected useful life).

Table 5 - Estimated Average Annual Flood Damage Reduction Benefits
Upper North River Dam No. 10, Virginia
(Dollars)

Flood Damage Category	Estimated Average Annual Equivalent Damages		Damage Reduction Benefits
	Without Federal Project	With Federal Project	Average Annual Equivalents
Structure Damages:	$11,600	$11,600	$0
Content Damages:	$5,500	$5,500	$0
Private Clean-up Costs:	$60	$60	$0
Public Clean-up Costs:	$30	$30	$0
Private Business Income Losses:	$40	$40	$0
Vehicle and Traffic and Costs:	$430	$430	$0
Infrastructure Damages:	$7,700	$7,700	$0
Public Admin. Costs:	$0	$0	$0
Totals (rounded):	$25,435	$25,450	$0

Price base: January 2012 Prepared: March 2012

Note: Damage reduction benefits resulting from the recommended plan equal zero as compared to the no federal action alternative because they are the same in scope, cost and effects, and therefore, yield equivalent benefits. Average annual benefits associated with the NED plan are estimated to be $236,000.

Table 6 - Comparison of National Economic Development (NED) Benefits and Costs
Upper North River Dam No. 10, Virginia
(Dollars)

Evaluation Unit	Benefits			Costs	Net Change	Benefit/ Cost Ratios
	Average Annual Equivalent Benefits		Total Average Annual Equivalent Benefits	Average Annual Equivalent Costs	Net Average Annual Equivalent Benefits	
	Damage Reduction Benefits	Other Benefits[1]				
Upper North River Dam No. 10	$0	$236,000	$236,000	$236,000	$0	1.0 to 1.0
Totals:	$0	$236,000	$236,000	$236,000	$0	1.0 to 1.0

Price base: January, 2012 Prepared: March 2012

Note: The average annual equivalents are based on a 4.00% discount rate and a 52 year period of analysis (2 year for project design/installation and 50 years of expected minimum useful life).

[1] The costs and benefits of the Future With Project Plan are the same as those for the Future Without Project Plan. To maintain consistency with the display in Table 4, the costs associated with the No Action Alternative are tracked as a benefit of the Preferred Alternative.

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REPORT PREPARERS

The Upper North River Watershed Supplemental Plan and Environmental Assessment was prepared primarily by the NRCS Planning Team located in Richmond, Virginia and Verona, Virginia. The document was reviewed and concurred in by state staff specialists having responsibility for engineering, resource conservation, soils, agronomy, biology, economics, geology, and contract administration. The in-house review was followed by a review by the NRCS National Water Management Center and then an interagency and public review.

The following table identifies and lists the experience and qualifications of those individuals who were directly responsible for providing significant input to the preparation of the Supplemental Plan/EA. Appreciation is extended to many other individuals, agencies and organizations for their input, assistance and consultation, without which this document would not have been possible.

NRCS NATURAL RESOURCES PLANNING TEAM

Name	**Present Title and Years in Current Position**	**Education**	**Previous Experience**	**Other**
Rebecca M. Evans	Civil Engineering Technician - 5	B.S. Natural Resources Recreation	Conservation Specialist – 2 yrs.	
David L. Faulkner	Natural Resource Economist – 23	M.S. Ag. Economics B.S. Ag. Education	Ag. Economist (SCS) - 2.5 yrs. Ag. Economist (U.S.A.I.D.) - 4.5 yrs.	
Fred M. Garst	GIS Specialist – 19	B.S. Geology	GIS/Soil Scientist - 7 yrs. Soil Cons. Tech. - 7 yrs. Geologist (Private) – 4 yrs.	
Jeffray Jones	Watersheds Program Coordinator – 2	B.S. Natural Resources Management	Ecologist - 16 yrs.	
Alica J. Ketchem	Environmental Engineer - 18	B.S. Civil Engineering M.S. Agricultural Eng.	Civil Engineer – 10 yrs.	P.E.
Mathew J. Lyons	State Conservation Engineer- 11	B.S. Civil Engineering	Civil Engineer – 12 yrs.	P.E.

Name	Present Title and Years in Current Position	Education	Previous Experience	Other
Jeffrey D. McClure	Geologist – 7	B.A. Geology B.A. Biology B.S. Geology	NRCS Geologist – total 9 yrs. Geologist (WV Dept. of Env. Prot.) - 11 yrs. Geologist (Private) – 8.5 yrs.	CPG in KY, VA, DE and PA
Kelly Ramsey	Hydraulic Engineer - 7	B.S. Biological Systems Engineering	Civil Engineer – 12 yrs.	P.E.
Samuel S. West	Project Engineer – 8	B.S. Civil Engineering Technology	Civil Engineer – 19 yrs.	
Gerald W. Wright	Project Engineer – 6	B.S. Civil Engineering	Civil Engineer – 20 yrs.	P.E., PLS

Special acknowledgment goes to John Kaylor, Headwaters Soil and Water Conservation District, who spent many hours in the Upper North River Watershed surveying, collecting data, meeting with landowners, and attending public meetings, or providing technical support.

DISTRIBUTION LIST

Comments were requested on the Draft Supplemental Plan – EA from the following agencies and organizations.

Federal Agencies	Response Received on Draft Supplemental Plan/EA
Environmental Protection Agency Region III, Philadelphia	No
U.S. Army Corps of Engineers Norfolk District	No
U.S. Department of the Interior	
Fish and Wildlife Service Gloucester, Virginia Office	No
Federal Emergency Management Agency Philadelphia	No
U.S. Department of Agriculture	
Forest Service	Yes
Farm Service Agency	No
Rural Development	No

Virginia State Agencies	
Virginia Department of Environmental Quality	
Office of Environmental Impact Review (State Clearinghouse)	Yes
Division of Land Protection and Revitalization	Yes
Division of Air	Yes
Virginia Department of Emergency Management	Yes
Virginia Department of Conservation and Recreation	
Division of Soil and Water Conservation	No
Division of Dam Safety and Floodplain Management	Yes
Division of Natural Heritage	Yes
Division of Planning and Recreation Resources	No
Division of Stormwater Management, Local Implementation	Yes

	Response Received on Draft Supplemental Plan/EA
Virginia State Agencies	
Virginia Soil and Water Conservation Board (Governor's Designated Agency)	No
Virginia Department of Agriculture and Consumer Services	No
Virginia Department of Game and Inland Fisheries	Yes
Virginia Marine Resources Commission	Yes
Virginia Department of Historic Resources	Yes
Virginia Department of Transportation	No
Virginia Department of Mines, Minerals and Energy	No
Virginia Department of Health	Yes
Other	
Virginia Association of Soil and Water Conservation Districts	No
Headwaters Soil and Water Conservation District	Yes
Augusta County	
Department of Community Development	No
Board of Supervisors	Yes
Central Shenandoah Planning District Commission	Yes

INDEX OF KEY WORDS AND PHRASES

APPENDIX A

COMMENTS AND RESPONSES

COMMONWEALTH of VIRGINIA

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www.dhr.virginia.gov

July 2, 2012

Mr. John A. Bricker, State Conservationist
USDA – NRCS
1606 Santa Rosa Rd., Suite 209
Richmond, Virginia 23229-5014

Re: *Draft Supplemental Watershed Plan No. 6 & Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, Augusta County, Virginia*
DHR File No. 2011-0306; DEQ #12-124F

Dear Mr. Bricker:

We have received the above-referenced document for review. The Todd Lake Dam rehabilitation area was previously subjected to an archaeological survey by the U.S. Forest Service. No cultural resources were identified in the study area.

We find that the draft Environmental Assessment accurately details the consultation to date. Furthermore, we find that the March 15, 2011 determination of *no historic properties affected* remains valid. Inclusion of this determination in the final EA, along with our letter of concurrence, will provide the interested public the opportunity to inspect the documentation prior to approval of the undertaking in accordance with 36 CFR 800.4(d)(1) of the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended).

If you have any questions concerning these comments or our review of this project, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

c. Mr. Michael J. Madden, USFS
Ms. Julia H. Wellman, DEQ-OEIR

Administrative Services
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 862-6416
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
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Tidewater Region Office
14415 Old Courthouse Way
2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5428
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
P.O. Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1737

July 18, 2012

Mr. Roger W. Kirchen, Archaeologist
Office of Review and Compliance
Commonwealth of Virginia
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Mr. Kirchen:

Thank you for your timely response to the referenced Draft EA submitted to your office for review. We appreciate the time and consideration given by your agency to carefully examine our assessment and your concurrence with our finding of *no historic properties affected.*

If questions or concerns arise as the project proceeds, Jeffray Jones, the Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

JOHN A. BRICKER
State Conservationist

COMMONWEALTH of VIRGINIA

Marine Resources Commission
2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Douglas W. Domenech
Secretary of Natural Resources

Jack G. Travelstead
Commissioner

July 5, 2012

Mr. John A. Bricker
State Conservationist
Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Dear Mr. Bricker,

This is a flood control project that is authorized under 28.2-1203 of the Code of Virginia and, therefore, does not require a permit from our agency. Additionally, it is in a section of the waterway with a drainage area less than 5 square miles. Thank you for the opportunity to comment.

Sincerely,

Justine R Woodward

Justine R. Woodward
Environmental Engineer

JRW/jaj
HM

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1737

July 18, 2012

Ms. Justine R. Woodward
Environmental Engineer
VA Marine Resources Commission
2600 Washington Ave. 3rd Floor
Newport News, VA 23607

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Ms. Woodward:

Thank you for your timely response to the referenced Draft EA submitted to your office for review. We appreciate the time and consideration given by your agency to carefully examine our assessment and the resulting determination that NRCS does not require a permit from your agency in the rehabilitation of this dam.

If questions or concerns arise as the project proceeds, Jeffray Jones, the Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

JOHN A. BRICKER
State Conservationist

HEADWATERS SWCD SOIL & WATER CONSERVATION DISTRICT

We work with the people who work the land.

Headwaters Soil and Water Conservation District
70 Dick Huff Lane
Verona, VA 24482
(540) 248-0148
www.headwatersswcd.org

July 6, 2012

John A. Bricker
State Conservationist
Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

RE: Comments for the Draft Supplemental Watershed Plan No. 6 & Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed Augusta County, Virginia

Dear Mr. Bricker:

We want to thank you for the opportunity to comment on the Draft Supplemental Watershed Plan for Upper North River #10, Todd Lake. The Headwaters Soil and Water Conservation District, one of the two sponsors for the rehabilitation of Todd Lake, has concerns with the estimated $5.4 million cost of the project.

The Headwaters Soil and Water Conservation District is asking the Virginia Natural Resources Conservation Service to explore additional options to stabilize the emergency spillway at Todd Lake. Before we move to design and are still in the planning phase we believe that other alternatives to the secant pile wall need to be evaluated.

Headwaters District has been the beneficiary of a great partnership with NRCS for the rehab of three dams. However, in the present economic climate it is unlikely that the combined federal, state, and local funding can be secured for an estimated $5.4 million project. Any proposed authorized funding in the upcoming Farm Bill is no guarantee of actual appropriated federal assistance. In fact, our latest correspondence indicates that the FY-2013 Senate Ag Appropriations Bill has "zeroed out" the Watershed Rehabilitation Program. The National Economic Development Alternative in the absence of federal assistance, as outlined in the draft supplement, states that the sponsors' decision is to rehabilitate the dam using the preferred NRCS alternative. The sponsors' decision was made because Virginia NRCS provided cost-efficient solutions for past rehabs. Before moving forward with this alternative we need to be assured that it is providing for the safety of the citizens but at the most responsible cost to the taxpayer.

We are asking that more cost-effective conventional construction techniques be thoroughly investigated.

Sincerely,

Charles E. Horn/cp

Charles E. Horn
Chairman, Headwaters SWCD

cc: Jeffray Jones
Mathew Lyons
Wade Biddix

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1734

August 2, 2012

Mr. Charles E. Horn, Chairman
Headwaters SWCD
70 Dick Huff Lane
Verona, VA 24482

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Mr. Horn:

Thank you for your timely response to the referenced Draft EA submitted to your office for review. We appreciate the excellent partnership we have with the Headwaters SWCD and Augusta County on this project. We also appreciate the time and consideration expended to carefully examine the Plan and recognize your concerns with the estimated cost of the preferred alternative.

NRCS staff met with Augusta County staff and Headwaters District members and staff on July 31, 2012, to discuss the Sponsors' concerns. In short, it was agreed upon by all present that the Final Plan will be completed without significant change from the proposed Draft Plan. Furthermore, it was agreed that during the design phase of the project NRCS, in conjunction with an Architectural/Engineering contractor, the U. S. Forest Service and the project Sponsors, will further evaluate the most cost-effective and technically sound design for this project. We will strive to provide protection for the lives and property of downstream citizens.

If questions or concerns arise as the project proceeds, Jeffray Jones, Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

JOHN A. BRICKER
State Conservationist

cc: John Kaylor, Conservation Specialist, Headwaters SWCD, Verona
Charles Ivins, NRCS, District Conservationist, Verona
Louis Heidel, NRCS, ASTC (Field Operations), Harrisonburg

PATRICK J. COFFIELD – COUNTY ADMINISTRATOR
AUGUSTA COUNTY GOVERNMENT CENTER
P.O. BOX 590, VERONA, VA 24482-0590
(540) 245-5610 FAX (540) 245-5621
coadmin@co.augusta.va.us

12-109
July 6, 2012

John A. Bricker
State Conservationist
Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Re: Review Comments of "Draft Supplemental Watershed Plan No. 6 & Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, Augusta County, Virginia"

Dear Mr. Bricker,

Thank you for the opportunity to comment on the draft plan and environmental assessment for this project. We are excited to have another of the 16 flood control dams in the greater Augusta County area in the rehabilitation program and are confident that this will be yet another successful project. We do however have some concerns with the current plan.

Our most significant concern is with the estimated cost of the preferred alternative and we believe that additional alternatives need to be considered. The sponsors have participated in several meetings to develop the plan leading to what is now listed as the preferred alternative, however there has yet to be an open and detailed discussion of design options within the "Rehabilitate the Dam" option.

In the end, the preferred alternative presented in the draft plan may very well be the best alternative. However, we believe that continued consideration of alternatives is in the public interest and encourage further discussion of those alternatives. We cite the current Mills Creek Dam project as an example where continued diligence and refinement of the alternatives turned what was once estimated to be a three million dollar project into one that was just recently awarded for $1.26M.

As was done as Mills Creek Dam and our other previous rehabilitations, we expect that NRCS will further value engineer this project as we proceed to design, however we think that more of this work should be done up front before we commit, even in principle, to a project of this cost.

We appreciate your consideration of our comments and look forward to working with your agency to rehabilitate this structure.

Sincerely,

Patrick J. Coffield, County Administrator

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1734

August 2, 2012

Mr. Patrick J. Coffield, County Administrator
Augusta County Government Center
P. O. Box 590
Verona, VA 24482

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Mr. Coffield:

Thank you for your timely response to the referenced Draft EA submitted to your office for review. We appreciate the excellent partnership we have with Augusta County and the Headwaters SWCD on this project. We also appreciate the time and consideration expended to carefully examine the Plan and recognize your concerns with the estimated cost of the preferred alternative.

NRCS staff met with Augusta County staff and Headwaters District members and staff on July 31, 2012, to discuss the Sponsors' concerns. In short, it was agreed upon by all present that the Final Plan will be completed without significant change from the proposed Draft Plan. Furthermore, it was agreed that during the design phase of the project that NRCS, in conjunction with an Architectural/Engineering contractor, the U. S. Forest Service and the project Sponsors, will further evaluate the most cost-effective and technically sound design for this project. We will strive to provide protection for the lives and property of downstream citizens.

If questions or concerns arise as the project proceeds, Jeffray Jones, Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

JOHN A. BRICKER
State Conservationist

cc: Doug Wolfe, County Engineer, Augusta County
Charles Ivins, NRCS, District Conservationist, NRCS, Verona
Louis Heidel, NRCS, ASTC (Field Operations), Harrisonburg

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

July 19, 2012

John Bricker
NRCS
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229

Re: Upper North River Watershed – Todd Lake Dam Rehabilitation

Dear Mr. Bricker:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

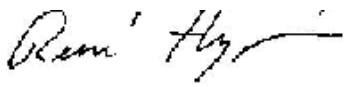
Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,



S. Rene' Hypes
Project Review Coordinator

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1737

July 23, 2012

Ms. S. Rene' Hypes
Commonwealth of Virginia
Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, VA 23219

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Ms. Hypes:

Thank you for your timely response to the referenced Draft EA submitted to your office for review. We appreciate the time and consideration given by your agency to carefully examine our assessment and provide input.

We hereby acknowledge receipt of your letter indicating that your department has no conflict with the rehabilitation proceeding as presented.

If questions or concerns arise as the project proceeds, Jeffray Jones, the Watersheds Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

JOHN A. BRICKER
State Conservationist

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

July 24, 2012

Mr. John A. Bricker
State Conservationist
USDA Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

RE: Draft Environmental Assessment: Supplemental Watershed Plan No. 6 for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, Augusta County, U.S. Department of Agriculture Natural Resources Conservation Service (DEQ # 12-124F)

Dear Mr. Bricker:

The Commonwealth of Virginia has completed its review of the above-referenced draft environmental assessment (EA). The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. The following agencies joined in this review:

Department of Environmental Quality
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Health
Department of Historic Resources
Marine Resources Commission
Central Shenandoah Planning District Commission

Augusta County also was invited to comment.

PROPOSED FEDERAL ACTION

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) submitted an EA for improvements to the Upper North River Dam No. 10 at Todd Lake in Augusta County. The EA is for the supplemental watershed plan that recommends rehabilitating the dam to meet current safety and design criteria, which will be met by implementation of the preferred alternative. Under the preferred alternative, the USDA NRCS plans to expand the auxiliary spillway by 20 feet and lengthen the control section. A secant pile wall will be used to armor the auxiliary spillway from the upstream end of the control section to the end of the constructed outlet. Upstream and downstream training dikes will be installed, and the embankment will be raised by 5.5 feet.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Water Quality and Wetlands. Under the preferred alternative, the lake will be drained during rehabilitation and result in the temporary loss of 5.8 acres of surface water (page 42). The fringe wetlands around the lake also will be temporarily impacted during this time. In addition, the EA (page 43) states that there should be minimal temporary impacts and no long-term impacts on water quality from rehabilitation activities.

1(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations, covering a variety of permits to include Virginia Pollutant Discharge Elimination System Permit (VPDES), Virginia Pollution Abatement Permit, Surface and Groundwater Withdrawal Permit, and the Virginia Wetlands Protection (VWP) Permit. The VWP Permit is a state permit which governs wetlands, surface water and surface water withdrawals and impoundments. It also serves as § 401 certification of the federal Clean Water Act § 404 permits for dredge and fill activities in waters of the United States. The VWP Permit Program is under the Office of Wetlands and Stream Protection and Compliance within the DEQ Division of Water Quality Programs. In addition to central office staff who review and issue VWP Permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities.

1(b) Agency Comments. The DEQ Valley Regional Office (VRO) states that the disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers (Corps). The Corps is the final authority for an official confirmation of whether there are jurisdictional wetlands or other surface waters that may be impacted by the proposed project. Review of National Wetland Inventory maps for locating wetlands may not be sufficient, and there may need to be a site-specific review of the site by a qualified professional.

1(c) Agency Recommendations. If construction activities will occur in or along any streams (intermittent or perennial), ponds or wetlands, contact DEQ VRO to determine

the need for any permits prior to commencing work that could impact surface waters or wetlands.

In general, DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:

- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.
- Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Erosion and sedimentation controls should be designed in accordance with the most current edition of the *Virginia Erosion and Sediment Control Handbook*. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote revegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Measures should be employed to prevent spills of fuels or lubricants into state waters.

1(d) Requirements.

- Any proposed surface water impacts should comply with the requirements of the VWP Program.

- Even if no water quality impacts are anticipated from the intentional placement of fill material in jurisdictional waters, potential impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs).

2. Subaqueous Lands.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission (VMRC) regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code § 28.2-1200 through 1400.

The VMRC serves as the clearinghouse for the Join Permit Application (JPA) used by the:

- Corps for issuing permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act;
- DEQ for issuance of a VWP permit;
- VMRC for encroachments on or over state-owned subaqueous beds as well as tidal wetlands; and
- local wetlands board for impacts to wetlands.

The VMRC distributes the completed JPA to the appropriate agencies. Each agency conducts its review and responds.

2(b) Agency Finding. VMRC states that this is a flood control project that is authorized under 28.2-1203 of the Code of Virginia and, therefore, does not require a permit from VMRC. Additionally, it is in a section of the waterway with a drainage area less than 5 square miles.

3. Erosion and Sediment Control, and Stormwater Management.

3(a) Agency Jurisdiction. The Department of Conservation and Recreation (DCR) Division of Stormwater Management (DSM) administers the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R) and the Virginia Stormwater Management Law and Regulations (VSWML&R).

3(b) Erosion and Sediment Control, and Stormwater Management. According to DCR DSM, the USDA NRCS and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with the VESCL&R and VSWML&R, including coverage under the General Permit for Discharges of Stormwater from Construction Activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act Section 313, etc.). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles and related land-disturbance activities that result in the land disturbance of 10,000 square feet would be regulated by VESCL&R.

Accordingly, USDA NRCS must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan is submitted to the DCR regional office that serves the area where the project is located for review for compliance. USDA NRCS is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites and other mechanisms consistent with agency policy.

3(c) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities. According to DCR DSM, the operator or owner of construction activities involving land-disturbing activities equal to or greater than 1 acre are required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific SWPPP. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit, and it must address water quality and quantity in accordance with the Virginia Stormwater Management Program (VSMP) Permit Regulations. General information and registration forms for the General Permit for Discharges of Stormwater from Construction Activities are available on DCR's website at *www.dcr.virginia.gov/soil_and_water/index.shtml.*

4. Air Quality Impacts. The EA (page 44) states that air pollution abatement actions will minimize any potential temporary dust problems during construction.

4(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that become Virginia's Air Pollution Control Law. DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

4(b) Ozone Attainment Area. The DEQ Air Division states that the proposed project is in an ozone attainment area.

4(c) Requirements.

> ***4(c)(i) Open Burning.*** If the project includes the burning of vegetative debris, this activity must meet the requirements under 9VAC5-130 *et seq.* of the regulations for open burning, and it may require a permit. The regulations provide for, but do not require, the local adoption of a model ordinance concerning open

burning. Contact officials with the appropriate locality to determine what local requirements, if any, exist.

DEQ VRO states that open burning must be coordinated with the local fire official to ensure that all local ordinances are met.

4(c)(ii) Fugitive Dust. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9VAC5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

DEQ VRO states that water should not be used for dust control to the extent that it results in runoff to surface waters or wetlands.

4(d) Agency Recommendations.

- Contact DEQ VRO prior to operation of fuel-burning or other air-pollution-emitting equipment (including generators, wood chippers or grinders).
- Shred and chip vegetative debris for reuse on-site instead of open burning.

5. Solid and Hazardous Wastes, and Hazardous Materials.

5(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by DEQ, the Virginia Waste Management Board and EPA. They administer programs created by the federal Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response Compensation and Liability Act, commonly called Superfund, and the Virginia Waste Management Act. DEQ administers regulations established by the Virginia Waste Management Board and reviews permit applications for completeness and conformance with facility standards and financial assurance requirements. All Virginia localities are required, under the Solid Waste Management Planning Regulations, to identify the strategies they will follow on the management of their solid wastes to include items such as facility siting, long-term (20-year) use, and alternative programs such as materials recycling and composting.

5(b) Agency Comments. The Division of Land Protection and Revitalization (DLPR) (formerly the Waste Division) states that the EA does not address potential solid and/or hazardous waste issues or include a search of waste-related databases. The DLPR staff has conducted a cursory review of its database files under the zip code 24482,

including a Geographic Information System database search of the project site, and determined that facility waste sites are located within the same zip code of the proposed project. Although none of the identified sites appeared to be in close proximity to the project site, the potential impact to the project should be further evaluated.

Hazardous Waste Facilities

The search of the RCRAInfo database under zip code 24482 found 16 facilities although none appeared to be in the area of the project.

Petroleum Release Sites

The following petroleum release sites were found on the DEQ's Inventory in the project area:

- Stokesville Market, 90 North River Road, Solon, VA 22843. ID #s 19901105 and 20086020. Event Dates: 8/31/2007 and 3/14/2006. Status: Closed.
- White Way Lunch, 2175 Hankey Mountain Highway, Churchville, VA 24421. ID # 19930071. Event Date: 5/22/2006. Status: Closed.

5(c) Agency Recommendations.

- DEQ encourages all projects and facilities to implement pollution prevention principles, including:
    - the reduction, reuse and recycling of all solid wastes generated; and
    - the minimization and proper handling of generated hazardous wastes.
- Evaluate the identified petroleum releases to establish the exact location, nature and extent of the release and the potential to impact the proposed project.
- Further evaluate the identified facility sites for potential impact to the proposed project.

5(d) Requirements.

- Any soil that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations.
- If any solid or hazardous waste is generated/encountered during construction and /or operation of the facility, the project manager and facility manager shall follow applicable federal, state and county regulations for disposal.
- Report evidence of a petroleum release, if discovered during construction of this project, to DEQ VRO.
- Characterize and properly dispose of petroleum-contaminated soils and ground

water generated during the construction of this project.

6. Natural Heritage Resources. The EA (page 10) states that there are three designated State Natural and Scenic Area Preserves in Augusta County but none are within the project vicinity. In addition, the EA (page 9) indicates that significant habitat will not be affected.

6(a) Agency Jurisdiction. The mission of DCR is to conserve Virginia's natural and recreational resources. The DCR Division of Natural Heritage's (DNH) mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act, 10.1-209 through 217 of the Code of Virginia, was passed in 1989 and codified DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

6(b) Agency Findings. According to DCR DNH, the Biotics Data System documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, DCR does not anticipate that this project will adversely impact these natural heritage resources.

6(c) Threatened and Endangered Plant and Insect Species. Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR, DCR has the authority to report for VDACS on state-listed plant and insect species. DCR states that the current activity will not affect any documented state-listed plants or insects.

6(d) Natural Area Preserves. DCR states that there are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

6(e) Agency Recommendation. Contact the DCR DNH for an update on this natural heritage information if a significant amount of time passes before it is utilized since new and updated information is continually added to the Biotics Data System.

7. Wildlife Resources. The EA (page 9) indicates that the proposed project will have no effect on protected species.

7(a) Agency Jurisdiction. DGIF, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state- or federally-listed endangered or threatened species, but excluding listed insects (Virginia Code Title 29.1). DGIF is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 *et seq.*) and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely

impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce or compensate for those impacts. For more information, see the DGIF website at *www.dgif.virginia.gov.*

7(b) Agency Findings. DGIF states that Todd Lake Dam (Dam #10) is located on Skidmore Fork, a tributary of North River. According to DGIF's records, the North River, downstream of the project area, has been designated a stockable trout water. Based on the location of the project, further coordination with DGIF regarding this resource is not necessary.

7(c) Agency Recommendations. DGIF has the following recommendations:

- Drain the lake in a manner that does not significantly increase turbidity and velocities downstream of the dam.
- Ensure that notices are posted in the community for the lake draining and subsequent access restrictions.
- Conduct any in-stream activities during low or no-flow conditions,
    - using non-erodible cofferdams or turbidity curtains to isolate the construction area,
    - blocking no more than 50% of the streamflow at any given time,
    - stockpiling excavated material in a manner that prevents reentry into the stream,
    - restoring original streambed and streambank contours,
    - revegetating barren areas with native vegetation, and
    - implementing strict erosion and sediment control measures.

Contact DGIF (Amy Ewing at *Amy.Ewing@dgif.virginia.gov*) for additional information.

8. Dam Safety. The EA (page 43) states that the primary purpose of the lake is to provide flood protection.

8(a) Agency Jurisdiction. The purpose of the DCR Division of Dam Safety (DDS) is to provide for proper and safe design, construction, operation and maintenance of dams to protect public safety pursuant to the Virginia Dam Safety Act, Article 2, Chapter 6, Title 10.1 (10.1-604 *et seq.*) of the Code of Virginia and Dam Safety Impounding Structure Regulations.

8(b) Agency Comments. The DCR DDS states that it has been actively working with the USDA NRCS and Headwaters Soil and Water Conservation District since October 2011 during the planning process for this project. DCR DDS has no issues concerning the EA.

9. Historic and Architectural Resources.

9(a) Agency Jurisdiction. DHR conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated

State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulation at 36 CFR Part 800. The preservation act requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding. DHR also provides comments to DEQ through the state environmental impact report review process.

9(b) Agency Findings. DHR states that the Todd Lake Dam rehabilitation area was previously subjected to an archaeological survey by the U.S. Forest Service. No cultural resources were identified in the study area. DHR finds that the draft EA accurately details the consultation to date. Furthermore, DHR finds that the March 15, 2011, determination of "no historic properties affected" remains valid. Inclusion of this determination in the final EA, along with DHR's letter of concurrence, will provide the interested public the opportunity to inspect the documentation prior to approval of the undertaking in accordance with 36 CFR 800.4(d)(1) of the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended).

9(c) Agency Recommendation. DHR recommends including its March 15, 2011, determination in the final EA.

Contact DHR (Roger Kirchen at *Roger.Kirchen@dhr.virginia.gov*) for additional information.

10. Public Water Supply.

10(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes).

10(b) Agency Findings. VDH states there are no apparent impacts to public drinking water sources due to this project. No groundwater wells are within a 1,000 mile radius of the project site. One surface water intake is located within a 5-mile radius but is up gradient of the project site. The project is located within Zone 2 (greater than 5 miles into the watershed) for two public surface water sources.

10(c) Requirements. Installation of new water lines and appurtenances must comply with the state's waterworks regulations. VDH administers both federal and state laws governing waterworks operation. Potential impacts to public water distribution systems must be verified by the local utility, according to VDH.

Contact VDH (Barry E. Matthews at 804-864-7515) for additional information, if necessary.

11. Tree Protection. The EA (page 45) indicates that some trees will be removed from the outlet of the auxiliary spillway and borrow area.

11(a) Agency Jurisdiction. The mission of the Virginia Department of Forestry (DOF) is to protect and develop healthy, sustainable forest resources for Virginians. DOF was established in 1914 to prevent and suppress forest fires and reforest bare lands. Since the Department's inception, it has grown and evolved to encompass other protection and management duties including: protecting Virginia's forests from wildfire, protecting Virginia's waters, managing and conserving Virginia's forests, managing state-owned lands and nurseries, and managing regulated incentive programs for forest landowners.

11(b) Recommendations. In general, the DOF recommends that, to the extent feasible, trees should be left in groupings or clusters to provide aesthetic and environmental benefits, as well as reducing costs associated with maintaining open space. The following measures are recommended during construction to protect trees not slated for removal:

- Trees should be marked and fenced at least to the drip line or the end of the root system, whichever extends farther from the stem. Marking should be done with highly visible ribbon so that equipment operators see the protected areas easily.

- Parking and stacking of heavy equipment and construction materials near trees can damage root systems by compacting the soil. Soil compaction, from weight or vibration, affects root growth, water and nutrient uptake, and gas exchange. The protection measures suggested above should be used for parking and stacking as well as for moving of equipment and materials. If parking and stacking are unavoidable, the contractors should use temporary crossing bridges or mats to minimize soil compaction and mechanical injury to plants.

- Any stockpiling of soil should take place away from trees. Piling soil at a tree stem can kill the root system of the tree. Soil stockpiles should be covered, as well, to prevent soil erosion and fugitive dust.

Questions concerning the protection of trees may be addressed to DOF (Buck Kline, Director of the DOF Forestland Conservation Division at *Buck.Kline@dof.virginia.gov* or 434-220-9035).

12. Pesticides and Herbicides. In general, when pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, to the extent feasible, DEQ recommends that the responsible agent for the project use the least toxic pesticides or herbicides effective in controlling the target species. For more information on pesticide or herbicide use, please contact the Virginia Department of Agriculture and Consumer Services at (804) 786-3501.

13. Local and Regional Comments. As customary, DEQ invited Augusta County and the Central Shenandoah Planning District Commission (CSPDC) to comment.

13(a) Jurisdiction. In accordance with the Code of Virginia, Section 15.2-4207, planning district commissions encourage and facilitate local government cooperation and state-local cooperation in addressing, on a regional basis, problems of greater than local significance. The cooperation resulting from this is intended to facilitate the recognition and analysis of regional opportunities and take account of regional influences in planning and implementing public policies and services. Planning district commissions promote the orderly and efficient development of the physical, social and economic elements of the districts by planning, and encouraging and assisting localities to plan for the future.

13(b) Regional Responses. The CSPDC states that it has no comments on the proposed project.

13(c) Local Response. Augusta County did not respond to DEQ's request for comments.

REGULATORY AND COORDINATION NEEDS

1. Water Quality and Wetlands. The USDA NRCS should ensure compliance with DEQ VWP permits and regulations. Questions on the applicability and fulfillment of VWP permit requirements may be addressed to DEQ VRO (Brandon Kiracofe at 540-574-7892 or *Brandon.Kiracofe@deq.virginia.gov*).

2. Erosion and Sediment Control, and Stormwater Management.

2(a) Erosion and Sediment Control. The USDA NRCS and its authorized agents conducting regulated land-disturbing activities equal to or greater than 10,000 square feet must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R) and Virginia Stormwater Management Law and Regulations (VSWML&R). The USDA NRCS also must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan should be submitted to the DCR Staunton Regional Office (540-332-9991) (Reference: VESCL §10.1-567).

2(b) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities. For land-disturbing activities equal to or greater than 1 acre, the owner or operator of construction activities are required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit, and it must address water quality and quantity in accordance with the VSMP Permit Regulations. Specific questions regarding

the Stormwater Management Program requirements should be directed to DCR (Holly Sepety at 804-225-2613) (Reference: VSML §10.1-603.1 *et seq.*; VSMP §4VAC-50 *et seq.*).

3. Air Quality Regulations. The following state air pollution regulations may apply during construction activities:

- fugitive dust and emissions control (9VAC5-50-60 *et seq.*); and
- open burning restrictions (9VAC5-130 *et seq.*).

For information on any local requirements pertaining to open burning, contact officials with Augusta County.

3(a) Fuel-burning Equipment. Contact DEQ VRO (Janardan Pandey at 540-574-7817 or *Janardan.Pandey@deq.virginia.gov*) prior to operation of fuel-burning or other air-pollution-emitting equipment (including generators, wood chippers or grinders).

4. Solid and Hazardous Wastes. All solid waste, hazardous waste and hazardous materials must be managed in accordance with all applicable federal, state and local environmental regulations. Some of the state laws and regulations that may apply are:

- Virginia Waste Management Act (Code of Virginia Section 10.1-1400 *et seq.*);
- Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC20-60);
- Virginia Solid Waste Management Regulations (VSWMR) (9VAC20-81); and
- Virginia Regulations for the Transportation of Hazardous Materials (9VAC20-110).

Some of the applicable federal laws and regulations are:

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations); and
- U.S. Department of Transportation Rules for Transportation of Hazardous materials (49 Code of Federal Regulations Part 107).

Contact DEQ VRO (Graham Simmerman at 540-574-7865) for information on waste management.

4(a) Petroleum Release Reporting. Report evidence of a petroleum release, if discovered during construction of this project, to DEQ VRO (Mac Sterrett at 540-574-7835).

5. Natural Heritage Resources. Contact the DCR DNH at (804)371-2708 for an update on natural heritage information if a significant amount of time passes before the project is implemented.

CONCLUSION

Thank you for the opportunity to review the draft EA. Based on comments submitted by reviewers, DEQ has no objection to the proposed action provided that all applicable local, state and federal laws and regulations are followed. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 698-4325 or Julia Wellman at (804) 698-4326 for clarification of these comments.

Sincerely,

Ellie L. Irons, Program Manager
Environmental Impact Review

Enclosures

cc: Patrick J. Coffield, Augusta County
Bonnie Riedesel, CSPDC

ec: John (Jack) Bricker, USDA NRCS
Amy Ewing, DGIF
Keith Tignor, VDACS
Robbie Rhur, DCR
Steve Coe, DEQ ORP
Kotur S. Narasimhan, DEQ DAPC
Barry Matthews, VDH
David Hartshorn, NRO
Keith Fowler, VRO
Roger Kirchen, DHR

Wellman, Julia (DEQ)

From: Woodward, Justine (MRC)
Sent: Monday, July 02, 2012 2:42 PM
To: Wellman, Julia (DEQ)
Subject: DEQ #12-124F

Hi Julia,

This is a flood control project that is authorized under 28.2-1203 of the Code of Virginia and, therefore, does not require a permit from our agency. Additionally, it is in a section of the waterway with a drainage area less than 5 square miles.

If you have any further questions, please feel free to contact me.

Regards,
Justine

Justine Woodward
Environmental Engineer, Habitat Management Division
Virginia Marine Resources Commission
2600 Washington Ave., 3rd Floor
Newport News, VA 23607
Office: (757) 247-8027
email: justine.woodward@mrc.virginia.gov

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Julia H. Wellman **DEQ - OEIA PROJECT NUMBER: 12 – 124F**

PROJECT TYPE: ☐ STATE EA / EIR **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY CERTIFICATION

PROJECT TITLE: REHABILITATION OF FLOODWATER RETARDING STRUCTURE NO. 10 OF THE UPPER NORTH RIVER WATERSHED

PROJECT SPONSOR: USDA / NATURAL RESOURCES CONSERVATION SERVICE

PROJECT LOCATION: ☐ **OZONE ATTAINMENT AREA**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: **X** **CONSTRUCTION**
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X** **9 VAC 5-130 et seq. – Open Burning**
5. **X** **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis **DATE: July 9, 2012**

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Julia Wellman, DEQ/EIR Environmental Program Planner

FROM: Steve Coe, DLPR Review Coordinator

DATE: July 16, 2012

COPIES: Sanjay Thirunagari, DLP&R Review Manager
EIR File

SUBJECT: EIR Project No. 12-124F- Rehab of Floodwater Retarding Structure No 10 of the Upper North River Watershed, Augusta County – Review Comments

The Division of Land Protection & Revitalization has completed its review of the Environmental Impact Report regarding the Rehabilitation of Floodwater Retarding Structure No 10 of the Upper North River Watershed, Augusta County 24482.

The submittal did not address potential solid and/or hazardous waste issues. The submittal did not include a search of waste-related databases. The DLPR staff has conducted a cursory review of its database files under zip code 24482, including a GIS database search of the project site and determined the information below.

Facility waste sites were located within the same zip code of the proposed project. Although none of the identified sites appeared to be in close proximity to the project site, the potential impact to the project should be further evaluated.

The staff's summary comments are as follows:

Hazardous Waste Facilities – 16, all in the Verona area

The search of the RCRAInfo database under zip code 24482 found sixteen (16) facilities, although none appeared to be in the area of the project.

CERCLA Sites – none

The following websites may prove helpful in locating additional information for these identification numbers: http://www.epa.gov/superfund/sites/cursites/index.htm or http://www.epa.gov/enviro/html/rcris/rcris_query_java.html.

FUDs Sites – none

Solid Waste Facilities – None

VRP Sites - None

Petroleum Release Sites - two

The following petroleum release sites were found on the DEQ's Inventory in the project area:

1) Stokesville Market, 90 North River Road, Solon, VA 22843. ID #s 19901105 and 20086020. Event Dates: 8/31/2007 and 3/14/2006. Status: Closed.
2) White Way Lunch, 2175 Hankey Mountain Highway, Churchville, VA 24421. ID # 19930071. Event Date: 5/22/2006. Status: Closed.

(Note: Dates above are the latest PC Database edit dates of the specific PC Case Nos.)

Please note that the DEQ's PC case files of the PC Case Nos., are identified above and these petroleum releases should be evaluated by the project engineer or manager to establish the exact location of the release and the nature and extent of the petroleum release and the potential to impact the proposed project. The facility representative should contact the DEQ's Valley Regional Office for further information and the administrative records of the PC cases which are in close proximity to the proposed project.

GENERAL COMMENTS

Soil, Sediment, and Waste Management

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/ removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. Questions may be directed to Mr. Graham Simmerman at the Valley Regional Office (540-572-7865).

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Steve Coe, Environmental Specialist, at (804) 698-4029.

Wellman, Julia (DEQ)

From: Fowler, Keith (DEQ)
Sent: Tuesday, July 10, 2012 8:28 AM
To: Fulcher, Valerie (DEQ); Wellman, Julia (DEQ)
Subject: RE: NEW PROJECT - USDA 12-124F

Below are DEQ-VRO comments that may pertain to this project. Please let me know if you have any questions or need any additional information.

1. Water Quality and Wetlands. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers. The Army Corps of Engineers is the final authority for an official confirmation of whether there are jurisdictional wetlands or other surface waters that may be impacted by the proposed project. Review of National Wetland Inventory maps for locating wetlands may not be sufficient; there may need to be a site-specific review of the site by a qualified professional. Even if no water quality impacts are anticipated from the intentional placement of fill material in jurisdictional waters, potential impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). If construction activities will occur in or along any streams (intermittent or perennial), ponds or wetlands, the applicant should contact Brandon Kiracofe at DEQ-VRO (540-574-7892, Brandon.Kiracofe@deq.virginia.gov) to determine the need for any permits prior to commencing work that could impact surface waters or wetlands.

2. Erosion and Sediment Control and Storm Water Management. Non-point source pollution resulting from this project should be minimized by using effective erosion and sediment control practices and structures. Also, denuded areas should be promptly revegetated following construction work. Erosion and sediment control measures are addressed in local ordinances and State regulations. Additional information is available at http://www.dcr.virginia.gov/stormwater_management/e_and_s.shtml. If the total land disturbance exceeds 10,000 square feet, an erosion and sediment control plan will be required. A storm water management plan may also be required. The Virginia Department of Conservation and Recreation (DCR) has regulatory authority for the Virginia Pollutant Discharge Elimination System (VPDES) programs related to municipal separate storm sewer systems (MS4s) and construction activities. For any land disturbing activities equal to one acre or more, you are required to apply to DCR for registration coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities. Specific questions regarding the Storm Water Management Program requirements should be directed to Mr. Eric Capps at DCR (804-786-3957, Eric.Capps@dcr.virginia.gov).

3. Air Quality. Fugitive dust generated during construction must be controlled in accordance with DEQ regulations. This may require, but is not limited to, measures such as the prompt removal of spilled or tracked dirt or other materials from paved streets, limited application of water to suppress dust, and washing of construction vehicles and paved roadways immediately adjacent to construction sites. 9 VAC 5-50 et seq. governs abatement of visible emissions and fugitive dust emissions. Do not use water for dust control to the extent that it results in runoff to surface waters or wetlands. Land clearing wastes (vegetative debris) generated during construction should be properly managed in accordance with applicable regulations and local ordinances. Shredding/chipping of vegetative debris and reuse on-site is usually recommended over open burning. Any open burning of vegetative debris must be performed in accordance with the Open Burning Regulation and coordinated with the local fire official to ensure that all local ordinances are met. A copy of DEQ's open burning regulation and related information are accessible from http://www.deq.virginia.gov/Programs/Air/OpenBurning.aspx. Also, no open burning should take place in violation of the Virginia Waste Management Regulations, http://leg1.state.va.us/000/reg/TOC09020.HTM. Contact Keith Fowler at DEQ-VRO (540-574-7812, Keith.Fowler@deq.virginia.gov) for any questions related to the proper control of fugitive dust, or open burning requirements and prohibitions.

Installation / operation of any fuel burning equipment (e.g., generators, wood chippers/grinders, etc.) or other sources of air pollutants may be subject to registration and/or air permitting requirements; for questions regarding this, please contact Janardan Pandey at DEQ-VRO (540-574-7817, Janardan.Pandey@deq.virginia.gov). If a petroleum storage tank is to be utilized, registration with DEQ may be required for that as well; for questions regarding this, please contact Kathy Willis at DEQ-VRO (540-574-7895, Katherine.Willis@deq.virginia.gov).

4. Solid and Hazardous Wastes, and Hazardous Substances. DEQ administers the Virginia Waste Management Regulations, http://leg1.state.va.us/000/reg/TOC09020.HTM. All solid wastes, hazardous wastes, and hazardous materials, including construction and demolition (C&D) wastes and universal wastes (batteries, fluorescent lights, refrigerants, mercury switches, mercury thermostats, etc.), must be managed in accordance with all applicable federal,

state, and local environmental regulations. The generation of hazardous wastes should be minimized and solid wastes generated at the site should be reduced at the source, reused, or recycled. Also, if you encounter any improperly disposed solid or hazardous wastes, or petroleum contaminated soils, you should contact DEQ-VRO. You may wish to refer to the web link for "What's in My Back Yard?", http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx, to help you determine areas where residual contamination may be more likely. Contact Graham Simmerman at DEQ-VRO (540-574-7865, Graham.Simmerman@deq.virginia.gov) for any questions related to management / disposal of C&D / universal wastes. Manage / dispose of any asbestos-containing materials (ACMs) in accordance with Virginia Department of Labor and Industry (DOLI) regulations. Contact Doug Wiggins at DOLI (Richard.Wiggins@doli.virginia.gov, 540-562-3580, ext. 131) for any questions related to management / disposal of ACMs. Any open burning must be conducted in compliance with the Open Burning Regulation, 9 VAC5 Chapter 130. Contact Keith Fowler at DEQ-VRO (540-574-7812, Keith.Fowler@deq.virginia.gov) for any questions related to open burning requirements and prohibitions. If petroleum-contaminated soils are encountered during excavation work, contact Mac Sterrett at DEQ-VRO (540-574-7835, Mac.Sterrett@deq.virginia.gov).

5. Pesticides and Herbicides. DEQ recommends that herbicides or pesticides for construction or landscape maintenance, when necessary, be used in accordance with the principles of integrated pest management, and that the least toxic pesticides that are effective in controlling the target species be used. Please contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information. If applying aquatic pesticides to surface waters, the applicant must comply with the DEQ's Pesticide General Permit, http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/PermitsFees.aspx#pest .

6. Natural Heritage Resources. The Virginia Department of Conservation and Recreation (DCR) Division of Natural Heritage (DNH) can search its Biotics Data System for occurrences of natural heritage resources from the area indicated on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered animal and plant species, unique or exemplary natural communities, and significant geologic communities. We recommend that the DNH be contacted at (804) 786-7951 to secure updated information on natural heritage resources before commencing the project.

7. Wildlife Resources. The Virginia Department of Game and Inland Fisheries (DGIF) exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species. DGIF determines likely impacts on fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts. For more information, see the DGIF website at http://www.dgif.virginia.gov or contact Ray Fernald at (804) 367-6913.

8. Historic and Archaeological Resources. *Section 106 of the National Historic and Preservation Act of 1966*, as amended, requires that activities that receive federal funding must consider effects to properties that are listed or eligible for listing on the National Register of Historic Places. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources. If applicable, contact DHR. In the event that archaeological resources are encountered during construction, immediately contact Ms. Ethel Eaton, DHR, at (804) 367-2323.

9. Pollution Prevention. DEQ recommends that construction projects incorporate the principles of pollution prevention including the following recommendations:

- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content and toxicity level should be considered.
- Consider contractors' commitment to the environment when choosing contractors. Also, specifications regarding raw material selection (alternative fuels and energy sources) and construction practices can be included in contract documents and requests for proposals.
- Choose sustainable practices and materials in infrastructure and construction and design. These could include asphalt and concrete containing recycled materials and integrated pest management in landscaping.
- Integrate pollution prevention techniques into maintenance and operation activities to include source reduction (fixing leaks, energy efficient products).

Pollution prevention measures are likely to reduce potential environmental impacts and reduce costs for material purchasing and waste disposal. For more information, please visit our web site at http://www.deq.virginia.gov/Programs/PollutionPrevention.aspx.

10. Energy Conservation. Any structures should be planned and designed to comply with state and federal guidelines and industry standards for energy conservation and efficiency. For example, energy efficiency of the structures can be enhanced by maximizing the use of the following:

- thermally-efficient building shell components (roof, wall, floor, and insulation);

- high efficiency heating, ventilation, air conditioning systems; and
- high efficiency lighting systems.

Matt Heller at the Department of Mines, Minerals and Energy, (434) 951-6351, may be contacted for assistance in meeting this challenge.

11. Waterworks Operation. Installation of new water lines and appurtenances must comply with the State's Waterworks Regulations. The Virginia Department of Health (VDH) administers both federal and state laws governing waterworks operation. For more information, contact the VDH's Lexington Office of Water Programs at (540) 463-7136.

12. Wastewaters. DEQ has approval authority over plans and specifications for sewage collections systems and treatment works (except drainfields and other on-site systems approved by the local health department). This authority is contained in the Sewage Collection and Treatment (SCAT) Regulations (12 VAC 5-581). Also, any wastewaters generated from washing vehicles or other practices relevant to this project must be properly managed and disposed. For additional information and assistance, contact Brandon Kiracofe, DEQ-VRO (540-574-7892, Brandon.Kiracofe@deq.virginia.gov).

B. Keith Fowler | Deputy Regional Director | DEQ-Valley Regional Office | 4411 Early Road | P. O. Box 3000 | Harrisonburg, VA 22801 | 540-574-7812 | Keith.Fowler@deq.virginia.gov

---

From: Fulcher, Valerie (DEQ)
Sent: Thursday, June 28, 2012 3:05 PM
To: Cason, Gladys (DGIF); Rhur, Robbie (DCR); Coe, Stephen (DEQ); Ballou, Thomas (DEQ); Fowler, Keith (DEQ); Watkinson, Tony (MRC); Kirchen, Roger (DHR)
Cc: Wellman, Julia (DEQ)
Subject: NEW PROJECT - USDA 12-124F

Good afternoon - attached is a new EIR review request:

USDA/NRCS: Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, DEQ #12-124F

Here is the link to the document:

ftp://ftp-fc.sc.egov.usda.gov/VA/Programs/watershed_info/Upper%20North%20River%20No%2010%20(Todd%20Lake)%20Draft%20Plan%20and%20Environmental%20Assessment.pdf

The due date for comments to DEQ is JULY 16, 2012. You can send your comments either directly to Julia by email (Julia.Wellman@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to OEIR, 629 E. Main St., 6th Floor, Richmond, VA 23219. If you have any questions, please email Julia.

Thanks!

Valerie

Valerie A. Fulcher, CAP-OM, Executive Secretary Sr.

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

629 E. Main St., 6th Floor

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
(804) 786-1712

MEMORANDUM

DATE: July 16, 2012

TO: Julia Wellman, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 12-124F, Upper North River Watershed, Todd Lake Dam Rehab

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Division of Stormwater Management

The applicant and their authorized agents conducting regulated land disturbing activities on private and public lands in the state must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R), Virginia Stormwater Management Law and Regulations including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, Federal Consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbance activities that result in the land-disturbance of equal to or greater than 10,000 square feet would be regulated by VESCL&R. Accordingly, the applicant must prepare and implement erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan is submitted to the DCR Regional Office that serves the area where the project is located for review for compliance. The applicant is ultimately responsible for achieving project compliance through oversight of on site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: VESCL §10.1-567;].

The operator or owner of construction activities involving land disturbing activities equal to or greater than one acre are required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). Construction activities requiring registration also includes the land-disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will ultimately disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the Virginia Stormwater Management Program (VSMP) Permit Regulations. General information and registration forms for the General Permit are available on DCR's website at
http://www.dcr.virginia.gov/soil_and_water/index.shtml
[Reference: Virginia Stormwater Management Law Act §10.1-603.1 et seq.; VSMP Permit Regulations §4VAC-50 et seq.]

Division of Dam Safety

DCR's Division of Dam Safety has been actively working with NRCS and the Headwaters District since October 2011 during the planning process for this project. We have no issues concerning the Report or the Project.

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Wellman, Julia (DEQ)

From: Ewing, Amy (DGIF)
Sent: Wednesday, July 18, 2012 1:38 PM
To: Wellman, Julia (DEQ)
Cc: Cason, Gladys (DGIF); nhreview (DCR); Bugas, Paul (DGIF)
Subject: ESSLog# 33036_12-124F_EA_Rahab of Dam 10 (Todd Lake)

We have reviewed the subject project that proposes to rehabilitate Todd Lake Dam (Dam #10) located on Skidmore Fork, a tributary of North River.

According to our records, North River, downstream of the project area, has been designated a stockable trout water. Based on the location of the project, further coordination with us regarding this resource is not necessary.

We recommend draining the lake in a manner that does not significantly increase turbidity and velocities downstream of the dam. Further, we recommend that lake draining and subsequent access restrictions be appropriately noticed within the community.

We recommend conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures.

Thanks, Amy

Amy Ewing
Environmental Services Biologist
VA Dept. of Game and Inland Fisheries
4010 W. Broad Street
Richmond, VA 23230
804-367-2211
amy.ewing@dgif.virginia.gov

Wellman, Julia (DEQ)

From: Kirchen, Roger (DHR)
Sent: Monday, July 02, 2012 11:35 AM
To: jack.bricker@va.usda.gov
Cc: Jones, Jeffray - Richmond, VA; Madden, Michael J -FS; Wellman, Julia (DEQ)
Subject: Todd Lake Dam Rehabilitation (DHR File No. 2011-0306: DEQ #12-124F)
Attachments: 2011-0306_02JUL12.pdf

Please see attached for DHR comments on the referenced project and print for your files. No hardcopy to follow.

Roger

Roger W. Kirchen, Archaeologist
Office of Review and Compliance
Division of Resource Services and Review
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221
phone: 804-482-6091 (NEW!)
fax: 804-367-2391
roger.kirchen@dhr.virginia.gov

COMMONWEALTH of VIRGINIA

Douglas W. Domenech
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

July 2, 2012

Mr. John A. Bricker, State Conservationist
USDA – NRCS
1606 Santa Rosa Rd., Suite 209
Richmond, Virginia 23229-5014

Re: *Draft Supplemental Watershed Plan No. 6 & Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, Augusta County, Virginia*
DHR File No. 2011-0306; DEQ #12-124F

Dear Mr. Bricker:

We have received the above-referenced document for review. The Todd Lake Dam rehabilitation area was previously subjected to an archaeological survey by the U.S. Forest Service. No cultural resources were identified in the study area.

We find that the draft Environmental Assessment accurately details the consultation to date. Furthermore, we find that the March 15, 2011 determination of *no historic properties affected* remains valid. Inclusion of this determination in the final EA, along with our letter of concurrence, will provide the interested public the opportunity to inspect the documentation prior to approval of the undertaking in accordance with 36 CFR 800.4(d)(1) of the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended).

If you have any questions concerning these comments or our review of this project, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

c. Mr. Michael J. Madden, USFS
Ms. Julia H. Wellman, DEQ-OEIR

Administrative Services
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 862-6416
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way
2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5428
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
P.O. Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Wellman, Julia (DEQ)

From: Matthews, Barry (VDH)
Sent: Monday, July 23, 2012 8:29 AM
To: Wellman, Julia (DEQ)
Subject: Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed (12-124F)

DEQ Project #: 12-124F
Name: Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed
Sponsor: USDA/NRCS
Location: Augusta County

VDH – Office of Drinking Water has reviewed DEQ Project Number 12-124F. Below are our comments as they relate to proximity to **public drinking water** sources (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

No groundwater wells are within a 1,000 mile radius of the project site.

One surface water intake is located within a 5 mile radius, but is up gradient of the project site.

The project is located within Zone 2 (greater than 5 miles into the watershed) for two public surface water sources.

There are no apparent impacts to public drinking water sources due to this project.

Diedre Forsgren
Office Services Specialist
VIRGINIA DEPARTMENT OF HEALTH
Office of Drinking Water, Room 622-A
109 Governor Street
Richmond, VA 23219
Phone: (804) 864-7241
email: diedre.forsgren@vdh.virginia.gov

If you cannot meet the deadline, please notify JULIA H. WELLMAN at 804/698-4326 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. JULIA H. WELLMAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319
Julia.Wellman@deq.virginia.gov

JULIA H. WELLMAN
ENVIRONMENTAL PROGRAM PLANNER

COMMENTS

No comments

(signed) Bonnie S. Riedesel (date) 7-13-12

(title) Executive Director

(agency) CSPDC
Central Shenandoah PDC

PROJECT #12-124F **1/12**

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1737

July 27, 2012

Ms. Ellie L. Irons, Manager
Office of Environmental Impact Review
Commonwealth of Virginia
Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Ms. Irons:

Thank you for providing the Commonwealth's consolidated comments on the referenced project. We also received individual comments from Augusta County, the Headwaters Soil and Water Conservation District, the Virginia Marine Resources Commission, the Virginia Department of Conservation and Recreation's Division of Natural Heritage, and the Virginia Department of Historic Resources. It is acknowledged that the Department of Environmental Quality has no objection to the proposed action provided that all applicable local, state, and federal laws and regulations are followed.

Since most of the comments address issues that are required during the implementation process, they will be addressed during the design, permitting, and/or construction phases of this project. It is very helpful to have this comprehensive listing of the State's requirements in your letter, and we appreciate your support of this project.

If questions or concerns arise as the project proceeds, Jeffray Jones, the Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

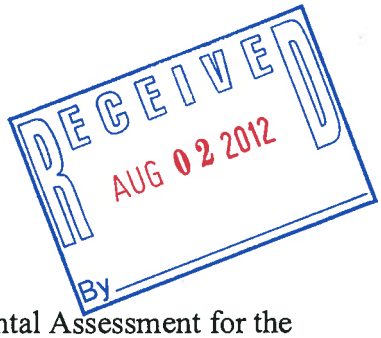
JOHN A. BRICKER
State Conservationist

CC: Wade
Jeff

USDA United States Department of Agriculture | Forest Service | George Washington & Jefferson National Forests | 5162 Valleypointe Parkway Roanoke, VA 24019-3050 540/265-5100

File Code: 7510
Date: July 30, 2012

Mr. John Bricker
State Conservationist
USDA - Natural resources Conservation Service
1606 Santa Rosa Road
Suite 209
Richmond, VA 23229-5014



Dear Mr. Bricker:

Thank you for the opportunity to provide comments on the Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 10 of the Upper North River Watershed, Augusta County, VA. Locally referred to as Todd Lake Dam, on the North River Ranger District, George Washington and Jefferson National Forests, our comments to the proposed alternative are as follows:

Page 17 of the Environmental Assessment provides for a camera survey of the Sewer Line which passes through the Dam at the time of the principal spillway survey. We recommend testing for leaks after all construction work is completed and prior to re-filling of the lake to be certain construction activities have not caused problems.

We are unable to determine if the amount of fill used to raise the dam height 5.5 feet (estimated at 45,800 cubic yards – Fig. D-1) will reduce the water surface area at normal pool. Normal pool is currently 5.8 acres.

On page 35 the EA states, "Construction Access- Forest Service Road 95 is paved from Stokesville to the Site." "All of the anticipated construction zone is within the area included in the Special Use Permit that the U.S. Forest Service has issued to the Sponsors. This Special Use Permit will be renewed prior to construction." Alternative 1 will require 45,800 cubic yards of earthen fill material (Fig. D-1). The source of the fill material is not identified. The Environmental Assessment needs to address the impacts of hauling fill material on FR 95 from the source of the fill material to the construction site. The heavy truck traffic over Forest Service Road 95 will probably necessitate repaving of the road, after construction.

Should you have any questions, please contact District Ranger Elwood Burge at 540-432-0187.

Sincerely,

H. THOMAS SPEAKS, JR.
Forest Supervisor

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229-5014

Telephone: 804/287-1691
Fax: 804/287-1737

August 6, 2012

Mr. H. Thomas Speaks, Jr.
Forest Supervisor
George Washington and Jefferson National Forest
5162 Valley Pointe Parkway
Roanoke, VA 24019

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the Rehabilitation of Upper North River Watershed Dam No. 10 (Todd Lake), Augusta County, Virginia

Dear Mr. Speaks:

Thank you for your response to the referenced Draft EA submitted to your office for review. We appreciate the cooperating agency partnership we have with USDA-Forest Service on this project. We also appreciate the time and consideration given to reviewing the Plan. Based upon your comments, the description of the preferred alternative was modified to address the water surface area of the normal pool, potential need for fill material, and potential damages to FR 95.

With the proposed alternative, the surface area of the lake would decrease by about 0.2 acres and the volume of the floodwater detention storage would decrease by about 1%. This will not affect the function of the dam. NRCS anticipates using the existing borrow pits to the maximum extent possible. If additional fill is needed, the contractor will haul fill material from an off-site location. Prior to construction, FR 95 will be videotaped for existing conditions. This video will be compared to the post-construction survey. Any damages identified after comparing pre- and post-construction surveys will be repaired.

The preferred alternative describes one possible combination of widening the auxiliary spillway and raising the top of the dam. When this is paired with the use of the secant pile wall, the proposed solution will address all the requirements for the stability, integrity, and capacity of the auxiliary spillway. As noted in the Plan, there are other combinations that could also be used. One possibility that has been identified since the plan was written involves widening the auxiliary spillway toward the road and raising the top of the dam by a lesser amount. With this alternative, the road would be relocated slightly away from the dam. By moving the road and widening the auxiliary spillway, the additional fill needed to raise the dam could be available on-site. This could eliminate potential damages to FR-95.

As part of the data gathering for the design phase, NRCS will complete a pre-construction camera survey of the sewer line to document existing conditions. If needed, a post-construction evaluation of the sewer line will be done.

During the design phase of the project, NRCS, in conjunction with an Architectural/Engineering contractor, the U. S. Forest Service and the project Sponsors, will further evaluate the most cost-effective and technically sound design for this project. If questions or concerns arise as the project proceeds, Jeffray Jones, Watershed Programs Coordinator, can be reached by e-mail at jeffray.jones@va.usda.gov or by phone at 804-287-1636.

Sincerely,

W. Ray Dusatt

JOHN A. BRICKER
Acting For State Conservationist

cc: Elwood Burge, District Ranger, North River Ranger District
Charles Ivins, NRCS District Conservationist, Verona
Louis Heidel, NRCS ASTC (Field Operations), Harrisonburg

APPENDIX B

PROJECT MAPS

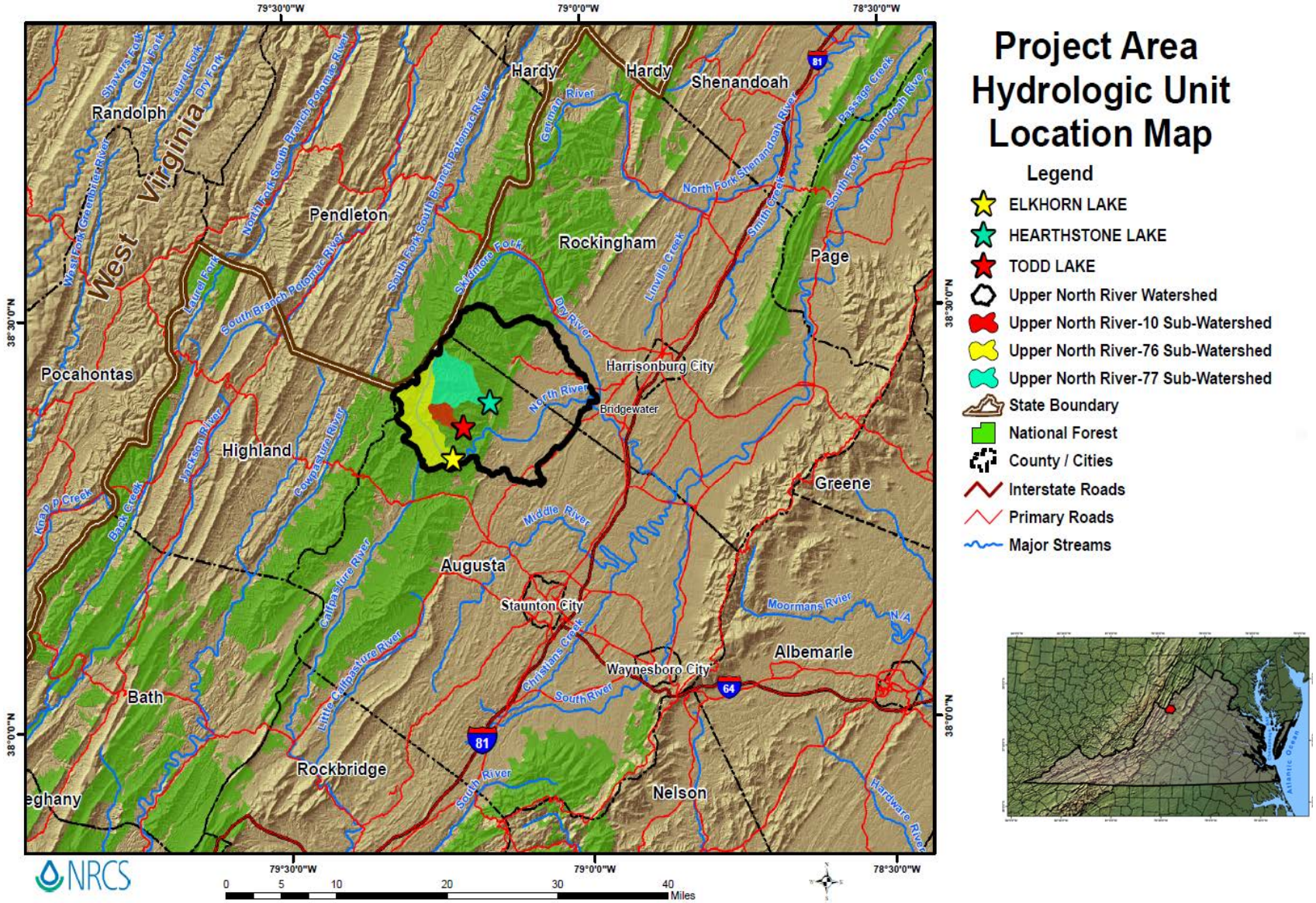


Figure B1. Location map.

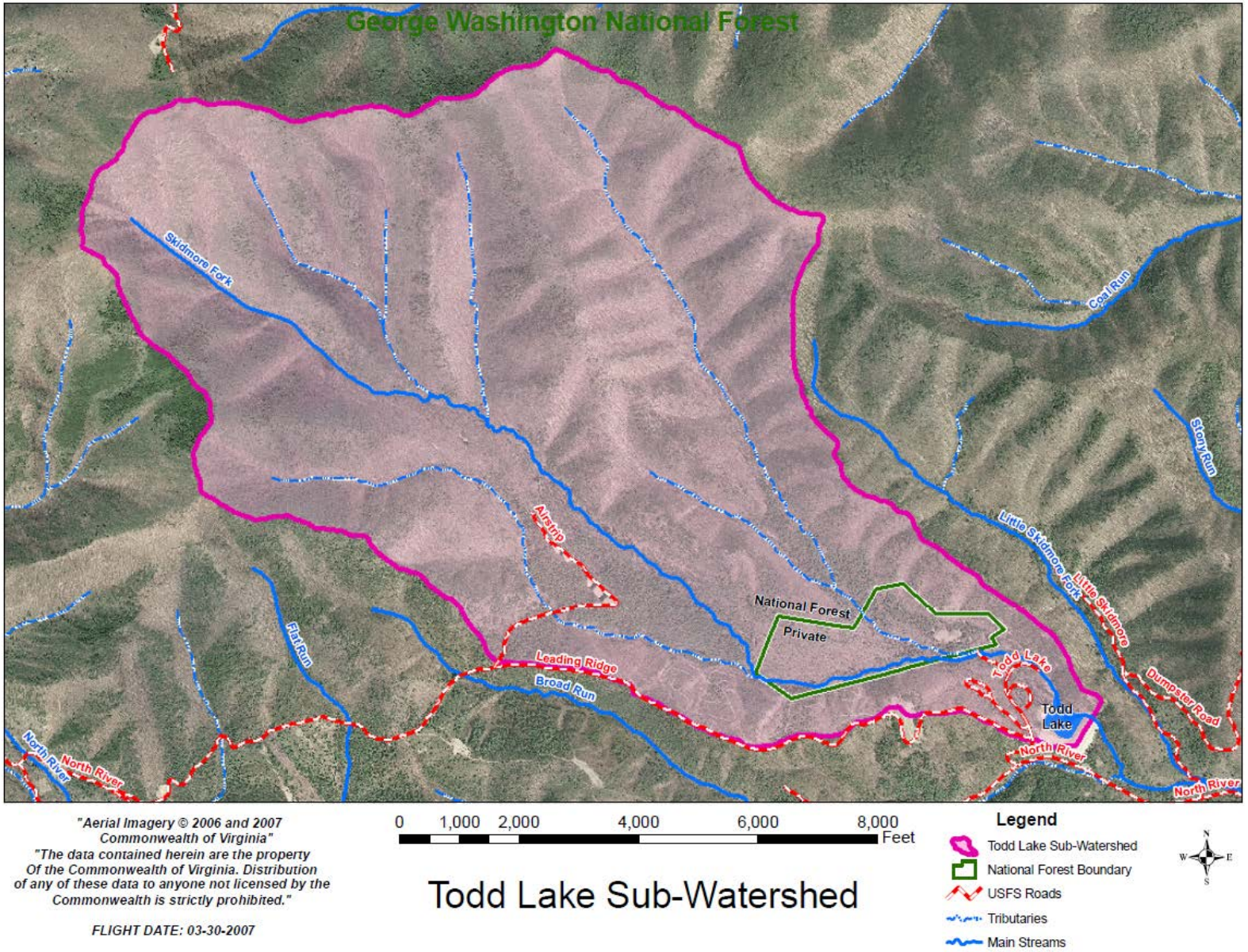


Figure B2. Todd Lake Subwatershed.

Figure B3. Aerial view of lake, drained.

APPENDIX C

SUPPORT MAPS

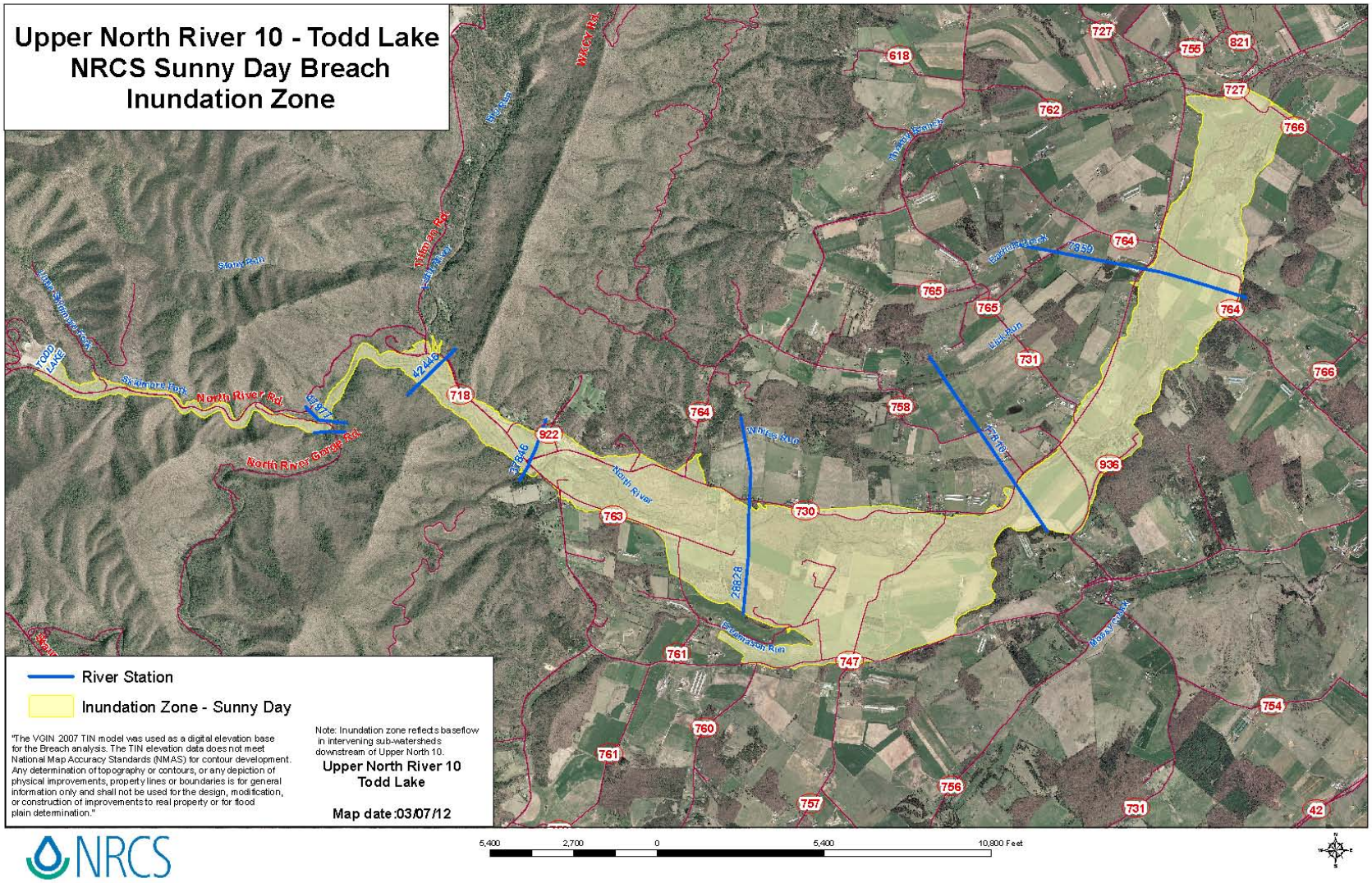


Figure C1. Sunny Day Breach Inundation Map.

Table C1 - Depth of Water Flow over Bridges during Flooding Events (feet)

Stream Crossing	100-year	200-year	500-year	1000-year	Sunny Day Breach of Todd Lake
Stokesville Road (SC 730)	-*	2.4	5.5	6.9	8.4
Natural Chimneys Road (SC 731)	-*	0.2	0.7	1.1	-*
Towers Road (SC 764)	2.0	2.4	2.8	3.1	2.0
Reeves Road (SC 766)	3.2	3.6	4.0	4.2	3.1

*Beneath the road

Table C2 - Results of a Dam Breach Routing for Todd Lake

Reach	Location Description	River Station (#)	Drainage Area (mi^2)	Channel Bottom Elevation (ft)	Sunny Day Breach Water Surface Elevation (ft)	Maximum Discharge (cfs)
Skidmore Fork	Downstream of Todd Lake	9770	3.85	1836.32	1856.42	70200
North River / Upper	Confluence of Skidmore Fork and North River	47977	38.88	1610.85	1631.95	56980
	Confluence of Little River and North River, apx. 1,000 ft, downstream of Girl Scout camp.	42445	64.98	1550.26	1561.36	42412
	Town of Stokesville	37846	65.77	1513.02	1532.41	27411
North River / Lower	Confluence of unnamed tributary, 1.7 miles downstream of Stokesville	28828	67.22	1445.98	1453.61	24583
	Confluence of North River and Freemason Run	17810	76.82	1359.05	1368.25	18981
	Apx. 1,000 ft upstream of Towers Road,	7859	79.27	1307.34	1315.21	15440

APPENDIX D

ALTERNATIVES

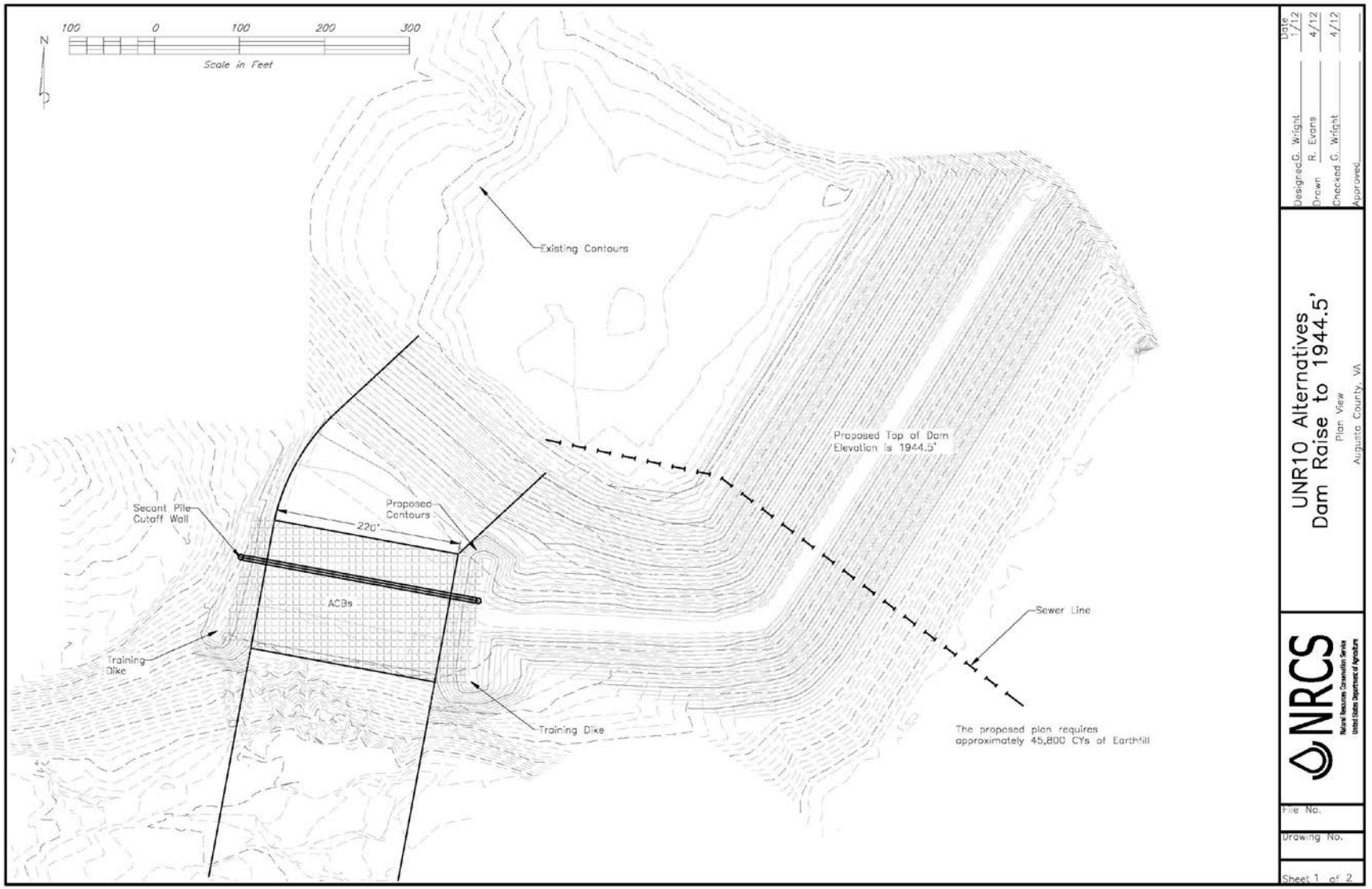


Figure D1. Plan view of site with a secant pile wall, ACB armor, and earthfill for the dam raise (Preferred Alternative).

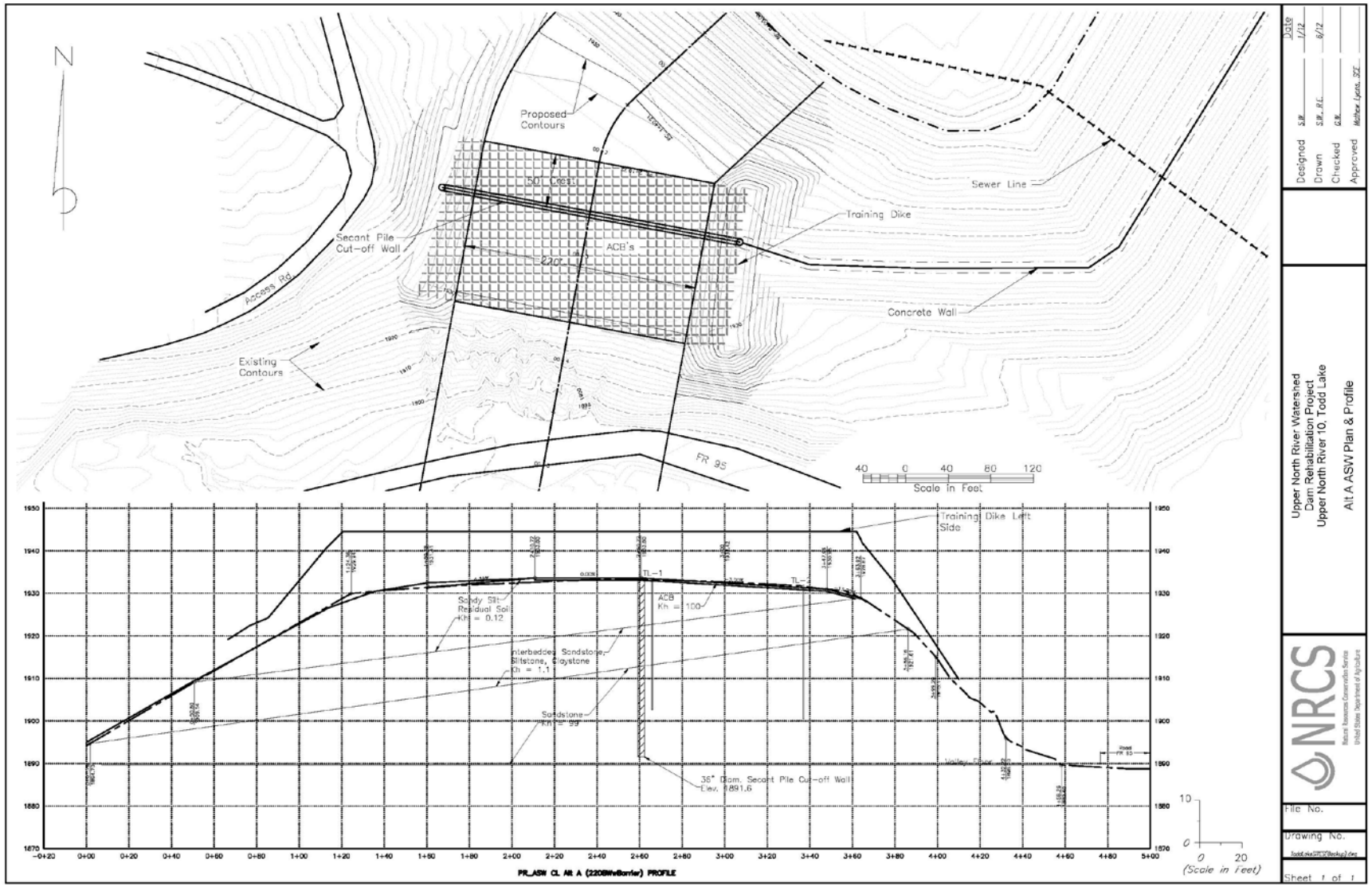


Figure D2. Plan view of site with a secant pile wall, ACB armor, and a parapet wall for the dam raise.

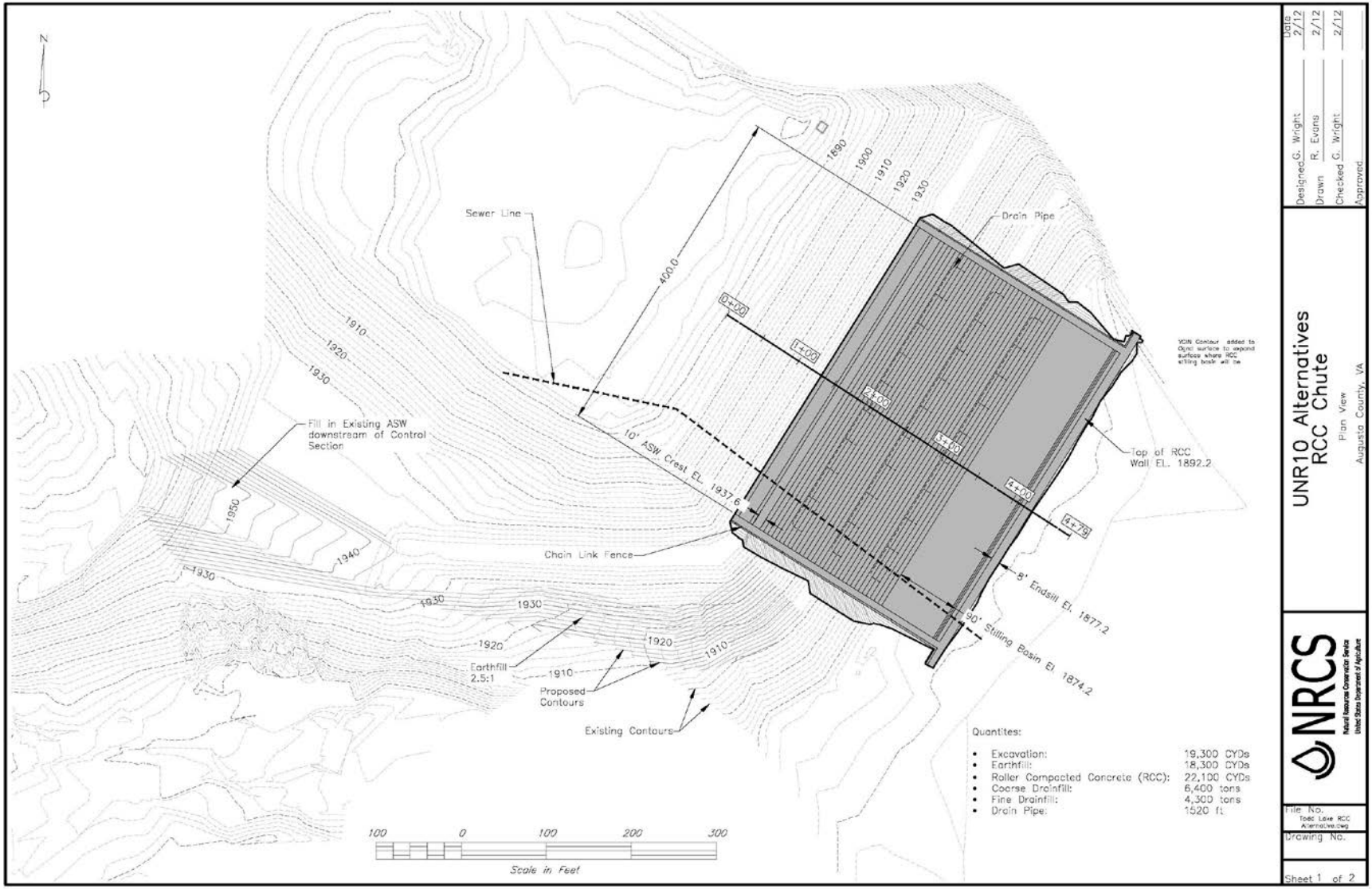


Figure D3. Plan view of site with a Roller-Compacted Concrete Chute auxiliary spillway.

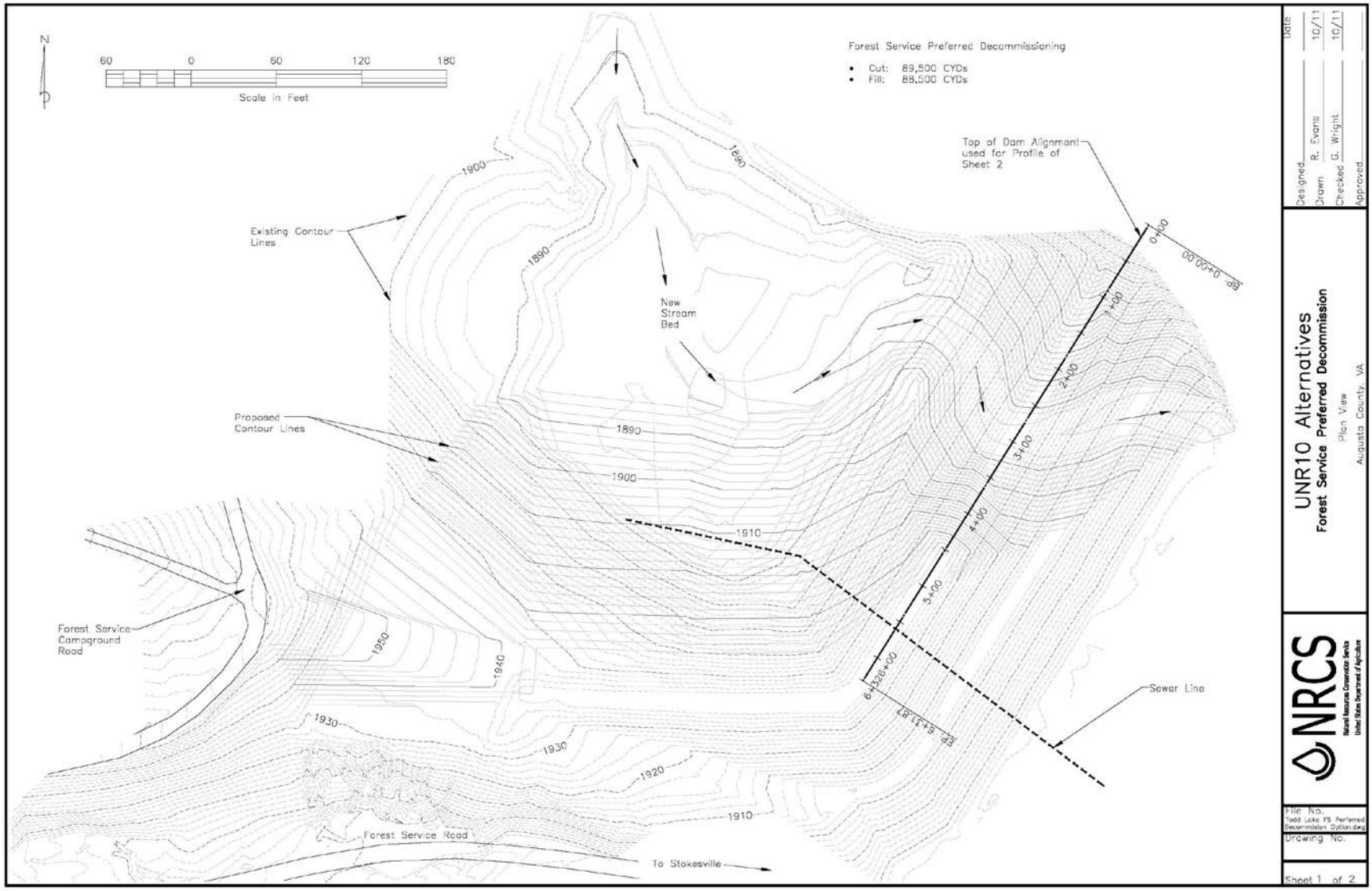


Figure D4. Plan view of site with partial decommissioning of the embankment.

APPENDIX E

Biological Evaluation/Biological Assessment

Biological Evaluation/Biological Assessment for
Threatened, Endangered, and Sensitive Species

Todd Lake Dam Rehabilitation

North River Ranger District
Augusta County, Virginia
George Washington and Jefferson National Forests

Introduction

Forest Service Manual (FSM) Section 2672.41 requires a biological evaluation (BE) and/or biological assessment (BA) for all Forest Service planned, funded, executed, or permitted programs and activities. The objectives of this BE/BA are to: 1) ensure that Forest Service actions do not contribute to trends toward federal listing, 2) comply with the requirements of the Endangered Species Act (ESA) so that federal agencies do not jeopardize or adversely modify critical habitat (as defined in ESA) of federally listed species, 3) provide a process and standard to ensure that threatened, endangered, proposed, and sensitive (TES) species receive full consideration in the decision-making process, and 4) based on best available science.

The North River Ranger District (District) supports known occurrences and suitable habitat for several TES species, all of which were considered in this analysis. This BE/BA documents the analysis of potential effects of the proposed project to TES species and associated habitat. It also serves as biological input into the environmental analysis for project-level decision making to ensure compliance with the ESA, National Environmental Policy Act (NEPA), and National Forest Management Act (NFMA).

The Natural Resources Conservation Service, U. S. Department of Agriculture, proposes to rehabilitate Todd Lake dam to better protect communities downstream in the event of a flood. Because the dam has been upgraded to a high hazard dam, it must now stand up to the probable maximum flood. Several activities are being considered to bring the dam up to standard. Also being considered is decommissioning or partial removal of the dam and restoring the natural contour of the land.

Project Area and Cumulative Effects Analysis Area

The project area is located in the Skidmore Fork watershed in Augusta County, Virginia. The project area includes Todd Lake, the dam, spillway and surrounding areas. It also includes the borrow area west of the lake along Leading Ridge Road. Vegetation in open areas of the dam, spillway and borrow area includes grasses, sedges, flowers, shrubs, and scattered trees. Vegetation on the surrounding forested area consists predominantly of stands of upland hardwoods, yellow pines and white pine. Elevations range from 1896’ at the lake to 2200’ at the borrow area. The entire project area is located on National Forest System (NFS) land.

The geographic scope of this biological analysis for terrestrial plants and animals is the project area. The geographic scope of the analysis for the Indiana bat is the entire George Washington and Jefferson National Forests (GWJNF). The geographic scope of this biological analysis for

aquatic species includes the Skidmore Fork watershed in the vicinity of the project area downstream to its confluence with the North River.

The aquatic geographic scope was selected because the Forest Hydrologist determined that the area drained by Skidmore Fork above Todd Lake is approximately 3.86 sq. mi. The area drained by the North River below its confluence with Skidmore Fork is 38.9 sq. mi., or approximately 10 times as much. Therefore, sediment produced by the project will be greatly diluted upon mixing with the North River.

Proposed Management Action(s)

The following alternatives are being considered:

1. Full Decommission with Mitigation.
2. Partial Decommission with Mitigation.
3. Structural Rehabilitation – widen the auxiliary spillway 20 ft; install a secant pile wall down into the auxiliary spillway and raise the dam 5.5 ft – raise dam with a concrete parapet wall. Replace existing principal spillway riser.
4. Structural Rehabilitation – widen the auxiliary spillway 20 ft; install a secant pile wall down into the auxiliary spillway and raise the dam 5.5 ft – raise dam with earthen fill. Replace existing principal spillway riser.
5. Structural Rehabilitation – install roller compacted concrete chute over the top of dam, fill in old auxiliary spillway. No top of dam raise. Replace existing principal spillway riser.

All of the above alternatives were considered in the preparation of this BE/BA. The attached aerial photo displays all of the areas that could be disturbed by any of the various alternatives.

Future Actions

Other than the proposed actions described, there are no foreseeable future projects planned on National Forest System (NFS) land within the project analysis area that may have an effect on terrestrial or aquatic plants and animals.

Species Reviewed

Federally listed threatened and endangered species, species proposed for federal listing and Southern Region sensitive (TES) species that may potentially be affected by this project were examined using the following existing available information:

1. Reviewing the list of TES plant and animal species known or likely to occur on the George Washington and Jefferson National Forests, and their habitat preferences. This review included the current list of federal endangered, threatened, and proposed species for the Forest, concurred with by the USFWS on January 4, 2007, and the January 1, 2002 Southern Region Sensitive Species list, revised for known or possible Forest occurrences on March 4, 2004 (list attached as Appendix A) with Forest-specific updates current as of April 1, 2011.

2. Consulting element occurrence records (EOR's) for TES species as maintained by the Virginia Division of Natural Heritage (VDNH), and supplied to the Forest.

3. Consulting species information, including county occurrence records, as maintained in the online database (http://vafwis.org/fwis/?Menu=Home.Visitor+Options) titled Virginia Fish and Wildlife Information Service (VAFWIS) of the Virginia Department of Game and Inland Fisheries (VDGIF).

4. Consulting with individuals in the private and public sector who are knowledgeable about the area and its flora and/or fauna.

5. Reviewing sources listed in the reference portion of this report.

6. Reviewing the results of past field surveys that may have been conducted in the area.

Most TES species known to occur on the Forest have unique habitat requirements, such as shale barrens, rock outcrops, bogs, caves, and natural ponds. Information gathered, analyzed, and presented in the Southern Appalachian Assessment dated July 1996 states that approximately 84% of threatened and endangered species and 74% of sensitive species are associated with rare or unique habitats, often referred to as rare communities.

Through cooperative agreements between the Forest and VDNH, Special Biological Areas (SBA) have been identified and delineated on the Forest. These include rare and significant natural communities and vegetative types along with the rare species they support. These areas reflect current knowledge of the location, management, and protection needs of rare species and associated significant natural communities on the Forest. These areas are identified in the George Washington Forest Plan as Special Interest Areas/Research Natural Areas (Management Area 4) and in a supplemental report from VDNH, dated July 2000 (Wilson, 2000), which identifies additional areas (called Conservation Sites by VDNH) for consideration as Special Biological Areas. A review of these Special Biological Area reports determined that no Special Biological Areas occur in the project area.

Appendix A of this document lists all 190 TES species currently known, or expected to occur, on or near the George Washington and Jefferson National Forests. All species on the list were considered during the analysis for this project.

A "step down" process was followed to eliminate species from further analysis and focus on those species that may be affected by proposed project activities. Species not eliminated are then analyzed in greater detail. Results of the "step down" analysis process are displayed in the Occurrence Analysis Results (OAR) column of the table in Appendix A. First, the range of a species was considered. Species' ranges on the Forest are based on county records contained in such documents as the Atlas of the Virginia Flora, but are refined further when additional information is available, such as more recent occurrences documented in scientific literature or in Natural Heritage databases. Many times range information clearly indicates a species will not occur in the project area due to the restricted geographic distribution of most TES species. When the project area is outside a known species range, that species is eliminated from further consideration by being coded as OAR code "1" in the Appendix A table. For this project, 152

species were eliminated from further consideration because the project area is not within the species known range.

For the remaining species, after this first step, a field survey was conducted to determine if suitable habitat or the species were present in the activity area.

Field Survey and Results

Since some species could not be eliminated from further consideration based on known range, and because there are no current field surveys in the project area, a field survey was necessary to determine the presence or absence of TES species and/or habitats. The following is a record of the field survey of the project area:

- 4/15/11- Terry Slater (USFS District Biologist) surveyed entire project area
- 6/24/11- Terry Slater again surveyed entire project area

The field survey on the dates listed above was conducted specifically for the proposed Todd Lake Dam Rehabilitation Project. In addition, other USFS personnel and State Biologists are familiar with the project area because of their involvement in various projects in and around Todd Lake in the past. Additional input and review was provided by Richard Patton (USFS Forest Hydrologist) and S. Rene Hypes (VDNH Project Review Coordinator).

The survey method consisted of walking through the project areas searching for different habitat types and TES species occurrences. The plant survey utilized a meander search methodology (Goff, Dawson, and Rochow, 1982) in which new habitat variations or unique areas are constantly being searched for in order to maximize floristic variation. The animal survey consisted of searching for individuals, signs of their presence (such as scat, tracks, calls, or nests), and/or potential habitat.

A listing of species noted on the field survey can be found in field notes contained in the project file. The survey found that oak species dominate the canopy layer. Other important species in the canopy layer include pine spp., maple spp., black gum and tulip poplar. Common midstory vegetation includes saplings of overstory trees, witch hazel and serviceberry. Some of the most common understory species in the forested areas include seedlings of woody species, mountain laurel, greenbrier, blueberry spp., fern spp. and mosses. The open areas contain a variety of flowers, grasses, sedges and shrubs. Many are alien or invasive species. This mixture of vegetation is typical of acidic soils developed over sandstone and shale bedrock in the Ridge and Valley portion of the Appalachian Mountains.

Also observed were many animals and animal sign commonly found in such habitats, including white-tailed deer, woodpecker spp., Arachnid spp., e. chipmunk, many species of warblers and other songbirds. The survey found only typical aquatic animals in area streams and in Todd Lake including frog spp., red-spotted newt, minnows and leeches. Attached is water chemistry and aquatic macroinvertebrate data from RBP sample sites 2030 (Little Skidmore) and 2044 (North River- Camp May Flather). The suite of aquatic macroinvertebrates sampled at RBP sample site 2044 is representative of species that would be found upstream in Skidmore Fork in the Todd Lake area.

From the field survey, species were eliminated from further consideration because of: a) a lack of suitable habitat in the project areas (OAR code “2”); b) Habitat present and the species was

searched for, but not found (OAR code "3"); c) Species occurs in project area, but outside the area the project may disturb (OAR code "4"); and d) Aquatic species or habitat known or suspected downstream of project or activity area but outside of identified geographic bounds of water resource cumulative effects analysis area (defined as point below which sediment amounts are immeasurable and insignificant) (OAR code "7"). The results of the field survey(s) are documented in the Appendix A table. For this project, 37 species were eliminated from further consideration because of one of the above reasons.

Species Identified as Being in the Action Area or Potentially Affected by the Action

From the field survey, those species which are analyzed and discussed further in this document are those that either: a) Field survey located species in the activity areas (OAR code "5"); b) Species not seen during the survey(s), but possibly occurs in the activity areas based on habitat observed during the survey(s) or field survey was not conducted when species is recognizable (OAR code "6"); c) Aquatic species, known or suspected downstream of project or activity area and within identified geographic bounds of water resource cumulative effects analysis area (OAR code "8"); or d) Federally listed mussel and/or fish species known in 6th level watershed of project area. Conservation measures from USFWS/FS Conservation Plan applied (OAR Code "9").

As a result of this process, the following species are known to occur or are potentially affected by the Proposed Action:

OAR Code	Scientific Name	Common Name	Taxa	TES
6	*Myotis sodalis*	Indiana Bat	Mammal	Endangered

Input from VDNH was sought during public scoping of the proposed project. The VDNH response, letter dated May 26, 2011, states that a search of its Biotics Data System, "documents the presence of natural resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources."

No other TES species were found, nor habitat that would likely support TES species other than the Indiana bat during the field survey. Likewise, public scoping did not identify any other TES species known to occur on the project area that would be affected. Therefore, it is unlikely that any other TES species routinely occurs in the project area. Also, the absence of likely habitat, except as noted for the Indiana bat, is the basis by which other TES species were eliminated from further consideration.

Effects of Proposed Management Action on Each Identified Species

The analysis of possible effects to species identified as known or expected to occur in the vicinity of the proposed project, or likely to be affected by the action includes the following existing information:

1. Data on species/habitat relationships.
2. Species range distribution.
3. Occurrences developed from past field surveys or field observations.
4. The amount, condition, and distribution of suitable habitat.

Effects to the Indiana Bat (Direct, Indirect and Cumulative)

Effects to the federally endangered Indiana bat (*Myotis sodalis*) were considered in this BE/BA because it is assumed the entire Forest is potential habitat for this species. See U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) of September 16, 1997 and GWJNF Environmental Assessment/Decision Notice of March 12, 1998 for the "Proposed Forest Plan Amendment for Management of the Federally Endangered Indiana Bat", herein referred to as the Bat Amendment EA (GW Amendment #6).

The project area contains habitat required by bats in general. The dam, spillway and borrow area offer open areas for bats to forage. Also, the surrounding mature forest offers potential roost sites in the form of mature trees with exfoliating bark. Bat boxes and the eaves of structures in the nearby campground provide additional roosting areas. Despite the existence of potential bat habitat, during past and recent surveys, no Indiana bats have been seen in the project area.

Based upon professional judgment and known cave surveys, there are no caves with winter microclimate habitat conditions suitable for Indiana bats in the project area and the area is not within either the primary or secondary cave protection areas surrounding known hibernacula. The nearest cave with Indiana bat use documented is approximately 18 miles northwest of the project area.

This project-level analysis has tiered to the George Washington National Forest's Revised Forest Plan and Final Environmental Impact Statement (FEIS) as amended by the Bat Amendment EA. This project-level analysis includes, and is in addition to, the entire Indiana bat effects analysis (pages 15 through 44) documented in the Bat Amendment EA. Because of its length, the Bat Amendment EA's discussion is not repeated here. However, findings of that analysis concluded that individual bats might be killed or harmed by such activities as associated with this project. Yet the USFWS determined that such take, within authorized levels, would be incidental take, and would not result in jeopardy to the Indiana bat.

There is potential unoccupied habitat for the Indiana bat within the project area, but with implementation of measures described in the BO under the Terms and Conditions section of the Incidental Take Statement, there will be no cumulative effects regardless of alternative selected.

The USFWS supported the determination for the Indiana bat in their Biological Opinion dated September 16, 1997. The BO concludes that, "After reviewing the current status of the Indiana bat, the environmental baseline for the action area, the effects of forest management and other activities on the GWJNFs, the Indiana Bat Recovery Strategy presented in the GWJNFs' biological assessment, and the cumulative effects, it is the Service's biological opinion that forest management and other activities authorized, funded, or carried out on the GWJNFs, are not

likely to jeopardize the continued existence of the Indiana bat. Critical habitat for this species has been designated in Kentucky, Tennessee, Illinois, Missouri, and West Virginia. However, this action does not affect those areas and no destruction or adverse modification of that critical habitat will occur as a result of GWJNFs management activities". There are no reasonably foreseeable future activities in the area that would affect the Indiana bat. Therefore, there will be no cumulative effects to the Indiana bat regardless of alternative selected.

Determination of Effect

For the Indiana bat, this project will be in compliance with the BO issued by the USFWS on September 16, 1997 and therefore constitutes compliance with ESA Section 7 requirements. Since implementation of this project will be in compliance with, and tiers to, the BO that was issued as a result of formal consultation and it provides both specific Plan and project level direction, plus no new information has been identified as of this date, a finding of the effect to the Indiana bat for this proposed project is: "no effect, beyond that which is already disclosed in the Biological Assessment on Indiana bats dated April 30, 1997 and by the USFWS in the BO of September 16, 1997." Therefore, given the project level effects analysis for the Indiana bat and the authorized level of incidental take, further Section 7 consultation is not necessary for the Indiana bat.

Regardless of the alternative selected, primarily because there are no other T&E species or likely habitat present, the proposed project will have no effect on any other federally listed or proposed species or their designated or proposed critical habitat.

Likewise, primarily because there are no sensitive species or likely habitat present, the project will have no impact to any Southern Region sensitive species.

Persons Consulted:

Richard D. Patton, USFS Forest Hydrologist
S. Reńe Hypes, VDNH Project Review Coordinator
Elwood Burge, USFS District Ranger

Additional Specialists Contacted:

Dave Kocka, VDGIF Wildlife Biologist
Rick Reynolds, VDGIF TES Species Program Manager
Larry Mohn, VDGIF Fisheries Biologist
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Prepared by:

/s/ *J. Terry Slater*
J. Terry Slater Date: March 16, 2012
North River Ranger District Wildlife Biologist

Attachments: References
Appendix A – Forest TES Species List
Aerial Photo and Map

VDNH Letter Dated 5/26/11
RBP Data, Sample Sites 2030 & 2044

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APPENDIX A

Documentation of Threatened, Endangered or Sensitive Species Occurrences for Todd Lake Dam Rehabilitation

Coding for Occurrence Analysis Results (OAR) for 190 species

Forest updated April 1, 2011 (based on Region 8 sensitive species list effective January 1, 2002)

OAR	GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	TES	GRank	VA SRank	WV SRank
VERTEBRATES										
Fish										
1		X	Ammocrypta clara	Western sand darter	Clinch R, Powell R	Aquatic-rivers	S	G3	S1	-
1		X	Cottus baileyi	Black sculpin	Little R, Upper Clinch R, S Fork Holston R	Aquatic-streams	S	G4Q	S2	-
1		X	Erimonax monachus	Spotfin chub	Lower N Fk Holston R	Aquatic-streams	T	G2	S1	-
1		X	Erimystax cahni	Slender chub	Two sites - Powell R, Lee Co	Aquatic-rivers	T	G1	S1	-
1		X	Etheostoma acuticeps	Sharphead darter	S and Middle Fk Holston R	Aquatic-rivers	S	G3	S1	-
1		X	Etheostoma susanae	Cumberland Johnny darter	Endemic to Upper Cumberland R watershed near VA	Aquatic-streams	PE	G2	S1 (KY)	-
1		X	Etheostoma osburni	Candy darter	Big Stony Ck, Laurel Fork in New R watershed	Aquatic-streams	S	G3	S1	S2
1		X	Etheostoma percnurum	Duskytail darter	Copper Ck, Clinch R	Aquatic-rivers	E	G1	S1	-
1		X	Etheostoma tippecanoe	Tippecanoe darter	Four sites Clinch R, lower Copper Ck	Aquatic-rivers	S	G2	S1	S2
1		X	Icthyomyzon greeleyi	Mountain brook lamprey	M, N Fk Holston R, Copper Ck, Indian Ck, Clinch R, Powell R	Aquatic-rivers	S	G3G4	S2	S1
1		X	Notropis ariommus	Popeye shiner	N Fk Holston R, Clinch R, Powell R	Aquatic-rivers	S	G3	S2S3	S2
1	X	X	Notropis semperasper	Roughhead shiner	Upper James R watershed above Buchanan	Aquatic-rivers	S	G2G3	S2S3	-
1		X	Noturus flavipinnis	Yellowfin madtom	Lower & Mid reaches of Copper Ck, Powell R	Aquatic-streams	T	G1	S1	-
1	X	X	Noturus gilberti	Orangefin madtom	S Fk Roanoke R watershed, Roanoke R above Salem, Craig Ck, Johns Ck, Cowpasture R	Aquatic-streams	S	G2	S2	-
1		X	Percina burtoni	Blotchside logperch	N Fk Holston R, Clinch R, Copper Ck, Little R	Aquatic-rivers	S	G2G3	S1	-
1		X	Percina macrocephala	Longhead darter	N Fk Holston R above Saltville, lower Copper Ck	Aquatic-rivers	S	G3	S1S2	S2
1		X	Percina rex	Roanoke logperch	Upper Roanoke R watershed	Aquatic-rivers	E	G1G2	S1S2	-
1		X	Phenacobius crassilabrum	Fatlips minnow	Unimpounded lower S Fk Holston R, Whitetop Laurel Ck	Aquatic-rivers	S	G3G4	S2	-
1		X	Phenacobius teretulus	Kanawha minnow	Upper New R watershed	Aquatic-streams	S	G3G4	S2S3	S1
1		X	Phoxinus cumberlandensis	Blackside dace	Upper Cumberland R, Upper Powell R, Poor Fk Cumberland R	Aquatic-streams	T	G2	S1	S3 (KY)
1		X	Phoxinus tennesseensis	Tennessee dace	Lick Ck, N Fk Holston R, Beaverdam Ck, M Fk Holston R	Aquatic-streams	S	G3	S1	-
Amphibian										
1		X	Plethodon hubrichti	Peaks of Otter salamander	Peaks of Otter, Apple Orchard Mtn	Mixed oak, late successional with loose rocks and logs, >1800'	S	G2	S2	-
1	X		Plethodon punctatus	Cow Knob salamander	Shenandoah Mtn, VA & WV	Mixed oak, late successional with loose rocks and logs, >2500'	S	G3	S2	S1

OAR	GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	TES	GRank	VA SRank	WV SRank
1			Plethodon shenandoah	Shenandoah salamander	Three isolated populations in SNP: Hawksbill Mtn, The Pinnacles, Stony Man Mtn. GW occurrence questionable.	Talus slopes. Erroneous records from Three Ridges, The Priest, Pompeii on the Pedlar.	E	G1	S1	-
1		X	Plethodon welleri	Weller's salamander	Mt Rogers & Whitetop Mtn	Spruce-fir forests and adjacent northern hardwoods	S	G3	S2	-
Birds										
2	X	X	Falco peregrinus	Peregrine Falcon	Hack sites late 80s & early 90s – Mt Rogers, Grayson; Cole Mtn, Amherst; Big Schloss, Shenandoah; Elliot Knob, Augusta; High Knob, Rockingham Cos. No nests, current migrant.	Nests on ledges or cliffs, buildings, bridges, quarry walls. Non-breeding sites, farmland, open country, lakeshores, broad river valleys, airports, cities. Prefers pigeons, ducks.	S	G4	S1B/S2N	S1B/S2N
3	X		Haliaeetus leucocephalus	Bald Eagle	Potomac R, James R, New R, Upper Tennessee watersheds	Feeds and nests on or near large lakes and rivers	S	G5	S2S3B/S3N	S2B/S3N
2	X		Lanius ludovicianus migrans	Migrant Loggerhead Shrike	Ridge & Valley (Shenandoah Valley)	Open grasslands with trees and shrubs, fencerows	S	G4	S2B/S3N	S1B/S2N
1	X	X	Thryomanes bewickii altus	Appalachian Bewick's Wren	Historical records in Botetourt, Giles, Highland Washington Cos	Thickets, old fields, fencerows, old home sites	S	G5T2Q	SHB/S1N	S1B/S1N
Mammals										
2	X	X	Corynorhinus townsendii virginianus	Virginia big-eared bat	Summer: VA - Tazewell Co. (3 caves), Highland Co. (1 cave), WV - Pendleton Co. (4 caves); Winter: Highland, Rockingham, Bland, & Tazewell Cos. (6 caves), Pendleton Co. (6 caves), largest VA population in Tazewell Co. & largest WV population in Pendleton Co. Small #'s of bats (usually <10) in a few other widely scattered caves during summer months. Bath & Pulaski County records are historic. No occupied caves currently known on Forest.	Resides in caves winter and summer. Short distance migrant (<40 miles) between winter and summer caves. Forages primarily on moths and foraging habitat is common (fields, forests, meadows, etc.). Forages within 6 miles of summer caves. USFWS Critical Habitat is 5 caves in WV (4 Pendleton Co. & 1 Tucker Co.). Closest Critical Habitat cave to GWJNF is ~3 miles in Pendleton Co., WV. OAR code of "2" used when project further than 6 miles from summer or winter occupied cave.	E	G4T2	S1	S2
1		X	Glaucomys sabrinus coloratus	Carolina northern flying squirrel	Mt Rogers & Whitetop area	Spruce-fir forests and adjacent northern hardwoods	E	G5T1	S1	-
1	X		Glaucomys sabrinus fuscus	Virginia northern flying squirrel	Laurel Fork area, Highland Co	Spruce forests and adjacent northern hardwoods	E	G5T2	S1	S2
1	X		Microtus chrotorrhinus carolinensis	Southern rock vole	Alleghany Mtn, Bath Co	Cool, moist, mossy talus under oaks/northern hardwoods	S	G4T3	S1	S2
1		X	Myotis grisescens	Gray bat	Ridge & Valley, Clinch R watershed	Caves winter and summer, forages widely	E	G3	S1	-
2	X	X	Myotis leibii	Eastern small-footed bat	Ridge & Valley	Hibernates in caves during winter, roosts in crevices of large rock outcrops, cliffs, & under large rocks in talus & boulder-fields during summer, plus similar man-made structures like rip-rap and bridges, forages widely in all forested and open habitat types over both ridges and valleys.	S	G3	S2	S1
6	X	X	Myotis sodalis	Indiana bat	Blue Ridge, Ridge & Valley, Cumberland Mtns	Caves winter, upland hardwoods summer, forages widely along riparian areas and open woodlands	E	G2	S1	S1
1	X		Sorex palustris punctulatus	Southern water shrew	Alleghany Mtn, Bath Co; & Laurel Fork, Highland Co	Riparian areas w/in spruce-fir forests and northern hardwoods	S	G5T3	S1S2	S1
INVERTEBRATES										
Snail (Mollusk, Class Gastropoda)										
1	X	X	Glyphyalinia raderi	Maryland glyph	Alleghany, Montgomery Cos	Calciphile, edge of seeps within leaf litter	S	G2	S1S2	S2
1	X		Helicodiscus diadema	Shaggy coil	Alleghany Co	Calciphile, limestone rubble and talus	S	G1	S1	-
1	X		Helicodiscus lirellus	Rubble coil	Rockbridge Co	Calciphile, limestone rubble and talus	S	G1	S1	-
1	X	X	Helicodiscus triodus	Talus coil	Alleghany, Botetourt, Rockbridge Cos	Calciphile, limestone rubble on wooded hillsides and near cave entrances	S	G2	S1S2	SH
1		X	Io fluvialis	Spiny riversnail	Clinch R, N Fk Holston R	Aquatic-rivers	S	G2	S2	-
1		X	Paravitrea reesi	Round supercoil	Monroe, Summers Cos, WV	Calcareous woodlands and glades	S	G3	S2	S1
Clam and Mussel (Mollusk, Class Bivalvia)										

OAR	GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	TES	GRank	VA SRank	WV SRank
7	X		Alasmidonta varicosa	Brook floater	Potomac drainage	Aquatic-rivers	S	G3	S1	S1
1		X	Cumberlandia monodonta	Spectacle case	2 sites Clinch R	Aquatic-rivers	E	G3	S1	-
1		X	Cyprogenia stegaria	Fanshell	Lower Clinch R, Scott Co	Aquatic-rivers	E	G1Q	S1	S1
1		X	Dromus dromas	Dromedary pearlymussel	Clinch R, Powell R, N Fk Holston R	Aquatic-rivers	E	G1	S1	-
1	X	X	Elliptio lanceolata	Yellow lance	Roanoke R, James R	Aquatic-rivers	S	G2G3	S2S3	-
1		X	Epioblasma brevidens	Cumberlandian combshell	Clinch R, Powell R, N Fk Holston R	Aquatic-rivers	E	G1	S1	-
1		X	Epioblasma capsaeformis	Oyster mussel	Clinch R, Powell R, N Fk Holston R	Aquatic-rivers	E	G1	S1	-
1		X	Epioblasma florentina walkeri	Tan riffleshell	Clinch R, M Fk Holston R, N Fk Holston R	Aquatic-rivers	E	G1T1Q	S1	-
1		X	Epioblasma torulosa gubernaculum	Green-blossom pearlymussel	Clinch R, N Fk Holston R	Aquatic-rivers	E	G2TX	SX	-
1		X	Epioblasma triquetra	Snuffbox	Clinch R, Powell R, N Fk Holston R	Aquatic-rivers	PE	G3	S1	S2
1		X	Fusconaia barnesiana	Tennessee pigtoe	Clinch R, Powell R, N Middle, S Fk Holston R	Aquatic-rivers	S	G2G3	S2	-
1		X	Fusconaia cor	Shiny pigtoe	Clinch R, Powell R, N Fk Holston R, Copper Ck	Aquatic-rivers	E	G1	S1	-
1		X	Fusconaia cuneolus	Fine-rayed pigtoe	Clinch R, Powell R, Copper Ck, Little R	Aquatic-rivers	E	G1	S1	-
1		X	Fusconaia masoni	Atlantic pigtoe	Roanoke R, Craig Ck drainage	Aquatic-rivers	S	G2	S2	-
1		X	Hemistena lata	Cracking pearlymussel	Clinch R, Powell R	Aquatic-rivers	E	G1	S1	-
1		X	Lampsilis abrupta	Pink mucket	Clinch R	Aquatic-rivers	E	G2	SX	S1
1		X	Lasmigona holstonia	Tennessee heelsplitter	Upper Clinch, N and M Fk Holston R drainages; Wolf Ck, Bland Co below Burkes Garden	Aquatic-streams	S	G3	S1	-
7	X		Lasmigona subviridis	Green floater	Widely distributed in N & S Fk Shenandoah R, Pedlar R, James R	Aquatic-rivers	S	G3	S2	S2
1		X	Lemiox rimosus	Birdwing pearlymussel	Clinch R, Powell R, Copper Ck, Little R	Aquatic-rivers	E	G1	S1	-
1		X	Lexingtonia dolabelloides	Slabside pearlymussel	Clinch R, M Fk Holston, N Fk Holston R	Aquatic-rivers	S	G2	S2	-
1		X	Pegias fabula	Little-winged pearlymussel	Clinch R, N Fk Holston R, S Fk Holston R, Little R	Aquatic-streams	E	G1	S1	-
1		X	Plethobasus cyphyus	Sheepnose	Clinch R, Powell R	Aquatic-rivers	E	G3	S1	S1
1	X	X	Pleurobema collina	James spinymussel	Potts Ck, Craig Ck, Johns Ck, Patterson Run, Pedlar R, Cowpasture R, Mill Ck (Deerfield)	Aquatic-rivers	E	G1	S1	S1
1		X	Pleurobema cordatum	Ohio pigtoe	Clinch R	Aquatic-rivers	S	G4	S1	S2
1		X	Pleurobema oviforme	Tennessee clubshell	Clinch R, Powell R, N, Middle, S Fk Holston R	Aquatic-streams	S	G2G3	S2S3	-
1		X	Pleurobema plenum	Rough pigtoe	Clinch R	Aquatic-rivers	E	G1	SH	-
1		X	Pleurobema rubrum	Pyramid pigtoe	Upper Clinch R	Aquatic-rivers	S	G2G3	SH	-
1		X	Quadrula cylindrica strigillata	Rough rabbits foot	Clinch R, Powell R, N Fk Holston R, Copper Ck	Aquatic-streams	E	G3G4T2	S2	-
1		X	Quadrula intermedia	Cumberland monkeyface	Powell R	Aquatic-rivers	E	G1	S1	-
1		X	Quadrula sparsa	Appalachian monkeyface	Clinch R, Powell R	Aquatic-rivers	E	G1	S1	-
1		X	Toxolasma lividus	Purple lilliput	N Fk Holston R, Clinch R	Aquatic-rivers	S	G2	SH	-
1		X	Villosa perpurpurea	Purple bean	Clinch R, Copper Ck	Aquatic-rivers	E	G1	S1	-
1		X	Villosa trabalis	Cumberland bean	Clinch R	Aquatic-rivers	E	G1	SX	-
Spider (Arachnid)										
1		X	Microhexura montivaga	Spruce-fir moss spider	Mt Rogers	Damp, well-drained moss and liverwort mats on boulders in mature spruce-fir forests	E	G1	S1	-
Pseudoscorpion (Arachnid, Order Pseudoscoriones)										
1		X	Kleptochthonius orpheus	Orpheus cave pseudoscorpion	Patton cave, Monroe Co, WV	Caves	S	G1	-	S1
Amphipod (Crustacean, Order Amphipoda)										
1		X	Stygobromus abditus	James cave amphipod	James & Sam Bells caves, Pulaski Co; Watsons cave, Wythe Co; & other New River caves	Caves	S	G2G3	S2	-
1		X	Stygobromus cumberlandus	Cumberland cave amphipod	Lee, Scott, Wise Cos	Caves	S	G3G4	S1S2	-
1		X	Stygobromus estesi	Craig County cave amphipod	Caves in Upper Sinking Ck Valley and Potts Ck, Poverty Hollow seeps, Captain seeps	Caves, seeps	S	G4	S3	-

OAR	GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	TES	GRank	VA SRank	WV SRank
1		X	Stygobromus fergusoni	Montgomery County cave amphipod	Botetourt, Montgomery Cos	Caves	S	G2G3	S1	-
1	X		Stygobromus gracilipes	Shenandoah Valley cave amphipod	Frederick, Rockingham, Shenandoah, Warren Cos	Caves	S	G3G4	S2S3	S1
1	X		Stygobromus hoffmani	Alleghany County cave amphipod	Lowmoore cave, Alleghany Co	Caves	S	G1	S1	-
1	X		Stygobromus mundus	Bath County cave amphipod	Alleghany, Bath Cos	Caves	S	G2G3	S1S2	-
Isopod (Crustacean, Order Isopoda)										
1		X	Caecidotea incurva	Incurved cave isopod	Smyth, Wythe Cos	Caves	S	G2G4	S2	-
1	X	X	Miktoniscus racovitzai	Racovitza's terrestrial cave isopod	Alleghany, Botetourt, Page, Rockbridge, Shenandoah Cos	Caves	S	G3G4	S2	-
Millipede (Class Diplopoda)										
1		X	Brachoria dentata	A millipede	Known only from Pennington Gap and Cave Spring Recreation Area, Lee Co	Leaf litter, deciduous forests	S	G1	S1	-
1		X	Brachoria eutypa ethotela	Hungry Mother millipede	Pine Mtn above Troutdale	Leaf litter, deciduous forests	S	G2	S2	-
1		X	Buotus carolinus	A millipede	Brush Mtn, Whitetop Mtn, Apple Orchard Mtn, Tazewell Beartown	Beech leaf litter, deciduous forests	S	G3	S3	-
1		X	Cleidogona hoffmani	Hoffman's cleidogonid millipede	Mt Rogers, Whitetop Mtn, Elk Garden; Hamilton cave (private) Bland Co	Mountaintop species, leaf litter, deciduous forests	S	G3	S2S3	-
1		X	Cleidogona lachesis	A millipede	Whitetop Mtn & Mt Rogers	Beech leaf litter, deciduous forests	S	G2	S1	-
1		X	Dixioria fowleri	Fowler's millipede	Walker Mtn; Comers Rock on Iron Mtn; Laurel Ck, Damascas; 1/2 mile west of NRA office; Tazewell Beartown	Leaf litter, deciduous forests	S	G2	S2	-
1		X	Dixioria pela coronata	A millipede	Endemic to Mt Rogers	Leaf litter, northern hardwood and spruce-fir forests. Altitudinally restricted, >5000'.	S	G2T2	S2	-
1	X		Nannaria shenandoah	Shenandoah Mountain xystodesmid millipede	One site: along Long Run Road, Rockingham Co	Leaf litter, mixed oak forest	S	G1	S1	-
1	X		Pseudotremia alecto	A millipede	Griffith Knob, Alleghany Co; near Mountain Grove saltpetre cave, Bath Co	Leaf litter, deciduous forests	S	G1	S1	-
1	X	X	Semionellus placidus	A millipede	Hawksbill Mtn, Apple Orchard Mtn, Tomahawk Mtn	Leaf litter, deciduous forests	S	G3	S2	-
Centipede (Insect, Order Chilopoda)										
1	X	X	Escaryus cryptorobius	Montane centipede	The Priest, Nelson Co; Whitetop Mtn, Washington Co	Upper soil horizon, spruce - birch forests	S	G2	S2	-
1		X	Escaryus orestes	Whitetop Mountain centipede	Whitetop Mtn, Washington Co	Dark moist soil and litter, spruce - birch forests	S	G1G2	S1S2	-
1	X		Nampabius turbator	A cave centipede	One known site: Lowmoore cave, Alleghany Co	Caves	S	G1G2	S1	-
Springtail (Insect, Order Collembola)										
2	X	X	Pygmarrhopalites carolynae	A cave springtail	Augusta, Highland, Bath, Lee, Wise Cos	Caves	S	G2G3	S1	-
1		X	Pygmarrhopalites commorus	A cave springtail	Giles, Lee, Wise Cos	Caves	S	G2G4	S1	-
1	X		Pygmarrhopalites sacer	A cave springtail	Bath Co	Caves	S	G1G2	S1	-
Mayfly (Insect, Order Ephemeroptera)										
1		X	Leptophlebia johnsoni	Johnson's pronggill mayfly	One location: Lewis Fk north slope Mt Rogers	Aquatic-streams	S	G4	S1	-
Dragonfly and Damselfly (Insect, Order Odonata)										
1	X	X	Gomphus viridifrons	Green-faced clubtail	New R, Craig Ck, Pound R, Locust Spring	Aquatic-rivers	S	G3G4	S2	S2
1		X	Ophiogomphus incurvatus alleghaniensis	Allegheny snaketail	Rich Ck, Giles Co	Aquatic-streams	S	G2G3T2T3	S1	S1
Stonefly (Insect, Order Plecoptera)										
1		X	Acroneuria kosztarabi	Virginia stonefly	Station Spring Ck, Tazewell Co	Aquatic-streams	S	G1	S1	-
1		X	Isoperla major	Big stripetail stonefly	Burkes Garden, Tazewell Co	Aquatic-streams	S	G1	S1	-
1		X	Megaleuctra williamsae	Smokies needlefly	Mt Rogers & Whitetop Mtn	Aquatic-streams	S	G2	S1S2	-

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1		X	Taeniopteryx nelsoni	Cryptic willowfly	Lewis Fk & Grindstone Branch N of Mt Rogers	Aquatic-streams	S	G1	S1	-
Beetle (Insect, Order Cloeoptera)										
1	X	X	Cicindela ancocisconensis	Appalachian tiger beetle	Alleghany, Bath, Highland, Lee, Rockbridge, Washington, Wise Cos	Riparian – sandy/silty edges of streams and rivers	S	G3	S2	S3
3	X	X	Cicindela patruela	Northern barrens tiger beetle	Blue Ridge, Ridge & Valley	Eroded slopes of exposed sandstone and conglomerate	S	G3	S2	S2S3
1		X	Cyclotrachelus incisus	A ground beetle	Breaks Interstate Park, Dickenson Co	Dry, well drained site, red maple, magnolia, mountain laurel	S	G4	S1	-
1	X	X	Hydraena maureenae	Maureen's hydraenan minute moss beetle	Alleghany, Bath, Botetourt, Bland, Craig, Cos	Interstitial water in riparian-shale substrate along stream edge	S	G2?	S2?	-
Scorpionfly (Insect, Order Mecoptera)										
1		X	Brachypanorpa jeffersoni	Jefferson's short-nosed scorpionfly	Sugar Run Mountain, Giles Co; Whitetop Mtn, Smyth Co	Moist soil around seeps. Only known from high elevation. Larvae use short burrows in loose soil and moss.	S	G2	S1S2	-
Butterfly and Moth (Insect, Order Lepidoptera)										
1	X	X	Callophrys irus	Frosted elfin	Frederick, Montgomery, Page, Roanoke Cos	Dry, open woods, clearings, and road/powerline ROWs w/ abundant wild indigo (*Baptisia tinctoria*)	S	G3	S2?	S1
2	X	X	Erynnis persius persius	Persius duskywing	Blue Ridge, Ridge & Valley	Bogs, wet meadows, open seepages in boreal forests	S	G5T1T3	S1	-
3	X		Pyrgus centaureae wyandot	Appalachian grizzled skipper	Ridge & Valley	Shale barrens, open shaley oak woodlands	S	G5T1T2	S1	S1
3	X	X	Speyeria diana	Diana fritillary	Blue Ridge, Ridge & Valley	Grasslands-shrublands, near streams with thistles and milkweeds, larval host plant, violets	S	G3G4	S3	S2S3
2	X	X	Speyeria idalia	Regal fritillary	Blue Ridge, Ridge & Valley	Riparian, grasslands-shrublands	S	G3	S1	S1
1	X	X	Catocala herodias gerhardi	Herodias underwing	Bald Knob, Bath; Poverty Hollow, Montgomery Co; Sand Mtn, Wythe Co (non FS property)	Pitch pine/bear oak scrub woodlands, >3000'	S	G3T3	S2S3	SU
1	X		Euchlaena milnei	Milne's euchlaena moth	Warm Springs Mtn, Catawba Creek Slopes, Sweet Spring Hollow, Salt Pond Mtn. (Doe Creek)	Moist, forested slopes of mixed pine hardwoods. Acidic oak woods.	S	G2G4	S2	S2
1	X		Psectrotarsia hebardi	Hebard's noctuid moth	Bath Co	Rich, mesic hardwood forest. Larvae host plant is Canada horse-balm (*Collinsonia canadensis*).	S	GU	SH	-
NON-VASCULAR PLANTS										
Lichen										
1		X	Gymnoderma lineare	Rock gnome lichen	Whitop Mtn.	Spruce-fir forests	S	G2	S1	-
1	X	X	Hydrothyria venosa	Hydrothyria lichen	Augusta, Amherst, Alleghany, Bedford, Botetourt, Giles, Highland, Madison, Nelson, Rockbridge, Shenandoah, Smyth, Wythe Cos	Aquatic – in streams/springs/cascades	S	G4	S1	-
1		X	Hypotrachyna virginica	Virginia hypotrachyna lichen	Mt Rogers & Whitetop Mtn	Spruce-fir forests	S	G1G2	S1	-
Liverwort										
1		X	Bazzania nudicaulis	A liverwort	Mt Rogers & Whitetop Mtn	Bark and rock outcrops in spruce-fir forests	S	G2G3	S?	-
1		X	Frullania oakesiana	A liverwort	Mt Rogers & Whitetop Mtn	Bark in spruce-fir forests	S	G3?	S?	-
1		X	Mertzgeria fruticulosa	A liverwort	Whitetop Mtn	Bark in spruce-fir forests, >5000'	S	G2Q	S?	-
3		X	Nardia lescurii	A liverwort	Blue Ridge, Ridge & Valley	Riparian – on peaty soil over rocks, usually in shade and associated w/ water, <3000'	S	G3?	SU	-
1		X	Plagiochila austinii	A liverwort	Little Stony Ck – Cascades; Red Ck on Beartown Mtn	Rich, moist, densely forested ravines; shaded outcrops	S	G3	S?	-
1		X	Plagiochila sullivantii var sullivantii	A liverwort	Whitetop Mtn, Salt Pond Mtn	Moist shaded rock outcrops, under cliff ledges, in crevices	S	G2T2	S?	-
1		X	Sphenolobopsis pearsonii	A liverwort	Mt Rogers & Whitetop Mtn	Bark of Fraser fir, mountain ash, occasionally red spruce, >5000'	S	G2	S?	-

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Moss										
1		X	Sphagnum flavicomans	Northeastern peatmoss	Whitetop Mtn	Bogs, seeps	S	G3	SU	-
VASCULAR PLANTS										
2	X	X	Aconitum reclinatum	Trailing white monkshood	Blue Ridge, Ridge & Valley	Rich cove sites, streambanks, seepages all with high pH	S	G3	S3	S3
1	X	X	Allium oxyphilum	Nodding onion	Monroe, Summers, Mercer, Greenbrier Cos, WV	Shale barrens, sandstone glades	S	G2Q	-	S2
1	X	X	Arabis patens	Spreading rockcress	Frederick, Lee, Page, Shenandoah, Warren Cos	Shaded, calcareous cliffs, bluffs, and talus slopes	S	G3	S2	S2
2	X		Arabis serotina	Shale barren rockcress	Ridge & Valley N of New R watershed	Shale barrens and adjacent open oak woods	E	G2	S2	S2
3	X	X	Berberis canadensis	American barberry	Blue Ridge, Ridge & Valley	Calcareous open woods, bluffs, cliffs, and along fencerows	S	G3	S3S4	S1
1		X	Betula uber	Virginia round-leaf birch	One location: Cressy Ck, Smyth Co	Riparian, mixed open forest, usually disturbed sites	T	G1Q	S1	-
1		X	Botrychium jennmanii	Dixie grapefern	Scott, Wise Cos	Open woods, old fields, pastures	S	G3G4	S1	-
1	X	X	Buckleya distichophylla	Piratebush	Blue Ridge S of Roanoke R, Ridge & Valley S of James R	Open oak and hemlock woods	S	G2	S2	-
1	X	X	Cardamine clematitis	Mountain bittercress	Blue Ridge, Ridge & Valley, S of New R watershed	Riparian, spring seeps, rocky streamsides	S	G3	S1	-
1	X	X	Cardamine flagellifera	Bittercress	Blue Ridge, Ridge & Valley, S of New R watershed	Riparian, spring seeps, rocky streamsides	S	G3	SH	S2
3	X	X	Carex polymorpha	Variable sedge	Blue Ridge, Ridge & Valley, N of James R	Open acid soil, oak-heath woodlands, responds to fire	S	G3	S2	S1
1	X	X	Carex schweinitzii	Schweinitz's sedge	Bath, Montgomery, Pulaski, Washington Cos	Bogs, limestone fens, marl marshes	S	G3G4	S1	-
1		X	Chelone cuthbertii	Cuthbert turtlehead	Blue Ridge Plateau, Grayson, Carroll Cos	Bogs, wet meadows, boggy woods and thickets	S	G3	S2	-
1		X	Cimicifuga rubifolia	Appalachian bugbane	Lower Clinch R watershed	Moist, rich wooded bluffs over limestone	S	G3	S2	-
1		X	Cleistes bifaria	Small spreading pogonia	Craig, Dickenson, Scott, Wise Cos	Well drained, rather open, scrubby hillsides, oak-pine-heath woodlands, acidic soils	S	G4?	S2	S1
1		X	Clematis addisonii	Addison's leatherflower	Montgomery, Roanoke, Botetourt, Rockbridge Cos	Open glades & rich woods over limestone & dolostone	S	G2	S2	-
1	X	X	Clematis coactilis	Virginia white-haired leatherflower	Ridge & Valley, Rockbridge Co, S to Wythe Co	Shale barrens, rocky calcareous woodlands	S	G3	S3	-
1	X	X	Corallorhiza bentleyi	Bentley's coralroot	Alleghany, Bath, Giles Cos VA; Monroe, Pocahontas Cos WV	Dry, acid woods, along roadsides, well-shaded trails	S	G1G2	S1	S1
3	X	X	Delphinium exaltatum	Tall larkspur	Blue Ridge, Ridge & Valley	Dry calcareous soil in open grassy glades or thin woodlands	S	G3	S3	S2
1	X		Echinodorus tenellus	Dwarf burhead	Pines Chapel Pond, Augusta Co	Pond margins, wet depressions in sandy soil	S	G5?	S1	-
1	X	X	Echinacea laevigata	Smooth coneflower	Alleghany, Montgomery Cos	Open woodlands and glades over limestone or dolomite	E	G2G3	S2	-
3	X	X	Euphorbia purpurea	Glade spurge	Blue Ridge, Ridge & Valley	Rich, swampy woods, seeps and thickets	S	G3	S2	S2
1		X	Gentiana austromontana	Appalachian gentian	Mt Rogers, Whitetop Mtn, High Knob	High elevation forests and grassy balds. Southern Appalachian endemic	S	G3	S3	S1
1		X	Hasteola suaveolens	Sweet-scented Indian-plantain	Giles, Montgomery, Pulaski Cos	Riverbanks, wet meadows	S	G4	S2	S3
2	X		Heuchera alba	White alumroot	Shenandoah Mtn	High elevation rocky woods and bluffs	S	G2Q	S2?	S2
3	X	X	Hypericum mitchellianum	Blue Ridge St. John's-wort	Blue Ridge, Ridge & Valley	Grassy balds, forest seepages, moderate to high elevations	S	G3	S3	S1
2	X		Helenium virginicum	Virginia sneezeweed	Endemic to Augusta, Rockingham Cos	Seasonally dry meadows and sinkhole depressions	T	G3	S2	-
3	X		Helonias bullata	Swamp-pink	Augusta, Nelson Cos	Sphagnum bogs, seeps, and streamsides	T	G3	S2S3	-
2	X	X	Ilex collina	Long-stalked holly	Blue Ridge, Ridge & Valley	Bogs, seep, shrubby streamheads, >3100'	S	G3	S2	S2
1		X	Iliamna corei	Peter's Mountain-mallow	One location: Narrows, Peters Mountain, Giles Co	Rich, open woods along sandstone outcrops, soil pockets, fire maintained	E	G1Q	S1	-
1	X	X	Iliamna remota	Kankakee globe-mallow	Alleghany, Botetourt, Rockbridge, Bedford Cos	Open, disturbed riverbanks and roadsides	S	G1Q	S1	-

OAR	GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	TES	GRank	VA SRank	WV SRank
1			Isoetes virginica	Virginia quillwort	Augusta Co	Depression in granitic outcrops in the Piedmont. Does not occur on the Forest.	S	G1	S1?	-
1	X	X	Isotria medeoloides	Small whorled pogonia	In mountains of VA known only from Bedford, Craig, and Lee Cos; other VA occurrences in Piedmont & Coastal Plain	Open, mixed hardwood forests on level to gently sloping terrain with north to east aspect	T	G2	S2	S1
3	X	X	Juglans cinerea	Butternut	Blue Ridge, Ridge & Valley	Well-drained bottomland and floodplain, rich mesophytic forests mostly along toeslopes	S	G4	S3?	S3
3	X	X	Liatris helleri	Turgid Gayfeather	Blue Ridge, Ridge & Valley	Shale barrens, mountain hillside openings	S	G3	S3	S2
1		X	Lilium grayi	Gray's lily	Blue Ridge, Mt Rogers & Whitetop Mtn (occurrences north of Floyd Co questionable)	Bogs, open seeps, wet meadows, grassy balds	S	G3	S2	-
1	X		Lycopodiella margueritae	Marguerite's clubmoss	Bath Co	Seasonally moist soils, wet acidic ditches, borrow pits	S	G2	NA	-
3	X	X	Monotropsis odorata	Sweet pinesap	Blue Ridge, Ridge & Valley	Dry oak-pine-heath woodlands, soil usually sandy	S	G3	S3	S1
1		X	Packera millefolium	Piedmont ragwort	Lee, Scott Cos	Open limestone outcrops and cedar barrens	S	G2	S2	-
2	X		Paxistima canbyi	Canby's mountain lover	Ridge & Valley	Calcareous cliffs and bluffs, usually undercut by stream	S	G2	S2	S2
3	X	X	Phlox buckleyi	Sword-leaf phlox	Blue Ridge, Ridge & Valley	Open, often dry oak woodlands and rocky slopes, usually over shale in humus rich soils, often along roadsides	S	G2	S2	S2
3	X	X	Poa paludigena	Bog bluegrass	Blue Ridge, Ridge & Valley	Shrub swamps and seeps, usually under shade	S	G3	S2	S1
1	X		Potamogeton hillii	Hill's pondweed	Bath Co	Clear, cold calcareous ponds	S	G3	S1	-
2	X		Potamogeton tennesseensis	Tennessee pondweed	Ridge & Valley	Ponds, back water of streams and rivers	S	G2	S1	S2
1		X	Prenanthes roanensis	Roan Mountain rattlesnake-root	Mt Rogers & Whitetop Mtn	Grassy balds, open high elevation forests and outcrops	S	G3	S3	-
1	X	X	Pycnanthemum torrei	Torrey's mountain-mint	Bland, Bath, Giles Rockbridge, Wythe Cos	Open, dry rocky woods, roadsides, and thickets near streams, heavy clay soil over calcareous rock	S	G2	S2?	S1
1		X	Rudbeckia triloba var. pinnatiloba	Pinnate-lobed coneflower	Wise Co	Dry calcareous soil of open woods and roadsides	S	G5T3	S1	-
1		X	Saxifraga caroliniana	Carolina saxifrage	Blue Ridge, Ridge & Valley, S of New R	Moist, shaded rocks and cliffs	S	G3	S3	S1
2	X	X	Scirpus ancistrochaetus	Northeastern bulrush	Ridge & Valley	Mountain ponds, sinkhole ponds in Shenandoah Valley.	E	G3	S2	S1
3	X	X	Scutellaria saxatilis	Rock skullcap	Blue Ridge, Ridge & Valley	Rich, dry to mesic ridgetop woods, 32 counties in VA, likely G4/S4	S	G3	S3	S2
2	X	X	Sida hermaphrodita	Virginia mallow	Ridge & Valley, James R watersheds	Riverbank glades with loose rock or sandy soil	S	G3	S1	S3
1		X	Silene ovata	Mountain catchfly	Lee, Wise Cos	Rich woodlands and forests over limestone	S	G3	S1	-
1		X	Spiraea virginiana	Virginia spiraea	Blue Ridge, Ridge & Valley, S of New R	Scoured banks of streams, riverside or island shrub thickets	T	G2	S1	S1
3	X		Trillium pusillum var. moniticulum	Mountain least trillium	Great North Mtn & Shenandoah Mtn, VA & WV	Open oak woodlands in well drained soil and margins of thickets	S	G3T2	S2	S1
1		X	Tsuga caroliniana	Carolina hemlock	Blue Ridge north to James R.	Rocky ridges and slopes, usually dry and well drained	S	G3	S3	-
2	X	X	Vitis rupestris	Sand grape	Ridge & Valley	Scoured banks of rivers and streams over calcareous bedrock	S	G3	S1?	S2

LEGEND FOR TES SPECIES LIST IN OCCURRENCE ANALYSIS RESULTS:

OAR CODES:

1 = Project located out of known species range.
2 = Lack of suitable habitat for species in project area.
3 = Habitat present, species was searched for during field survey, but not found.
4 = Species occurs in project area, but outside of activity area.
5 = Field survey located species in activity area.
6 = Species not seen during field survey, but possibly occurs in activity area based on habitat observed. or Field survey not conducted when species is recognizable (time of year or time of day). Therefore assume presence and no additional surveys needed.
7 = Aquatic species or habitat known or suspected downstream of project/activity area, but outside identified geographic bounds of water resource cumulative effects analysis area (defined as point below which sediment amounts are immeasurable and insignificant).
8 = Aquatic species or habitat known or suspected downstream of project/activity area, but inside identified geographic bounds of water resource cumulative effects analysis area.
9 = Project occurs in a 6th level watershed included in the USFWS/FS T&E Mussel and Fish Conservation Plan (August 8, 2007 U.S. Fish & Wildlife Service concurrence on updated watersheds). Conservation measures from the USFWS/FS T&E Mussel and Fish Conservation Plan applied.

SPECIES: The term "species" includes any subspecies of fish, wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife, which interbreeds when mature. (Endangered Species Act of 1973, as amended through the 100th Congress)

RANGE: The geographical distribution of a species. For use here "range" is expressed as where a species is known or expected to occur on or near the George Washington and Jefferson National Forests in terms of landform (feature name, physiographic province), political boundary (county name), or watershed (river, or stream name).

HABITAT: A place where the physical and biological elements of ecosystems provide a suitable environment and the food, cover and space resources needed for plant and animal livelihood. FSM 2605-91-8, pg 10 of 13

TES CODES:

T = Federally listed as Threatened
E = Federally listed as Endangered
P = Federally Proposed as T or E
S = Southern Region (R8) Sensitive species

GLOBAL RANK: Global ranks are assigned by a consensus of the network of natural heritage programs, scientific experts, NatureServe and The Nature Conservancy to designate a rarity rank based on the range-wide status of a species or variety. This system was developed by The Nature Conservancy and is widely used by other agencies and organizations as the best available scientific and objective assessment of taxon rarity and level of threat to its existence. The ranks are assigned after considering a suite of factors including number of occurrences, numbers of individuals, and severity of threats.

G1 = Extremely rare and critical imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2 = Very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.
G4 = Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.

G5 = Very common and demonstrably secure globally, though it may be rare in parts of its range, especially at the periphery.
GH = Formally part of the world's biota with the exception that may be rediscovered.
GX = Believed extinct throughout its range with virtually no likelihood of rediscovery.
GU = Possibly rare, but status uncertain and more data needed.
G? = Unranked, or, if following a ranking, ranking uncertain (ex. G3?).
G_Q = Taxon has a questionable taxonomic assignment, such as G3Q.
G_T = Signifies the rank of a subspecies or variety. For example, a G5T1 would apply to a subspecies of a species that is demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.

STATE RANK: The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources (NHRs) are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHRs is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threats.

- **S1** - Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- **S2** - Very rare; usually between 6 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- **S3** - Rare to uncommon; usually between 21 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- **S4** - Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- **S5** - Very common; demonstrably secure under present conditions.
- **SA** - Accidental in the state.
- **S#B** - Breeding status of an organism within the state.
- **SH** - Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- **S#N** - Non-breeding status within the state. Usually applied to winter resident species.
- **SR** – Reported for Virginia, but without persuasive documentation that would provide a basis for either accepting or rejecting the report.
- **SU** - Status uncertain, often because of low search effort or cryptic nature of the element.
- **SX** - Apparently extirpated from the state.
- **SZ** - Long distance migrant, whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.
- **NA** – Not Applicable- A conservation status rank in not applicable because the species is not a suitable target for conservation activities.

These ranks should not be interpreted as legal designations.

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

May 26, 2011

Attn: Terry Slater
USDA-Forest Service
North River Ranger District
401 Oakwood Drive
Harrisonburg, VA 22801

Re: UNR10 Todd Lake Rehabilitation

Dear Mr. Slater:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Rapid Bioassessment Protocol Data Sheet
George Washington and Jefferson
National Forests

Site Id **2030** Stream Name **Little Skidmore** Quad **Stokesville**
Elev Ft Utm X **658,836** Utm Y **4,247,071** Sq Km
Lta Eco Region Sub Region Roads Mt
P Str Mt I Str Mt Gradient Sinuousity

Site Id **2044** Stream Name **North River (MayFlather)** Quad **Stokesville**
Elev Ft **1597** Utm X **660,455** Utm Y **4,247,546** Sq Km **101**
Lta **23** Eco Region **67** Sub Region **67D** Roads Mt **66,145**
P Str Mt **57,629** I Str Mt **33,735** Gradient **.94** Sinuousity **1.150**

Inv Date **05-MAY-98** Sub Sampled Collectors **Terry Slater**
Pick Name **Terry Slater** Id Name **George Annis**

Ffg	Habit	Score	Taxa Order	Family	Riffle	Cpom
CG	BU	6	DIPTERA	CHIRONOMIDAE	6	0
CG	CG	4	EPHEMEROPTERA	BAETIDAE	3	0
CG	CR	4	EPHEMEROPTERA	EPHEMERELLIDAE	10	0
SC	CG	4	EPHEMEROPTERA	HEPTAGENIIDAE	34	0
CG	GN	5	INVERTEBRATES	CAMBARIDAE	1	0
SH	CR	2	PLECOPTERA	NEMOURIDAE	3	0
PR	CR	2	PLECOPTERA	PERLODIDAE	8	0
SH	CR	1	TRICHOPTERA	LEPIDOSTOMATIDAE	4	0
SH	CG	4	TRICHOPTERA	LIMNOPHILIDAE	1	0
CF	CG	6	TRICHOPTERA	POLYCENTROPODIDAE	2	0

Metrics:
Macroinvertabrate Aggregated Indexfor Streams (MAIS): **14 – Good**

	Value	Score
Simpson's Diversity Index -	.731	1
Ept Index -	8	2
% Ephemeroptera -	65.28	2
# Ephemeroptera -	3	1
Intolerant Index -	8	1
% Haptobenthos -	90.28	2
Family Biotic Index -	3.76	2
% Scrapers -	47.00	2
% 5 Most Dominant Taxa -	86.11	1

Family Dominance:

PCT	Dominant Family Name
47.22	– EPHEMEROPTERA HEPTAGENIIDAE
13.89	– EPHEMEROPTERA EPHEMERELLIDAE
11.11	– PLECOPTERA PERLODIDAE
8.33	– DIPTERA CHIRONOMIDAE
5.56	– TRICHOPTERA LEPIDOSTOMATIDAE

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Field Survey, Todd L. Dam/Spillway Project BE

Survey Date:	Observer(s)	Area Surveyed
4/15/11	T. Slater	Entire
6/24/11	T. Slater	"

Found:

Canopy: W. pine, w. oak, bl. cherry, sc. oak, n.r.o., b/. oak, r. maple, pitch pine, bl. gum, t.m. pine, VA pine, gr. ash, pignut hickory, ch. oak, e. hemlock, t. poplar, s. maple, grape vines (all levels)

Midstory: Am dogwood, a. olive, serviceberry, saplings of canopy trees, w. hazel, e. Hemlocks, bl. locust, e. red cedar, ironwood (hophornbeam), bl. willow, bl. cherry sassafras

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Understory: seedlings of O/S & M/S species, grass spp., dandelion, w. violet, f. honeysuckle, mtn. laurel, teaberry, mtn. fetterbush, greenbrier, rubus spp., fern spp., moss spp., mullein, Indian hemp, cow wheat, m. flora rose, ~~pine warbler~~, cr. vetch, w. strawberry, garlic mustard, milkweed, catberry, pussytoes, r.l. hemlock, goldenrod, cinquefoil, yarrow, fungi, purple dead nettle, also henbit, lichens, partridgeberry, blueberry spp., clover spp., Catbrier, w. bedstraw, w. iris, May apple, colt's foot, spicebush, Aster spp., chicory, serecea lespedeza, Deptford pink, sp. knotweed, sedge spp., Queen Anne's lace, VA creeper, poison ivy, w. snakeroot, burdock, everlasting pea, wood vetch, f. sol. seal, jewelweed, bl. cohosh, lawn-lobed hawthorn, w. sumac, r. snake weed, sp. wintergreen, squawroot, mushroom spp., hawkweed, r. snake plantain,

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Animals (seen, heard, or sign): b. jay, goldfinch, Am. crow, r.s. towhee, i. bunting, bluebird, b/a gnatcatcher, chickadee, pileated w.p., gray squirrel, r. br. nuthatch, robin, b&w warbler, w.t. deer, n. flicker, e. chipmunk, broad-winged hawk, pine warbler, downy w.p., Am. woodcock, gray catbird, red swainson, king fisher, w. br. nuthatch, Arachnid sp., sc. tanager, gr. crested flycatcher, i. bunting, Cooper's hawk, m. dove, red bellied w.p., c. waxwing, r. eyed vireo, s.c. junco, whip-poor-will, ruby-thr. hummingbird, swallow sp., bluebird, s. flying squirrel, r.w. blackbird, ovenbird, chimney swift,

Insects:
- Coleoptera - metallic beetle, firefly, ladybug,
- Orthoptera - cricket, grasshopper spp., p. mantis
- Hymenoptera - bumble bee, honey bee, ant spp.
- Diptera - robber fly, house fly, gnat, mosquito,
- odonata - dragonfly
- Lepidoptera - red sp. purple, cabbage moth, silver-spotted skipper, t. swallowtail

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Aquatic Animals: chorus frog, spring peeper, r.s. newt, minnows, leech sp., w. stride

Check RBP sample sites 2030 & 2044 for aquatic macroinvertebrates.

Other Obs.:
- Honeybees and bumblebees working on p. dead nettle 4/15
- HWA on hemlocks below dam
- No sign of C. rosea on 4/15/11, 6/24/11
- Evidence of old fire scars
- Found no TES species 4/15/11, 6/24/11
- Know of no TES spp. from previous field surveys.

APPENDIX F

RECORD OF INVESTIGATION AND ANALYSIS

Appendix F. Investigation and Analysis Used in the Planning for the Rehabilitation of the Upper North River Dam Site No. 10 (Todd Lake).

Threatened and Endangered Species: As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on investigations and inventories of endangered, threatened, and sensitive (TES) species and other responsibilities per the Endangered Species Act (ESA) and completed a Biological Evaluation (BE) and Biological Assessment (BA) per U.S. Forest Service policy. The U.S. Forest Service conducted database searches, field surveys, interviewed local experts, public scoping, and reviewed known locations of species known to inhabit the George Washington and Jefferson National Forest to investigate potential impacts to any TES. Additional information on methodology used for their TES investigations can be found in the BE/BA in Appendix E.

Cultural Resources, Natural and Scenic Areas, and Visual Resources: As a Cooperating Agency of this project, the U.S. Forest Service agreed to take the lead on inventories and investigations of cultural resources and other responsibilities per Section 106 of the National Historic Preservation Act. U.S. Forest Service cultural resources staff completed database searches for any known cultural resources and ground surveyed the project area (56.3 acres) for evidence of archaeological and/or historical resources that had the potential to be impacted. Consultation with the Virginia Department of Historic Resources (VDHR) was initiated in February 2011 by the U.S. Forest Service with the submission of a cultural resources reconnaissance report pertaining to the proposed Todd Lake Dam rehabilitation project. On March 15, 2011, the VDHR indicated their concurrence with the U.S. Forest Service's finding of "*no historic properties affected"* for the proposed Todd Lake dam project.

The absence of Natural Heritage Resources, including Natural and Scenic Areas and Visual Resources, was determined by review of the Virginia Department of Conservation & Recreation Natural Heritage Resource Map for Augusta County and through a scoping letter received from the Virginia Department of Conservation & Recreation's Division of Natural Heritage.

Water Quality: Water quality data was taken from the Virginia DEQ 2010 305(b)/303(d) Integrated Water Quality Assessment and Impaired Waters Report.

Wetlands: A wetland investigation for Todd Lake was completed during June 2011. Prior to conducting fieldwork, an off-site evaluation was completed. NRCS consulted the Stokesville USGS 7.5 minute Topographical Quadrangle Map, the *National Wetlands Inventory Interactive Mapper* (NWI), administered by the U.S. Fish and Wildlife Service, and soil survey information provided by NRCS. The USGS quad map shows a moderately sloping site within the floodplain of Skidmore Fork. The NWI mapping depicts only the 5.9 acre open water wetland. Of that, 0.1 acres were identified to be fringe wetlands during the field visit. No additional wetlands were identified during the on-site investigation. Fieldwork was conducted using methods as outlined in the *1987 Corps of Engineers Wetland Delineation Manual*.

Forest and Wildlife Resources: Information on the forest and wildlife resources was obtained from field surveys and existing information from the U.S. Forest Service. Field surveys were conducted by U.S. Forest Service staff during April and June 2011.

Geology: Reference for this plan: The Geologic Map of Virginia, 1993, compiled by the Commonwealth of Virginia Department of Mines, Minerals, and Energy.

Sediment: NRCS performed the sediment survey in August 2010. Data was collected on a 50-foot grid across the entire surface of the lake. A total station was used to record the sediment depths. The quantity of sediment was determined by generating two surfaces in AutoCad Civil 3D. The upper surface was defined as the top of the sediment and the lower surface was defined as the bottom of the sediment layer corresponding to original reservoir bottom.

HYDRAULICS AND HYDROLOGY

Background: Hydrologic and hydraulic investigations consisted of an analysis of rainfall runoff relationships of the Todd Lake watershed and intervening watersheds downstream of Todd Lake.

Precipitation Data and Hydrologic Data: The 2004 NOAA-14 and NOAA Hydrometeorological Report No. 51 precipitation data was used in the evaluation.

Year	100-year, 6-hour event, inches	100-year, 24-hour event, inches	100-year, 10-day event, inches	6-hour PMP, inches	24-hour PMP, inches
2011	4.31	6.95	10.3	28	36

The Hydrologic procedures in TR-55 were used to compute the runoff parameters. HEC-HMS was used to route the 5, 10, 25, 50, 100, 200, 500, and 1,000-year, Type II, 24-hour storm discharges through the existing structures and the intervening subwatersheds' downstream floodplain. Land cover was determined from digital land use maps (USDA's National Land Cover Database 2001). Soil data was generated from digital soil data maps (USDA-NRCS' Soil Survey Geographic (SSURGO) database for Augusta County, Virginia).

SITES Analysis: The SITES model was used to evaluate the capacity, stability and integrity of the existing structure and the auxiliary spillway alternatives. Geotechnical information was taken from the Auxiliary Spillway Erodibility Study for Todd Lake (Structure #10) by Gannett Fleming, Inc., dated April 2006. The NRCS Standard rainfall distribution was used for the 6-hour PMP. This is the dimensionless storm distribution from TR-60, Figure 2-4. The 5-point distribution was used for evaluation of the 24-hour PMP event. The 6-hour storm was found to be the critical duration for the Freeboard Hydrograph (FBH).

The existing vegetated auxiliary spillway does not meet NRCS stability criteria. Both the 6-hour and 24-hour FBH storms cause the auxiliary spillway to breach.

The frequency of operation of the auxiliary spillway is statistically once in 100 years.

Water Surface Elevation Modeling: HEC-HMS was used to route the 5, 10, 25, 50, 100, 200, 500, and 1,000-year Type II, 24-hour storms through the North River Watershed including the

existing Todd Lake, Hearthstone Lake, and Elkhorn Lake. The steady flow HEC-RAS model was then used to identify water surface elevations, discharges, velocities and Froude numbers. The geometry included cross section developed from the VGIN (Virginia Geographic Information Network) 2007 Triangular Irregular Network (TIN). Supplemental culvert and bridge data was obtained from VDOT bridge drawings and incorporated into the HEC-RAS model. No consideration was given to the effect of debris blockage at bridges or other locations.

Breach Modeling: The NRCS Technical Release No. 60, Earth Dams and Reservoirs (TR60), and No. 66, Simplified Dam-Breach Routing Procedure (TR66) was used to calculate Upper North River 10 Sunny day breach inundation zone. The elevation of the reservoir at which the breach occurs was set at the existing auxiliary spillway crest of 1933.6ft, with the height of the water at 55 feet. The breach hydrograph was routed downstream using the both unsteady and steady HEC-RAS models to identify the water surface elevations within the downstream floodplain for the breach event. The HEC-RAS models utilized geometry data from the VGIN 2007 TIN. Manning's roughness coefficient "n" values of 0.045 in the channel and 0.05 to 0.1 in the overbank were used.

Within the Sunny day breach inundation zone, the population at risk is 442. This was determined by overlaying the Sunny day breach inundation zone and the Augusta County 'structure' data. The structure data includes current land ownership and description of associated improvements. The structure data includes single family dwellings, multiple family dwellings, businesses, gas stations, churches, recreational areas, and government infrastructure. Adjustments to the number of structures impacted are described in the section below. Virginia NRCS references ACER11 and state laws and regulations to estimate the number of people that are reasonably expected in the breach inundation zone. The table below describes the population at risk per structure type and the number of structures in the Sunny day breach inundation zone (after adjustments).

Identification of Impacted Structures: All of the structures in the potential breach impact zone of Todd Lake were identified using GIS information provided by Augusta County. The water surface elevations were computed for the existing and Sunny Day Breach conditions with the dam in place. The water surface elevations were also computed for the Decommission scenario. These water surface elevations were compared to the structure elevations to determine the predicted damages for the 1-year, 2-year, 5-year, 10-year, 25-year, 50-year, 100-year, 200-year, 500-year, and 1,000-year events for the existing and decommissioning scenarios and the Sunny Day breach event.

The structure elevations were estimated according to the structure type and year of construction. The ground elevation at each structure, as determined by the TIN, was used as the starting elevation. Adjustments were made as shown in the table below. According to Chapter 25. Zoning, Division H. Overlay Districts, Article XLVII. Floodplain Overlay (FPO) Districts, §25-472. Definitions, New Construction applies to "…structures for which the "start of construction" commenced on or after the effective date of an initial Flood Insurance Rate Map or after December 31, 1974, whichever is later…" After that time, the first floor of the new structure had to be one foot above the base flood elevation (100-year event) per §25-475.

Structure	Adjustment	PAR	No. of Structures in the Sunny day breach inundation zone
Business	None	4	4
Church	Ground elevation + 1’	1	2
Club	Ground elevation + 1’	1	1
Mobile Home	Ground elevation + 2’ if built before 1975 100-year existing condition Water Surface Elevation + 1’ if built in 1975 or later	2.5	33
Modular Home	Ground elevation + 3’ if built before 1975 100-year existing condition Water Surface Elevation + 1’ if built in 1975 or later	2.5	7
Recreational, Girl Scout Camp	Ground elevation + 2’	2.5	7
Recreational, other	None		
Single Family	Ground elevation + 1’ if built before 1975 100-year existing condition Water Surface Elevation + 1’ if built in 1975 or later	2.5	122
Trash Collection	None	0	1

SOCIAL AND ECONOMIC CONDITIONS

Sources for the data included in the social and economic conditions section of this supplement include the U.S. Census Bureau, Department of Commerce, 2000 Census, and 2006-2010 Census projections.

Economic Analysis: The NRCS National Watershed Manual was used as a reference for the economic analysis along with two economic analysis guidance documents: “Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies” (P&G), U.S. Water Resources Council, March, 1983, and the “Economics Handbook, Part II for Water Resources”, USDA/Natural Resources Conservation Service, July, 1998. These guidance documents were used to evaluate potential flood damages, and estimate recreational use, project benefits and associated costs. P&G was developed to define a consistent set of project formulation and evaluation instructions for all federal agencies that carry out water and related land resource implementation studies. The basic objective of P&G is to determine whether or not benefits from project actions exceed project costs. P&G also requires that the “National Economic Development” or NED alternative, which maximizes monetary net benefits, be selected for implementation unless there is an overriding reason for selecting another

alternative based on federal, state, local or international concerns related to the social and environmental accounts. The allowance for exceptions to the NED plan recognizes the fact that not all project considerations or benefits can be quantified and monetized when it comes to some ecological system and social effects.

Basic data were obtained from field surveys and government officials within the watershed, e.g., assessed values for all homes and other properties within the breach inundation zone. Detailed data on the homes and other structures within the floodplain, breach inundation zone, and breach flood pool of the Todd Lake watershed were obtained from field surveys and the USFS Recreation Manager.

Flood damages were based on the results of the hydrology and hydraulics (H&H) simulation modeling carried out by the Schnabel Engineering. The H&H data routed water for the storm events modeled establishing the extent of the floodplain as well as flood depths. This data was then used with water depth to damage functions developed by the Federal Emergency Management Agency (FEMA) to estimate damages by storm event for both the future without federal project (FWOFP) and future with federal project (FWFP) candidate plans. Estimated damages are derived from assessed property values for structural damages. Content values were estimated as a function of assessed property values.

These estimated damages formed the basis needed to construct damage frequency curves relating percent chance of storm occurrence with specific event damage estimates. The resulting functional relationships permit the prediction of damages for lesser and greater events than the storms of record and the simulated storm events. Annualized estimates of storm damages from all storm events for the FWOFP and FWFP scenarios is the end result of this analysis. Loss of recreation and property values, if applicable are added to the predicted annual damages to establish total average annual damages for both the FWOFP and FWFP alternatives.

All costs of installation, operation and maintenance were based on 2012 prices. The costs of associated with designing and implementing all structural measures were assumed to be implemented over a two-year installation period (1 year for design and 1 year for construction) and to have a 50-year useful life. Thus, a 52 year period of analysis was used along with the mandated 4.00% discount rate for all federal water resource projects for FY12 to discount and amortize the anticipated streams of costs and benefits.

There has been no computation of damage reduction benefits associated with the two alternatives because they are the same in scope, cost and effects. Therefore, there are no net benefits. The basis for the assumptions concerning FWOFP and FWFP conditions are covered in the plan under “Effects of Alternative Plans” and “Comparison of Candidate Plans.”