

FINAL
Supplemental Watershed Plan No. 6 & Environmental Assessment
for the
Rehabilitation of Floodwater Retarding Structure No. 8
of the Pohick Creek Watershed
Fairfax County, Virginia



PREPARED BY

USDA Natural Resources Conservation Service

IN COOPERATION WITH
Fairfax County Board of Supervisors
Northern Virginia Soil and Water Conservation District

September 2011

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Authority

The original work plan was prepared and the works of improvement were installed under the authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566), as amended. The rehabilitation of Pohick Creek Dam No. 8 is authorized by the Watershed Protection and Flood Prevention Act (Public Law 83-566) as amended by the Small Watershed Rehabilitation Amendments of 2000 (Section 313 of Public Law 106-472).

Abstract

Pohick Creek Dam No. 8, Huntsman Lake, does not presently meet NRCS or Virginia safety standards for the stability and integrity of the auxiliary spillway. The recommended plan will rehabilitate the Huntsman Lake dam to meet current safety and design criteria. The plan provides for realigning the auxiliary spillway and armoring it with Articulated Concrete Blocks from the control section of the auxiliary spillway to the valley floor. The training dikes will be extended to the valley floor also. Approximately 40 feet of the dam embankment will be raised by 0.6 feet. The existing open top principal spillway riser will be replaced by a baffle type riser. There will be no change in the current levels of flood protection downstream as a result of project activity.

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.

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, 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.

POHICK CREEK WATERSHED AGREEMENT

Supplemental Watershed Plan Agreement
(Supplement No. 6)

between the

Fairfax County Board of Supervisors
Northern Virginia 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”)

Whereas, the Watershed Work Plan Agreement for the Pohick Creek Watershed, Commonwealth of Virginia, authorized under the Watershed Protection and Flood Prevention Act (Public Law 83-566, 16 U.S.C. 1001 et seq.) 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 1st day of April 1969; 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 25th day of September 1970; 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 18th day of October 1971; 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 25th day of September 2006; 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 30th day of June 2008; 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 31th day of August 2009; 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 Pohick

Creek Dam No. 8 located in Fairfax County, Commonwealth of Virginia, under the authority of the Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. Sections 1001 to 1008, 1010, and 1012); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act 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 Pohick Creek Dam No. 8, 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 Pohick Creek Dam No. 8, 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 (77 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):	86.4%	\$1,829,000	13.6%	\$287,000	\$2,116,000
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%	\$248,000	\$248,000
Sponsors' Engineering Costs:	n/a	n/a	100%	\$360,000	\$360,000
Sponsors' Project Administration Costs:	n/a	n/a	100%	\$80,000	\$80,000
Land Rights Acquisition Costs:	n/a	n/a	100%	\$10,000	\$10,000
Subtotals: Cost-Sharable Costs: Cost-Share Percentages:^{a/}	(65%)	\$1,829,000	(35%)	\$985,000	\$2,814,000 (100%)
Non Cost-Sharable Items (per PL-106-472 and NRCS policy)^{b/}	---	---	---	---	---
NRCS Engineering and Project Administration Costs:	100%	\$110,000	n/a	n/a	\$110,000
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%	\$110,000	100%	\$1,000	\$111,000
Total Cost-Sharable Cost	n/a	\$1,939,000	n/a	\$986,000	\$2,925,000
Total Installation Cost^{c/}	n/a	\$1,939,000	n/a	\$738,000	\$2,677,000

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 \$100,000 and NRCS project administration costs of \$10,000;

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 \$248,000.

- 6. Land treatment agreements.** Approximately 79% of the drainage area above Pohick Dam No. 8 is urban with the remaining 21% in zoned woodland. 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 (75 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 its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a 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, plan, 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, plan, 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.

Fairfax County Board of Supervisors

12000 Government Center Parkway, Suite 552
Fairfax, Virginia 22035-2531

By: Anthony H. Griffin
ANTHONY H. GRIFFIN

Title: County Executive

Date: 9/13/11

The signing of this supplemental watershed agreement was authorized by the governing body of the Fairfax County Board of Supervisors at a meeting held on

September 13, 2011

Nancy Velus
County Clerk

12000 Government Center Parkway,
Suite 533
Fairfax, Virginia 22035-0072

Date: 9/14/11

**Northern Virginia Soil and Water
Conservation District**

12055 Government Center Parkway, Suite 905
Fairfax, Virginia 22035-5512

By: Jean R. Packard
JEAN R. PACKARD

Title: Chairperson

Date: 7/26/11

The signing of this supplemental watershed agreement was authorized by the governing body of the Northern Virginia Soil and Water Conservation District at a meeting held on

July 26, 2011

Joan Hoffman
District Administrator

12000 Government Center Parkway,
Suite 533
Fairfax, Virginia 22035-0072

Date: 7/26/11

**Natural Resources Conservation Service
United States Department of Agriculture**

Approved by:

John A. Bricker
JOHN A. BRICKER
State Conservationist

Date: Sept. 16, 2011

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SUMMARY OF SUPPLEMENTAL WATERSHED PLAN No. 6 AND ENVIRONMENTAL ASSESSMENT

for the Rehabilitation of Pohick Creek Watershed Dam No. 8 Fairfax County, Virginia 11th Congressional District

Prepared by: United States Department of Agriculture, Natural Resources Conservation Service (NRCS).

Authorization: Watershed and Flood Prevention Act (Public Law 83-566, as amended (16 U.S.C. Section 1001 et. seq.)) by the Small Watershed Rehabilitation Amendments of 2000 (Section 313 of Public Law 106-472).

Sponsors: Fairfax County Board of Supervisors
Northern Virginia Soil and Water Conservation District

Proposed Action: Rehabilitate Pohick Creek Watershed Dam No. 8, Huntsman Lake, to meet current safety and design criteria.

Purpose and Need for Action: The purpose of this action is to continue to provide flood control in a manner that minimizes the risk of loss of human life and is both cost effective and environmentally acceptable. Due to changes in evaluation criteria, Pohick Creek Dam No. 8, Huntsman Lake, does not presently meet NRCS or Virginia safety standards for the stability and integrity of the auxiliary spillway. This is a high hazard dam in an urban watershed. The open top riser of the principal spillway presents a potential safety hazard to the public.

Rehabilitation of the structure will provide continuation of flood control for an additional 75 years, minimize the risk of loss of life, and address the identified problems.

Description of Preferred Alternative: The plan provides for realigning the auxiliary spillway and armoring it with Articulated Concrete Blocks (ACBs) from the control section of the auxiliary spillway to the valley floor. The training dikes will be extended to the valley floor also. Approximately 40 feet of the dam embankment will be raised by 0.6 feet. The existing open top principal spillway riser will be replaced by a baffle type riser.

Resource Information:

Location: Latitude: 38.755 Longitude: -77.2625

8-Digit Hydrologic Unit Number: 02070010

Climate and Topography: The watershed has a continental, humid, temperate climate, and is characterized by warm to hot summers and rather cold winters. Huntsman Lake is located in the Piedmont Physiographic Province. The topography is relatively flat to gently sloping.

Watershed Size: Pohick Creek Watershed = 23,595 acres
Drainage Area of Huntsman Lake = 1,482 acres

Land Use: Residential/Business: 1,074 acres, 72.5%
Woodland: 310 acres, 20.9%
Transportation: 17 acres, 1.2%
Open Space: 51 acres, 3.4%
Water: 30 acres, 2.0%

Land Ownership: Upstream of dam: 91.4% private, 8.6% public
Downstream of dam: 18.3% private, 81.7% public

Population and Demographics: The population for Fairfax County from the 2005-2009 American Community Survey 5-Year Estimates was 1,012,751. The population diversity was 67% White, 16% Asian, 14% Hispanic (of any race), 9.2% Black or African American, and 4.8% Other. The median age of the population of Fairfax County was projected to be 37.1 as compared to 36.7 for the State and 36.5 for the entire nation. Residents 65 years of age or older totaled 9.3% of the total population. This compares to 11.8% for the State and 12.6% for the entire nation.

The 2005-2009 Census estimates indicate that there were 391,103 housing units within Fairfax County with 94.2% occupied, 72.4% owner-occupied and 27.6% renter-occupied. The state-wide occupancy rate for Virginia as a whole in the 2005-2009 Census was 90.0% and the national figure was 88.2%. The local and state-wide rates for owner-occupancy, 72.4% and 69.2%, respectively, are higher than the national figure of 66.95%. Residential property values for the land and associated buildings downstream of the dam range between \$214,000 and \$378,000 with an average of \$311,000. The total value of residential property (structures and contents only, excluding land values) at risk below the dam is an estimated \$7,816,000.

In the 2005-2009 Census, per capita personal income for Fairfax County was \$48,140. That makes the County income 52.3% higher than the State level and 78% higher than the national figure.

Cultural Resources: A Phase I archaeological survey was conducted in December 2007 of the area below the dam downstream for approximately 200 meters. The ground surface and creek bed were searched for quartz and other natural material that could be used for the manufacture of stone tools. None were found. No previously recorded archaeological sites are present within the surveyed area. No further work is recommended. The Virginia Department of Historic Resources concurred with this conclusion.

Floodplains: The entire area of the 100-year floodplain has been zoned by Fairfax County to prevent development.

Highly Erodible Cropland: None exists in the watershed.

Threatened and Endangered Species: There are no federally threatened or endangered species within two miles of the project area. There are seven (7) State Threatened (ST) and one (1) State Endangered (SE) animal species known or likely to occur within a two mile radius of the Huntsman Lake dam site. There are no confirmed sightings of these species. Four (4) of these are also Federal Species of Concern (FS). The listed species are:

T&E Species	Scientific Name	Status	Confirmed
Brook Floater	<u>Alasmodonta varicosa</u>	FSSE	No
Henslow's Sparrow	<u>Ammodramus henslowii</u>	FSST	No
Appalachian Grizzled Skipper	<u>Pyrgus wyandot</u>	FSST	No
Migrant Loggerhead Shrike	<u>Lanius ludovicianus migrans</u>	FSST	No
Bald Eagle	<u>Haliaeetus leucocephalus</u>	ST	No
Loggerhead Shrike	<u>Lanius ludovicianus</u>	ST	No
Upland Sandpiper	<u>Bartramia longicauda</u>	ST	No
Wood Turtle	<u>Glyptemys insculpta</u>	ST	No

Wetlands: There are approximately 0.4 acres of fringe wetlands and 28.6 acres of open water wetlands associated with Huntsman Lake. There are freshwater forested wetlands downstream of the lake.

Resource Concerns Identified Through Scoping: See Table S1.

Alternative Plans Considered: Five alternative plans were considered during the planning process. One alternative plan was evaluated in detail. This alternative will be used for both the No Federal Action and the Rehabilitation alternatives.

1. No Federal Action – Sponsors will use the alternative proposed by NRCS to rehabilitate the dam to meet current dam safety and design criteria without Federal assistance.
2. Rehabilitate the Dam with Articulated Concrete Blocks (ACBs) – Rehabilitate the dam to meet current dam safety and design criteria using Federal assistance.

Components of Each Alternative: The rehabilitation of the dam involves the following actions:

- Armor the control section, outlet section, and training dikes with ACBs, topsoil, and vegetation.
- Extend the existing training dikes to the valley floor to protect the dam embankment and to contain the auxiliary spillway flows.
- Change the alignment of the auxiliary spillway to move it away from residences and to protect the sanitary sewer.
- Regrade the top of the dam for approximately 40 feet adjacent to the auxiliary spillway to raise it 0.6 feet to the design elevation.
- Replace the principal spillway riser with a baffle top riser.

Table S1. Resource Concerns Identified Through Scoping.

Items/Concerns	Rationale
WATER	
Regional water resources plans (including coastal zone plans)	Consistency Certification will be needed.
Sewer utilities	Concerns about access to sewer line under dike or spillway after implementation. Minimize depth of fill over existing sewer line.
Streams, Lakes, and Wetlands	The lake will be temporarily drained during construction.
Water quality	Increased sediment during implementation and Resource Protection Area impacts.
Water resources	Provides recreation value to community.
AIR	
Air Quality	Temporary effects during construction.
PLANTS	
Forest resources	Loss of trees. Ensure there is mitigation for the trees.
Invasive species	Investigate if any currently present and ensure none are introduced during implementation.
Natural areas	No State Designated Natural Areas present.
Riparian areas	Some riparian areas downstream of the dam will be impacted.
ANIMALS	
Endangered and Threatened Species	None present.
Essential fisheries	Temporary downstream spring spawning impacts during drawdown and fish lost from draining lake during implementation.
Fish and wildlife (including coordination requirements)	Short-term impacts to fish and wildlife habitat. Fish in the lake will be lost when the lake is drained during rehabilitation.
Migratory birds	Temporary effects during construction.
HUMAN	
Costs/National Economic Development (NED) P&G	Net Economic Development must be considered.
Construction access	Concern of residential impacts, such as street parking and impacts to lake access road (maintenance road) during implementation.
Cultural resources	No adverse impacts to cultural resources.
Environmental Justice and Civil Rights	No disparate treatment is anticipated.
Parklands	Temporary interruption of use.
Public health and safety	Secure construction area during implementation (entire footprint of lake, spillway, and dam). Manage traffic on Golden Ball Tavern Court during implementation.
Public recreation	Temporary impact to trail across dam during implementation. Loss of fishing during drawdown and for 3-4 years to rebuild fish stocks.
Scenic beauty	Temporary impacts while lake is drawn down, loss of trees, and unsightly construction equipment.

Project Costs (Dollars):

Category	PL-106-472 Funds		Other Funds		Total	
	Dollars	%	Dollars	%	Dollars	%
Construction	\$1,829,000	65%	\$287,000	35%	\$2,116,000	100%
Engineering	\$100,000	100%	\$360,000	100%	\$460,000	100%
Relocation	n/a	n/a	n/a	n/a	n/a	n/a
Real Property Rights	n/a	n/a	\$10,000	100%	\$10,000	100%
Project Administration	\$10,000	100%	\$80,000	100%	\$90,000	100%
Other (permits)	\$0	0%	\$1,000	100%	\$1,000	100%
TOTAL COSTS	\$1,939,000		\$738,000		\$2,677,000	
Annual O&M (non-Federal)	n/a	n/a	\$2,500	100%	\$2,500	100%

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 Huntsman Lake are identical in scope, substantially equivalent costs and equal effects.

Number of Direct Beneficiaries: Onsite - 550, Offsite – 13,800

Other beneficial effects:

- Minimizes the threat to loss of life to approximately 36 people that live in the 13 single family homes within the breach inundation zone.
- Provides protection for more than 10,600 vehicles on a daily basis that utilize Thornecliff Lane (2,200 vehicles), Hooes Road (No data), and Gambrell Road (8,400 vehicles).
- Provides protection for four utilities (sewer, water, electricity, and gas).
- Minimizes the threat of loss of access and loss of emergency services for 94 residences 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 75 years.
- Eliminates the liability associated with continuing to operate an unsafe dam.
- Traps 1.5 acre feet of sediment annually, thereby improving downstream water quality.
- Maintains existing stream habitat downstream of the dam.
- Retains the existing fish and wildlife habitat 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: \$75,000 in year one for engineering and project administration and \$35,000 in year two for construction supervision and project administration; \$1,829,000 in year two for construction;

Non-Federal funds: \$330,000 for engineering, \$10,000 for land-rights related costs and \$1,000 for permitting costs in year one and \$110,000 in year two for engineering and project administration; \$287,000 in year two for construction;

Period of Analysis: 77 years (includes 1 year for design and 1 year for construction)

Project Life: 75 years

Environmental Effects/Impacts:

<u>Resource</u>	<u>Impact</u>
Air Quality	Short term impacts during construction.
Land Use Changes	Remove 1.4 acres of trees and replace with grass.
Floodplains	Current floodplain would be maintained.
Fisheries	Lake fisheries would be lost due to lake draw down and return 3-4 years after project completion.
Wildlife Habitat	Approximately 1.4 acres of upland forest habitat will be lost due to the construction of the new auxiliary spillway. This habitat will be mitigated for within the watershed.
Wetlands	Temporary effects during construction.
Prime Farmland	N/A
Cultural Resources	No effect.
Threatened and Endangered Species	No effect.
Mitigation	Replant 2.5 acres of trees within the watershed to mitigate for 1.4 acres of tree removal and 1.1 acres of disturbed grass.

Major Conclusions: In order to bring this dam into compliance with State safety criteria, it is necessary to rehabilitate the auxiliary spillway and training dike. The majority of the environmental impacts are short-term 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 Pohick Creek Dam No. 8, known locally as Huntsman Lake. This dam was built in 1973. Due to changes in evaluation criteria, 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 and stability. A conditional certificate for Operation and Maintenance of the structure has been 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. For this reason, the dam does not meet the objectives of the Fairfax County Board of Supervisors and the Northern Virginia Soil and Water Conservation District (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 Huntsman Lake Watershed.

The recommended plan is to rehabilitate the Huntsman Lake dam to meet current safety and design criteria. The plan provides for realigning the auxiliary spillway and armoring it with Articulated Concrete Blocks from the control section of the auxiliary spillway to the valley floor. The training dikes will be extended to the valley floor also. Approximately 40 feet of the dam embankment will be raised by 0.6 feet. The existing open top principal spillway riser will be replaced by a closed top baffle type riser. 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 purpose of this action is to continue to provide 100-year flood control in a manner that minimizes risk of loss of human life and is both cost effective and environmentally acceptable. Pohick Creek Dam No. 8, Huntsman Lake, does not presently meet NRCS or Virginia Division of Dam Safety standards for the stability and integrity of the auxiliary spillway. In addition, the riser of the principal spillway does not meet current NRCS safety and performance standards. This is a high hazard dam in an urban watershed. Rehabilitation of the structure is needed to provide continuation of flood control for an additional 75 years, minimize the risk of loss of life, and address identified problems.

At the present time, the dam at Huntsman Lake protects the bridges across Middle Run that are used by more than 10,600 vehicles per day. It also protects the overhead electric and telephone lines and the underground sewer lines that cross the floodplain. In the 1970's, before any of the Pohick Creek dams were built, Fairfax County zoned the 100-year floodplain to prevent development. Therefore, there are no structures within the 100-year floodplain other than the bridges and utilities. With the dam in place, damages to homes within the floodplain would not begin to occur until the 500-year event. Although the overhead utilities could be inundated in the 100-year event, the velocities are 5 feet per second or less, and little damage is anticipated.

ORIGINAL PROJECT

A plan for flood prevention and watershed protection was authorized in 1969 under the authority of Public Law 83-566, the Watershed Protection and Flood Prevention Act of 1954. The original work plan included the construction of seven single-purpose dams and one multi-purpose dam that were all high hazard dams designed for a 100-year life, an accelerated land treatment program for watershed protection, and 6.28 miles of stream channel improvement. Of the structures proposed in the plan, five of the single purpose dams and one multi-purpose dam were built from 1970 to 1985. Planned sites No. 6 and No. 10 and the channel work were deleted from the planned works of improvement. The project was completed in January 1994.

WATERSHED PROBLEMS

The Virginia Division of Dam Safety has issued a conditional certificate for Huntsman Lake because the vegetated earthen auxiliary spillway cannot pass the Probable Maximum Flood (PMF) storm flows without breaching the structure.

Sponsor Concerns: The conditional certificate was issued to Fairfax County for Huntsman Lake in September 2005. It was issued because the existing vegetated auxiliary spillway would experience significant erosion during a storm event that exceeds 50% of the PMF. The conditional certificate requires the Sponsors to address the potential for severe head-cutting and erosion in the auxiliary spillway. The local Sponsors are very interested in resolving the issues raised by the Virginia Division of Dam Safety and complying with the Dam Safety regulations.

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 requested the assistance of NRCS to do the watershed planning and to identify the improvements necessary to obtain full dam safety certification.

In addition, the Sponsors are concerned that the existing open top of the principal spillway riser is vulnerable to clogging and to unsafe public access.

Soil Erodibility: In their 2001 report, Pohick Creek Dam Site No. 8 Emergency Spillway Investigation, Gannett Fleming, Inc. evaluated the geologic materials in the auxiliary spillway for use in the SITES auxiliary spillway erodibility analysis model. 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.

Floodplain Management: The Sponsors have identified flooding in the floodplain downstream as a primary concern. Fairfax County has participated in the National Flood Insurance Program since 1972, and realizes the value that Huntsman Lake provides in flood protection benefits, particularly for the roads. Huntsman Lake controls 2.32 square miles (1,482 acres) of the watershed above the affected properties.

Fairfax County has been very proactive in the protection of the Pohick Creek floodplain. In the early 1970's, USGS identified the 100-year floodplain within the watershed. The entire area was then zoned to prevent development. The six NRCS flood control dams were installed after the zoning was complete. The post-construction 100-year floodplain is substantially smaller than the zoned area.

Erosion and Sedimentation: As of 2008, Huntsman Lake had reached about 35% of its planned service life. The designed submerged sediment capacity was 173 acre-feet. As of 2008, there were 39 acre-feet of sediment in the pool area. This is about 22.5% of the designed sediment storage volume. Approximately 15 acre-feet of sediment were removed by dredging from 1985 to 1989. As expected, most of the sediment observed is present in the inlet channel areas of the structure. This material is primarily deposited sediments plus leaf and other organic debris. Sediment is not considered to be a major problem in this lake.

When the dam was designed, the watershed was not completely developed. The sediment capacity of the lake was based upon the anticipation that the watershed would be dominantly urban in use during the life of the dam. Most of the development in the watershed that was anticipated during the original design has been completed. The increase in impervious surface area has increased the volume of runoff into the streams feeding the lake. As a result, the stream banks have eroded, contributing sediment to the lake. Stormwater management, stream bank erosion control, and general erosion and sediment control in the watershed are the responsibility of the sponsors and will not be addressed in this plan.

Local Concerns: Huntsman Lake and the walking trail across the dam are used extensively by the local residents. There were some concerns about the effects on local traffic in the adjacent neighborhood during the construction period. Other issues included the potential for the permanent loss of trees and the aesthetics of the site when the lake is drained for rehabilitation.

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 around the lakes and downstream from the dam.
- Maintain existing fish and wildlife habitats around the lake.
- Preserve existing recreation opportunities.
- Protect water quality (the lake has trapped 54 acre-feet of sediment and attached nutrients in 35 years).

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 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 December 9, 2010, a Scoping Meeting was held at the Springfield District Office in Springfield, Virginia. Specific concerns and their relevance to the proposed action to the decision making process were identified. Input was provided by the Fairfax County District Supervisor, Fairfax County, the Northern Virginia SWCD, the Virginia Department of Game and Inland Fisheries, the Virginia Department of Environmental Quality, and the Virginia Department of Conservation and Recreation, Division of Dam Safety and Floodplain Management. These concerns are listed in Table A.

**Table A - Scoping Meeting Results For Rehabilitation of Huntsman Lake Dam
December 9, 2010**

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	No additional management needed.
Regional water resources plans (including coastal zone plans)	X		Consistency Certification will be needed.
Sewer utilities	X		Concerns about access to sewer line under dike or spillway after implementation. Minimize depth of fill over existing sewer line.
Sole source aquifers		X	N/A
Streams, Lakes, and Wetlands	X		The lake will be temporarily drained during construction.
Water quality	X		Increased sediment during implementation and Resource Protection Area impacts.
Water resources	X		Provides recreation value to community
Wild & scenic rivers		X	None present.
AIR			
Air Quality	X		Temporary effects during construction.
PLANTS			
Endangered and Threatened Species		X	None present.
Forest resources	X		Loss of trees. Ensure there is mitigation for the trees.
Invasive species	X		Investigate if any currently present and ensure none are introduced during implementation.
Natural areas	X		No State Designated Natural Areas present.
Riparian areas	X		Some riparian areas downstream of the dam will be impacted.

Item/Concern	Relevant to the Proposed Action		Rationale
	Yes	No	
ANIMALS			
Coral reefs		X	None present.
Ecologically critical areas		X	Fairfax County Park Authority has not identified any areas of concern.
Endangered and Threatened Species		X	None present.
Essential fisheries	X		Temporary downstream spring spawning impacts during drawdown.
Fish and wildlife (including coordination requirements)	X		Short-term impacts to fish and wildlife habitat. Fish in the lake will be lost when the lake is drained during rehabilitation.
Invasive Species		X	No invasive species will be introduced during rehabilitation.
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 residential impacts, such as street parking and impacts to lake access road (maintenance road) during implementation
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.
Parklands	X		Temporary interruption of use
Potable Water Supply		X	N/A
Public health and safety	X		Secure construction area during implementation (entire footprint of lake, spillway, and dam). Manage traffic on Golden Ball Tavern Court during implementation.
Public recreation	X		Temporary impact to trail across dam during implementation. Loss of recreational fishing for 3-4 years until natural recovery occurs.
Scenic beauty	X		Temporary impacts while lake is drawn down, loss of trees, and unsightly construction equipment.
Scientific resources		X	N/A
Social issues		X	None identified.

AFFECTED ENVIRONMENT

PLANNING ACTIVITIES

Under a contract with Fairfax County, A. Morton Thomas Associates conducted the sediment survey. Under a separate contract, Schnabel Engineering, Inc. performed the hydrologic and hydraulic analysis for the existing conditions and proposed rehabilitation alternatives. The analysis was presented in the report: Hydrologic and Hydraulic Analysis, Pohick Creek Watershed Dam No. 8, Huntsman Lake (Inventory Number: VA 05907), April 13, 2011. Portions of these documents were used in the development of this plan.

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. 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 Huntsman Lake is located in Fairfax County, Virginia. Huntsman Lake is on Middle Run. This tributary drains to Pohick Creek, which empties into the Potomac River at Pohick Bay. The Huntsman Lake watershed is 1,482 acres (2.32 square miles). Appendix B shows the location map for this watershed.

Topography: Huntsman Lake is located in the Piedmont Physiographic Province. The topography of the Piedmont is relatively flat to gently sloping. The elevation in the watershed ranges from about 220 feet at the dam to 410 feet at the watershed divide.

Soils: The soils in the watershed consist primarily of the Glenelg, Nathalie, and Urban Land soil series. The Hatsboro soil series is found along the majority of the streams within the watershed. Smaller areas of Barkers Crossroads, Beltsville, Codorus, Fairfax, Kingston, Meadowville, Rhodhiss, Rock Outcrop, Sumerduck, and Wheaton soils are also found in the watershed. At the project site, Barkers Crossroads soil is located along the abutments 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 Occoquan Batholith comprised of granite formed during the Cambrian period. The granite formation is overlain by alluvium deposited by Middle Run. The deposited alluvium can be as much as 20 feet in thickness and consists predominantly of sand, gravel, and silt with some cobbles and boulders. The alluvium is commonly micaceous from the mica-bearing rocks and residual soils prevalent in the Piedmont.

The Occoquan Granite found in the Occoquan Batholith consists of generally medium to coarse grained, light gray monzogranites and lesser amounts of granodiorite and tonalite. The rock in many exposures has a strong quartz-rod lineation and, in some places, two foliations.

Climate: The watershed has a continental, humid, temperate climate, and is characterized by warm to hot summers and rather cold winters. The average annual temperature is 58.2 degrees Fahrenheit, with an average minimum temperature in winter of 28.2 degrees Fahrenheit, and an average maximum temperature of 88.5 degrees Fahrenheit in the summer. The last frost of spring normally occurs in late April and the first frost in the fall occurs in late October. This provides a growing season of approximately 204 days.

The average annual precipitation is 39.34 inches, varying from about 33.65 inches in the driest years to about 44.5 inches in the wettest years. This precipitation is well distributed throughout the year, with the highest monthly precipitation occurring in May, July and August. Snowfall averages about 14.8 inches annually, with appreciable snow cover on the ground an average of 12 days per year.

LAND USE

The drainage area upstream of Huntsman Lake is 1,482 acres. This area was digitized using a digital land use map provided by Fairfax County. The 2002 USGS 1-foot digital orthophotographs were used as a backdrop. Table B lists the land use upstream of the dam. This table also lists the land use in the breach inundation zone below the dam. Appendix B contains the aerial photograph of the watershed.

Table B - Land Use In Acres

Land Cover Type	Drainage Area of Huntsman Lake (ac.)	Percent Of Total	Breach Inundation Zone (ac.)	Percent of Total
Residential/ Business	1,074	72.5	12.8	7.0
Woodland	310	20.9	165.7	90.7
Transportation	17	1.2	1.6	0.9
Open Space	51	3.4	2.6	1.4
Water	30	2.0	-	-
Totals	1,482	100	182.7	100

THREATENED AND ENDANGERED SPECIES

According to the Virginia Fish and Wildlife Information Service, there are no federally listed threatened or endangered plant or animal species that are likely to occur within a two mile radius of the project dam site. In addition, a search of the Virginia Eagles Nest Locator website, hosted

by the Center for Conservation Biology within the College of William and Mary, revealed no Bald Eagle nests within 1,000 feet of the project site. NRCS personnel conducted field visits to verify the presence of any federally listed species and determined that there were none in the project area. Therefore, NRCS has concluded that none would be affected by this project.

There is one federal species of concern (FS), state endangered (SE) animal species, the Brook Floater, Alasmidonta varicosa. This freshwater mussel is likely to occur within a two mile radius of the project dam, although there have been no confirmed sightings of this species. Seven state threatened (ST) animal species, the Bald Eagle, Haliaeetus leucocephalus; the Henslow's Sparrow, Ammodramus henslowii; the Appalachian Grizzled Skipper, Pyrgus wyandot, a butterfly; the migrant Loggerhead Shrike, Lanius ludovicianus migrans; the Loggerhead Shrike, Lanius ludovicianus; the Wood Turtle, Glyptemys insculpta; and the Upland Sandpiper, Bartramia longicauda, are likely to occur within two miles of the dam. Of these, three are also federal species of concern (FS). However, there are no confirmed sightings of these species. There are no state listed threatened or endangered plant species in the project area. Table C summarizes the potential occurrence of federal species of concern and state threatened and endangered species in the project area. The letters of comment received on this topic are located in Appendix A.

Table C - Threatened and Endangered Species Likely to Occur Within 2 Miles of the Project Dam

Animal Species	Scientific Name	Status*	Confirmed
Brook Floater	<u>Alasmidonta varicosa</u>	FSSE	No
Henslow's Sparrow	<u>Ammodramus henslowii</u>	FSST	No
Appalachian Grizzled Skipper	<u>Pyrgus wyandot</u>	FSST	No
Migrant Loggerhead Shrike	<u>Lanius ludovicianus migrans</u>	FSST	No
Bald Eagle	<u>Haliaeetus leucocephalus</u>	ST	No
Loggerhead Shrike	<u>Lanius ludovicianus</u>	ST	No
Upland Sandpiper	<u>Bartramia longicauda</u>	ST	No
Wood Turtle	<u>Glyptemys insculpta</u>	ST	No

* Species Legal Status: FT = Federally Threatened; FE = Federally Endangered; ST = State Threatened; SE = State Endangered; FS = Federal Species of Concern

The VDCR Natural Heritage Division stated in a December 7, 2010 letter that their "Biotics Data System does not document the presence of natural heritage resources in the project area. 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."

Confirmed occurrence of a listed species in a project area requires consultation with the appropriate State or Federal agency. Since there are no confirmed occurrences of Federal or State

listed threatened or endangered species, consultation with these agencies is not required. The U.S. Fish & Wildlife Service (USFWS), Virginia Department of Game and Inland Fisheries (VDGIF), and the Natural Heritage Division (NHD) of the Virginia Department of Conservation and Recreation (VDCR) were invited to the preliminary scoping meeting on December 9, 2010.

CULTURAL RESOURCES, NATURAL AND SCENIC AREAS, AND VISUAL RESOURCES

The National Register of Historic Places lists fifty-five sites in Fairfax County. Nine archaeological sites within one mile of the project area are listed in the State archaeological files. None will be affected by the proposed work. Additionally, there was one architectural site listed in the State architectural files within one mile of the project area. It will not be affected by the proposed work.

The National Historic Landmarks Program lists 118 sites, buildings or structures in Virginia, eight of which are found in Fairfax County. None of the eight buildings, objects or districts are within one mile of the project area, or will be affected by the project activities.

There are no designated State Natural and Scenic Area Preserves or visual resources in the project vicinity that will be affected by the proposed changes to the dam.

In February 2007, NRCS Cultural Resources Staff surveyed the dam area and downstream of the dam for indicators of archaeological and/or historical resources. A field view was conducted for the areas immediately adjacent to the dam, and for a distance of approximately 200 meters downstream. The ground cover is wooded, with very little surface visibility. The topography is mostly level with a 0-3% slope. The ground surface and creek bed was searched for quartz and other natural material that could have been used for the manufacture of stone tools. None were noted. No previously recorded archaeological sites are present within the area to be rehabilitated.

Phase I investigations were conducted by URS Corporation during December 2007 in the proposed project work limits. Twenty-eight shovel test pits were excavated during the Phase I investigation. Five artifacts were recovered. The materials did not constitute a site and were considered isolated finds. The isolated finds were considered insignificant and ineligible for inclusion on the National Register for Historic Places. In their report, Management Summary: Phase I Archaeological Survey for Huntsman Lake Rehabilitation, dated January 2008, URS Corporation concluded that no further work was needed. In a letter dated April 15, 2008, the Virginia Department of Historic Resources (VDHR) concurred with these findings and that no further archaeological investigations were warranted.

WATER QUALITY

Huntsman Lake is located on Middle Run which conflues with Pohick Creek, which then flows into the Potomac River at Pohick Bay. Pohick Creek has a total stream length of 35.61 miles from the headwaters of Rabbit Branch to Pohick Bay.

The 2008 305(b)/303(d) Integrated Water Quality Assessment and Impaired Waters Report did not list Middle Run as “impaired.” The Pohick Creek watershed is not considered a Public Drinking Water Source or Supply, and is ranked low for nonpoint source impaired lakes. The watershed is, however, rated high for urban nitrogen, phosphorus, and sediment contribution.

STREAMS, LAKES, AND WETLANDS

Middle Run is a tributary to Pohick Creek and has a base flow of about 2.3 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 Middle Run and Huntsman Lake are predominately forested.

The Huntsman Lake shoreline, inlet, and outlet were visually surveyed in October 2010 for wetlands. Approximately 0.4 acres of fringe wetlands were identified along the shoreline. The 28.6 acres of the lake are considered to be open water wetlands. Freshwater forested wetlands were found downstream of the outlet within the floodplain of Middle Run. Freshwater emergent wetlands were identified upstream of the inlet of the lake. Documentation regarding the methods used to make these determinations can be found in Appendix D.

FOREST RESOURCES

The surrounding watershed is part of the Piedmont Physiographic Province. An approximation of climax forest stands in this vicinity is indicated by remnant mature stands of American beech, Fagus grandifolia; several oak (Quercus) species; and American holly, Ilex opaca var. opaca. Chestnut oak, Quercus montana, and Mountain laurel, Kalmia latifolia, dominate parts of the dissected inner Coastal Plain. Due to the age of the forest, understory vegetation is limited to shade tolerant ground cover. The floodplain area has been zoned to prevent development and no changes to the forest composition are anticipated.

WILDLIFE RESOURCES

Wildlife species inhabiting the area around the lake include various thrushes and vireos, the scarlet tanager, several species of woodpeckers, gray and red squirrels, rabbits, gray fox, white-tailed deer, box turtles, opossums, and raccoons. Ducks, geese, herons, birds, otter, muskrat, and beaver may be found along the shoreline of the lake.

CHESAPEAKE BAY AND COASTAL ZONE MANAGEMENT AREAS

The Pohick Creek Watershed 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. Fairfax County has adopted local land use plans and ordinances which incorporate water quality protection measures consistent with the Chesapeake Bay Act Regulations. The regulations address non-point source pollution by identifying and protecting those lands that have the potential to impact water quality most directly. Those lands are called Chesapeake Bay Preservation Areas. The Chesapeake Bay Preservation Areas are further subdivided into those lands that protect and benefit water quality (Resource Protection Areas) and those lands that, without proper management, have the potential to damage water quality (Resource Management Areas). The majority of the watershed of Huntsman Lake is in a Resource Management Area. The area immediately adjacent to Middle Run and its tributaries, including Huntsman Lake, is in a Resource Protection Area.

Fairfax County is also included in Virginia's Coastal Zone Management Program, and is part of one of the eight Planning District Commissions in the Coastal Zone Area. The Northern Virginia Regional Commission is responsible for review of federal, state and local activities in its geographic area for consistency with the provisions of the Coastal Zone Management Act. Any dam rehabilitation efforts must consider these regulations and comply with them during the planning, design, and construction phases of the project.

SOCIAL AND ECONOMIC CONDITIONS

Huntsman Lake has a watershed of 1,482 acres, all of which lie within Fairfax County. Thus, the entire population within the watershed above and below the dam resides within Fairfax County.

Population and Race: According to 2005-2009 American Community Survey 5-Year Estimates by the Census Bureau for the population of the U.S., Fairfax County had a total population of a little over one million (1,012,751). Of the total population, about 67% (675,361) are white, 16% are Asian (162,393), and 9.2% (93,552) are Black or African American. Together these three groups make up 91.9% of the county's entire population. Hispanics of any race are the third largest minority group with 14%, or 141,343. "Other races" constitute 4.8% of the Fairfax County population with 48,389. Native Americans have a very small presence with only 0.4% of the population (3,722, having increased significantly from 2,561 counted in the 2000 Census).

Language Spoken at Home: The 2005-2009 population projections of the Census Bureau indicate that a little over sixty-six percent of the Fairfax County population, 5 years of age and over, speak only English at home. Almost 34% of this same age group speaks languages other than English at home. The single largest group speaking a language other than English at home, speak Spanish with 12.4% of the population (116,439). The next largest group, at 11.0%, speaks Asian and Pacific Island languages at home and 7.5% (70,696) speak Indo-European languages other than Spanish at home. Over 14% (135,652) speak English "less than very well."

Age: The 2005-2009 Census projections of the U.S. population indicate that the median age (middle point with ½ above and ½ below) of the population of Fairfax County was 37.1 (up from 35.9 in 2000). The median age for the state of Virginia was somewhat lower at 36.7 years while it was 36.5 for the entire nation. Residents in Fairfax County that were 65 years old or older totaled 9.3% (93,963, as compared to 76,818 and 7.9% in 2000). These statistics compare to 11.8% for the State and 12.6% of the nation. About 75% of the County population was over the age of 18. The same statistic for the state as a whole was 76.3%. Both the local and the state numbers are close to the national average estimated at 75.4%.

Education: Almost 92% of the residents in the County had a high school education or higher while the state-wide and national percentages for this were 85.8% and 84.6% respectively. Approximately 14% of the residents in the county, 25 years of age or older, have only a high school diploma or have passed an equivalency test. Over 78% of the County residents have some education beyond high school, including 30.9% with a bachelor's degree and 27.6% with graduate or professional degrees. Thus 58.5% of County residents have a bachelor's degree or higher. An additional 14.4% in the County have completed at least some college level work with 5.4% having obtained an associate degree. All of these numbers are well above the state-wide and national averages. State-wide and nationally, 26.3% and 32.0% respectively, of the population 25 years of age or older, has only a high school diploma or equivalency.

Employment/Unemployment, Class of Worker and Commuter Status: There are 787,905 Fairfax County residents who are 16 years of age or older according to the 2005-2009 Census Bureau projections. Approximately seventy-three percent (577,965) of these people are considered in the labor force pool. About 96.1% of the civilian labor force in the County was employed according to the 2005-2009 Census projections. About 3.9% 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 2005-2009 estimates for the state of Virginia as a whole which was 5.4%, and for the nation, which was estimated to be 7.2%. The Virginia Employment Commission estimated that the unemployment rate for Fairfax County in 2010 was 5.4%.

Fairfax County has a diverse and productive economy. According to the 2005-2009 Census projections, three sub-sectors of the local economy employ about 89% of the workforce: management and related professional occupations (56.4%); sales and office occupations (20.4%); and service occupations (12.5%). Occupations in the construction, extraction and maintenance make up 6.3% and production, transportation and related occupations make up only 4.3% of area jobs.

According to the 2005-2009 American Community Survey of the U.S. Census Bureau, private wage and salary employment constitutes 78.2% of all employment in Fairfax County with 60% of these working in private for-profit businesses, 9.3% being self-employed and 8.9% working for private nonprofit organizations. Government workers constitute 21.9% of the Fairfax County workforce with 13.7% employed by the federal government, 1.8% employed by state government and 6.4% employed by local government.

Of all Fairfax County residents employed according to the 2005-2009 Census data, about 50% of employed Fairfax County residents worked within Fairfax County, approximately 25% commuted to another locale within Virginia and about 23% commuted outside of the county and state (presumably to Washington, D.C. and Maryland).

Housing: The 2005-2009 Census estimates indicate that there were 391,103 housing units within Fairfax County with 94.2% occupied, 72.4% owner-occupied and 27.6% renter-occupied. The state-wide occupancy rate for Virginia as a whole reported in the 2005-2009 estimates was 90% and the national figure was 88.2%. The local and state-wide rates for owner-occupancy, 72.4% and 69.2% respectively, are higher than the national figure of 66.95%.

The normal pool area of the reservoir is approximately 28.6 acres in size and there are 14 town-home buildings with approximately 56 single family units that adjoin the frontage around it. In addition, 10 single family homes are located near the Huntsman Lake dam. The values of these properties are directly affected by the presence of the dam and impounded water. An additional 13 homes are located in the projected breach inundation zone below the dam. Residential property values downstream of the dam range between \$214,000 and \$378,000 with an average of \$311,000. The total value of residential property (structures and contents only, excluding land values) at risk below the dam is an estimated \$7,816,000.

Income: Median household income (householder and all others, related or not) estimated for the county for the 2005-2009 period was \$104,259. This compares to \$60,316 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 \$51,425. The median estimated household income for 2005-2009 for Fairfax County was 173% of the state median and 203% of the national median household income.

Median family income (householder and all others that are related) in Fairfax County for the 2005-2009 period was \$122,688 compared to \$92,146 per year for 1999¹. The current figure is significantly more, approximately 70% higher, than the \$72,193 in median family income for Virginia as a whole and almost 97% higher than the \$62,363 reported for the entire United States for 2005-2009.

With respect to per capita incomes, Fairfax County residents are estimated to have had per capita incomes of \$48,140 for the 2005-2009 period as compared to \$36,888 reported in 1999. Virginians reported per capita income of \$23,975 in 1999, and the estimated number for 2005-2009 is \$31,606, while the same figure for the entire United States was \$21,587 in 1999 and \$27,041 for 2005-2009. That makes the county per capita income figure for 2005-2009 52.3% higher than the State level and 78% above the national figure.

From a gender-specific perspective, males earn far more than females in the workplace at all levels. Full-time, year-round male workers in Fairfax County had a median income projected for 2006 of \$79,678, up from \$60,503 in 1999, while the same category of female workers in the

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.

county were estimated to earn \$56,192 in 2006, up from \$41,802 earned per year in 1999. Full-time, year-round male workers in Virginia had an estimated median income in 2006 of \$47,063, up from \$37,764, while the same category of females in Virginia earned an estimated \$36,062, up from \$28,035/year in 1999. The Virginia figures are very close to the national statistics of \$42,210 and \$32,649 for male and female full-time, year-round workers, respectively, up from \$37,057 and \$27,194.

Poverty and Homelessness: According to the 2005-2009 Census estimates, Fairfax County had 8,709 families living below the poverty level (3.4%), up from 7,507 families (2.9%) living below the poverty level in 1999. State-wide, 7.2% of Virginia's families had incomes below the poverty level during the 2005-2009 period, down slightly from 7% in 2000. At the national level, 9.9% of our families were estimated to live below the poverty level for the period 2005-2009, up from 9.2% in 2000.

As of January 2010, 1,544 people (892 family members and 652 individuals) were known to be homeless within Fairfax and Falls Church, VA (Falls Church is a small city wholly contained within Fairfax County with a population of 11,200) according to Fairfax County. Seventy-four percent of the single individuals who were homeless at that time were males. A full 80% of the homeless adults with families were females. Almost 48% (426) of the total number of homeless persons in families were children under the age of 12. Homeless minors in families between 12 and 18 made up an additional 23% (124) of the total number of persons in families who were homeless.

Recreation: Huntsman Lake provides recreation to homeowners and landowners in the area and is highly valued by the local community. Lake-based recreation and other activities associated with the reservoir include boating, fishing, cycling, walking and jogging, and some bird watching. A boat ramp located near the auxiliary spillway inlet provides access for small boats.

DESCRIPTION OF EXISTING DAM

Current Condition of the Dam: A visual inspection of the dam was conducted on October 8, 2010. 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 concrete of the principal spillway appears to be in good condition; however, the riser was not inspected. In 2008, Fairfax County repaired a 9"x18" hole near the outlet of the principal spillway conduit using a slip-lining treatment of hardened resins. Subsequent video camera photography of the interior of the repaired conduit showed the conduit to be in good condition. According to Fairfax County's Reinspection Report dated March 24, 2009, the slide gate at the base of the riser was last activated on November 10, 2008.

In 1994, Fairfax County installed a combination of relief wells, trench drains, and embankment drain pipe outlet linings to remediate observed seepage problems along the downstream toe of the dam. No wet areas along the downstream groins were noted. Flow was observed in the embankment drains. Piezometer readings, taken by Fairfax County on three month intervals, indicate that the phreatic line is well below the embankment surface. The flow rates of three of the four embankment drains are also measured quarterly. The flow rates in the fourth drain cannot be measured because the outlet is partially submerged.

Potential Dam Safety Deficiencies: The Virginia Division of Dam Safety issued a conditional use certificate for Pohick Creek Watershed Dam No. 8 because the vegetated earthen auxiliary spillway does not have the integrity to pass the Probable Maximum Flood (PMF) storm flow without breaching the structure. During the planning process, NRCS verified this condition. NRCS further determined that the auxiliary spillway also does not meet the NRCS stability criteria for a vegetated spillway. However, if the integrity and stability criteria were met, the auxiliary spillway would have adequate capacity to pass the PMF without overtopping the dam with the exception of a short section of the dam embankment (about 40 feet) adjacent to the auxiliary spillway that is approximately 0.6 feet too low.

In addition, the principal spillway riser was installed with an open top rather than with the closed top more commonly used in urban settings (Figure 1). The Sponsors are concerned that the open top of the riser could be a safety hazard to the public because of its accessibility.

As-Built Dam Specifications: According to the As-Built drawings, the dam was completed in May 1973. The earthfill used to construct the embankment was obtained from the surrounding floodplain and the auxiliary spillway. According to the original design report, the borrow area includes alluvium and residual soils. The alluvium varies from sandy silt to clayey or silty sand, clayey silt to silty clay, and coarse silty sand or gravel. Colluvial soils overlay the alluvium and contain clayey silt. The residual soils in the auxiliary spillway excavations are sandy silt, fine silty sand, or silty sand.

The dam embankment is comprised of two zones of earthfill. Zone 1, the "Core" material, is silty clay and Zone 2, the "Shell" material which covers the crest and downstream slope, is silty sand. The top of the embankment is 15 feet wide with 2.5 horizontal to 1 vertical side slopes.

There is a 10-foot wide wave berm on the upstream slope that is located at an elevation slightly higher than the principal spillway crest. The embankment slope below the wave berm is 3:1. In 1988, rock riprap was added to the berm of the upstream embankment by Fairfax County for wave protection.



Figure 1. Existing open top riser at Huntsman Lake.

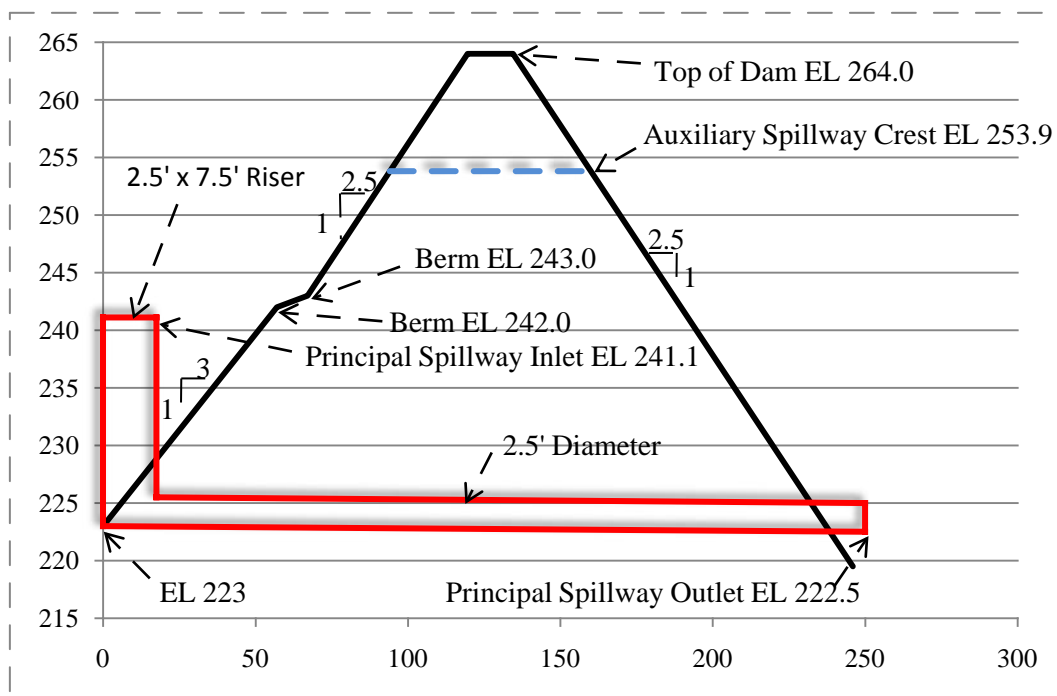


Figure 2. Cross-section of dam.

According to the As-Built drawings, the top of dam was constructed 42.5 feet above the downstream toe of the embankment with an allowance of 1.0 foot of settlement for a settled height of 41.5 feet. The 2008 field survey shows an average dam height of 41.5 feet above the downstream toe at a nominal elevation of 264.0 (NAVD 88). The top of the dam varies from 263.4 to 264.3 (NAVD 88). The one low section, approximately 40 feet long, is located near the auxiliary spillway. The crest of the dam extends approximately 680 feet from the right abutment (looking downstream) to the auxiliary spillway. Figure 2 shows a cross-section of the dam.

Principal Spillway: The principal spillway is a 255-foot long, 30-inch-diameter, reinforced concrete pipe with a 2.5x7.5 foot (interior dimensions), 17.6 foot high, NRCS standard open reinforced concrete riser and a plunge pool outlet. The riser controls the normal pool with a weir, 15 feet long, at the top of the riser. 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 structurally sound, it does not meet current NRCS seismic criteria.

Auxiliary Spillway: A 75-foot-wide vegetated earthen channel auxiliary spillway was constructed in the left abutment. The As-Built drawings show a 30-foot-long level control section approximately 10.2 feet below the top of dam with a 155-foot long, 2% inlet slope. The outlet has a grade of 2.5% for 227 feet. The field surveyed control section elevation is 253.9 for an auxiliary spillway depth of 10.1 feet. The vegetation lining the spillway is well maintained. The spillway outlets into a wooded slope leading to a defined channel. No flow has been observed in the auxiliary spillway. The boring logs performed by Gannett Fleming in 2001 indicate that the topsoil in the auxiliary spillway is composed of a mixture of sandy silty clay, silty sand, and sandy silt. Although the capacity of the auxiliary spillway is sufficient to pass the PMF, the soils in the auxiliary spillway do not have the integrity or stability to pass the PMF without breaching.

Internal Drain System: The As-Built drawings indicate that the dam has a trench drain that is composed of a two-stage graded filter surrounding a perforated corrugated metal pipe. In 1994, Fairfax County installed a combination of relief wells, trench drains, and embankment drain pipe outlet linings to remediate observed seepage problems along the downstream toe of the dam. Water levels in three piezometers are checked every three months.

Appurtenant Structures: The upstream end of the auxiliary spillway inlet is paved, serving as a boat ramp into the reservoir. From the ramp, a 5-foot wide asphalt path extends up to the top of the dam and across to the right abutment. A concrete-encased sanitary sewer line runs under the left side of the dam embankment near the toe of the right auxiliary spillway training dike. The sewer line is not encased in concrete downstream of the dam. Significant excavation or fill over the sewer line must be avoided.

Baseline Survey: A field survey, conducted in 2008, referenced to the North Atlantic Vertical Datum of 1988 (NAVD 88), indicated that the vertical datum used for design and construction is about 1.0 feet higher than NAVD 88. The differences are shown in Table D. Elevations used in this report are referenced to NAVD 88. However, the vertical datum used by Fairfax County is

the National Geodetic Vertical Datum of 1929 (NGVD 29). The NGVD 29 datum was used when the dam was built and will be used for rehabilitation.

Table D – Comparison of Dam Elevations

Location	Elevations (feet)		
	As Built (NVGD 29)	2008 Survey (NAVD 88)	Difference
Principal Spillway Crest	242.1	241.1	1.0
Top of Dam (Settled)	265.0	263.4-264.3	0.7-1.6
Auxiliary Spillway Crest	254.8	253.9	0.9
Principal Spillway Outlet Invert	223.5	222.5	1.0

The field survey data was used to estimate the area of the normal pool. This data, combined with areas shown in the Design Report and the aerial topographic survey provided by Fairfax County, was used to develop the sediment and the floodwater retarding storage of the reservoir. The field survey data were also used in all of the analyses, including HEC-RAS and SITES, and throughout this report. The use of a different vertical datum did not affect the results of the sediment analysis or the hydraulic modeling.

Precipitation Data: The dam was designed using criteria in Engineering Memorandum 27 (March 1965), and its Supplement 1 (March 1966) and on precipitation data based on United States Weather Bureau Technical Paper 40 (May 1961) and Technical Paper 49 (1964). Current data is contained in NOAA Atlas 14, *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 E, the current data is slightly different than that used for design of the dam. However, the existing principal and auxiliary spillways have adequate capacities to meet current NRCS criteria.

Table E. Comparison of Precipitation Data

Event	Precipitation (inches)	
	Design	Current
100-year, 24-hour	8	8.34
100-year, 10-day	14	12.20
Auxiliary Spillway Hydrograph	11.1	11.13
Freeboard Hydrograph	27.3	27.6

Sedimentation: Huntsman Lake was designed to store 100 years of sediment in the pool area. The submerged sediment storage capacity was 173 acre-feet at a planned sediment accumulation rate of 1.73 acre-feet per year. Based upon the sediment survey, the volume of submerged sediment in the pool in 2008 was 39 acre-feet. Approximately 15 acre-feet of sediment were removed by dredging from 1985 to 1989. The Huntsman Lake dam trapped a total of 54 acre-

feet of sediment in its first 35 years. The sedimentation rate for this time period was 1.54 acre-feet per year. Although the vast majority of the development in the watershed occurred during this same time, the historic sedimentation rate is less than the design sedimentation rate. The future sedimentation rate is projected to be the same as the historic rate. Based upon the designed submerged sediment capacity and the existing volume of stored sediment, there were 134 acre-feet of storage remaining in the reservoir in 2008. At that time, there were 87 years of submerged sediment life remaining.

There were 10 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 0.1 acre-feet per year. The estimated volume of aerated sediment in the pool in 2008 was 3.0 acre-feet. The available aerated sediment storage capacity is 7.0 acre-feet. Based upon the historic accumulation rate of 0.087 acre-feet per year, there is over 80 years of aerated sediment storage capacity.

STATUS OF OPERATION AND MAINTENANCE

Operation and maintenance of the structure is the responsibility of Fairfax County. 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. Fairfax County has done an excellent job of operating and maintaining this structure. The most recent inspection was conducted October 8, 2010.

STRUCTURAL DATA

The structural data for the existing condition of the dam and watershed is described in Table F. The sediment data is based upon the 2008 sediment survey.

Table F - Existing Structural Data for Huntsman Lake

Local Name	Huntsman Lake
Site Number	8
Year Completed	1973
Cost	\$176,362
Purpose	Flood control
Drainage Area, mi ²	2.32
Dam Height, feet	41.5
Dam Type	Earthen
Dam Volume, yds ³	76,064
Dam Crest Length, ft	680
Storage Capacity, ac-ft	678
Submerged Sediment, ac-ft	134
Aerated Sediment, ac-ft	7
Flood Storage, ac-ft	537
Principal Spillway	
Type	Concrete
Riser Height, ft	17.6
Conduit Size, inches	30
Stages, no.	1
Capacity, cfs	111
Energy Dissipater	Plunge Pool
Auxiliary Spillway	
Type	Earthen
Width, ft	75
Capacity, % of PMF	100*
Normal Pool Elev.	241.1
Flood Pool Elev.	253.9
Top of Dam Elev.	264.0

*With the exception of one short section of the embankment, the capacity of the auxiliary spillway is sufficient.

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 top of the dam and with the existing principal spillway riser and earthen auxiliary spillway blocked.

Current NRCS policy in Technical Release No. 60, *Earth Dams and Reservoirs* (TR-60), requires an evaluation of both the short duration (6-hour) and the long duration (24-hour) Probable Maximum Precipitation (PMP) storms to assess the capacity and integrity of the earthen auxiliary spillway. The PMF is the runoff from the PMP event. Only the short duration storm is used to check the stability of the spillway.

According to the Virginia Division of Dam Safety conditional operation and maintenance certificate, the auxiliary spillway of Huntsman Lake can only safely pass 50% of the runoff associated with the 6-hour PMP without breaching. The 6-hour PMP storm is 27.6 inches of rainfall.

The maximum breach discharge of 42,272 cfs was computed using the criteria in TR-60. The breach hydrograph was developed using the equation for a curvilinear hydrograph in Technical Release 66, *Simplified Dam-Breach Routing Procedure*. The elevations and Stage-Area relationship were developed using a combination of the field survey data, the data in the Design Report, the As-Built drawings, and an aerial topographic survey provided by Fairfax County. This same data was used in the SITES analysis. The depth of water at failure is about 40 feet.

Modeling of the dam breach hydrographs in the stream and floodplain downstream of the dam was performed using the unsteady flow HEC-RAS model utilizing geometry data from a HEC-RAS model of the Pohick Creek Watershed streams provided by Fairfax County. The geometry data included cross sections developed from a Triangular Irregular Network (TIN) of the land surface created from the mass points and breaklines, and surveyed structure data. Cross sections were extended when necessary using the TIN. The analysis was performed from the dam downstream on Middle Run and Pohick Creek to the Pohick Bay, more than eight miles downstream of the dam. The inundation area shown on the map was terminated about four miles downstream of the dam at the Pohick Road Bridge across Pohick Creek, where the flow from the breach would be within the 100-year floodplain.

Manning's roughness coefficient "n" values of 0.04 in the channel and 0.013 to 0.1 in the overbank were used. The range of n values in the overbank area reflects a wide variety of land cover from paved roads to dense woods. Contraction and expansion values of 0.1 and 0.3, respectively, were used except that, immediately upstream and downstream of roads, values of 0.3 and 0.5 were used. Results of the breach analyses are shown in Appendix C in Table C2 and on the Breach Inundation Map.

The breach analysis was used to identify a breach inundation zone which was overlaid on the aerial map (See Appendix C). A breach of the Huntsman Lake dam would jeopardize 13 homes and place approximately 36 residents at a fatal risk. Structures would be inundated by water depths ranging from less than 1 foot to 12 ft. Velocities would range from 2 to 6 feet per second (fps). Additionally, commuters on three roads would also be at a fatal risk due to flooding of the roadways by 6 to 12 ft and velocities within the bridge or culvert of 6 to 8 fps. One of these roads is a state numbered road, while the other two are local roads. Two additional state numbered roads would not be flooded, but would have velocities within the bridge or culvert of 12 to 19 fps. Flooding of the state numbered roads would be likely to disrupt traffic, especially during rush hours, and emergency services. Four important utilities (sanitary sewer, telephone, water, and electric) would also be at risk. The sanitary sewers and gas line are underground and subject to channel scour where the velocities would be 16 to 22 fps. The telephone and electric lines are overhead where the floodplain velocities would be 5 to 10 fps.

In addition to the damage caused by the water, a significant volume of sediment would initially be flushed downstream in the event of a catastrophic breach. Highly erodible sediment

remaining in the sediment pool would continue to cause persistent sediment deposition problems for the downstream channel and floodplain. A summary of the impact on structures, roads, and utilities is included in Table C2.

The environmental damages of a dam failure would be significant. About four 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 recreational use of bike and hiking trails and may cause water quality problems.

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. These streams could develop headcuts that could migrate upstream through the watershed, eroding the banks and channel bottoms and adding additional sediment deposition into the stream system.

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: Huntsman Lake was originally constructed in 1973 for the purpose of protecting downstream lands from flooding. It was designed as a SCS class (c) (high hazard) structure with a 100-year design life. The hazard class of the structure remains 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.

Current NRCS policy in TR-60 requires an evaluation of both the short duration (6-hour) and the long duration (24-hour) PMP storms to assess the capacity and integrity of the earthen auxiliary spillway. Only the short duration storm is used to check the stability of the spillway.

According to the Virginia Division of Dam Safety conditional operation and maintenance certificate, the auxiliary spillway of Huntsman Lake can only safely pass 50% of the runoff

associated with the 6-hour PMP without breaching. The 6-hour PMP storm is 27.6 inches of rainfall.

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 Huntsman Lake.

Sedimentation: 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 flood 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 detention 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.

The land use in the watershed above the dam is 72.5% Residential/Business, 20.9% Woodland, 1.2% Transportation (roads), 3.4% Open Space, and 2.0% Water. These uses are not expected to change significantly. Therefore, the future sediment accumulation rate in Huntsman Lake is expected to be the same as the historic rate. Based upon the future sediment deposition rate of 1.54 acre-feet per year, the remaining sediment storage life of Huntsman Lake in 2008 was 87 years. Planned maintenance by Fairfax County includes removal of sediment. 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 Huntsman Lake has 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. At the present time, Huntsman Lake can pass about 50% of the 6-hour PMF before erosion in the auxiliary spillway would cause a breach to occur. The overall potential for hydrologic failure of

Huntsman 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.

The principal spillway pipe for Huntsman Lake does not exhibit signs of seepage. Seepage from the principal spillway pipe provides a low potential for failure. Since additional relief wells, trench drains, and embankment drains have been installed, and are regularly monitored, there is also a low potential for failure due to seepage through the foundation. No problems with the sanitary sewer pipe under the embankment are anticipated since it is concrete-encased in the section under the embankment. The potential for a seepage failure of Huntsman 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 Pohick Creek 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. However, when the riser was evaluated using the criteria in NRCS Technical Release 68 - *Seismic Analysis of Risers*, which was developed after the design and installation of Huntsman Lake, the existing riser did not have the required Factor of Safety for overturning.

Material Deterioration: The materials used in the principal spillway system, 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 shows no material deterioration. Failure of the dam is not likely to occur through material failure.

Conclusion: At the present time, the Huntsman 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. This type of failure could occur at any time during the remaining life of the structure. Although the site is not in an area of significant seismic risk, the principal spillway riser does not meet current NRCS criteria and should be replaced. There are no signs of seepage and the material components are in satisfactory condition.

CONSEQUENCES OF DAM FAILURE BY OVERTOPPING

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 no advanced warning. Dam failure is assumed to occur when water begins to overtop the embankment due to the unresolved blockage of the principal and auxiliary spillways. It is assumed that structural collapse would occur quickly and result in a release of 1,450 acre-feet of water and sediment, beginning with a wall of water that is about 40 feet high.

The breach analysis indicates that a breach of the Huntsman Lake dam would jeopardize 13 homes and place approximately 36 residents at a fatal risk. Additionally, commuters on three roads (Thornecliff Lane, Hooes Road and Gambrill Road) would also be at a fatal risk. At least four utilities (sewer, water, electric, gas) could also be impacted. Access to emergency services would be limited for 94 residences and one church building.

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 that cross Middle Run at Thornecliff Lane (2,200 Average Daily Traffic (ADT)), Hooes Road (no data available), and Gambrill Road (8,400 ADT) daily. Although Fairfax County Parkway (48,000 ADT) will not be inundated, the bridge could be undermined. Huntsman Boulevard (7,200 ADT), located upstream of the lake, could be affected when the water level is five feet above the auxiliary spillway crest elevation.

The economic damages would include the damages to the homes, roads, and utilities, and the loss of the lake and corresponding decreases in property values and recreational opportunities. The residences at risk in the area of the floodplain subject to a breach of Huntsman Lake Dam have structure and content values estimated at \$7,816,000. In addition, potentially impacted infrastructure is valued at \$11,370,000. Infrastructure damage caused by a catastrophic breach would include the damages to Thornecliff Lane, Hooes Road and Gambrill Road, and the five utilities. Economic damages resulting from these losses would be approximately \$12,954,000. Long-term costs of the loss of these infrastructure components would also be incurred due to the need for alternate routes during the replacement period.

In addition, 94 townhomes would be cut off when Thornecliff Road is overtopped by 11 feet of water in the breach. The road and the bridge would be unusable for several months and there is no other entrance to the neighborhood. The church building on Selgar Road may have limited or no access due to the overtopping of Hooes Road.

Other economic damages from a catastrophic breach would be: a) lost recreation opportunities with the lake gone; b) changes in real property values and the tax base associated with increased flooding in the future; and c) 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 Huntsman Lake Dam would result in a total estimated \$13,182,000 in damages.

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

the event of a catastrophic breach. At its full design capacity, Huntsman Lake has a total sediment storage volume of 183 acre-feet. Highly erodible sediment remaining in the sediment pool would continue to cause persistent sediment deposition problems for the downstream channel and floodplain. Approximately four 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. The nutrients in the sediment could also cause water quality problems in the future. Over time, the sediment and attached nutrients would migrate downstream into the Potomac River, and eventually to the Chesapeake Bay.

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 streams and stormwater drains feeding the reservoir. These channels would develop headcuts that would migrate upstream to the first culvert. The culverts will stop the headcutting from proceeding upstream. Downcutting and widening will continue to occur in the lake bed.

FORMULATION AND COMPARISON OF ALTERNATIVES

The stated objectives of the Sponsors for the Huntsman Lake Rehabilitation Plan are: 1) to bring the Huntsman Lake dam into compliance with current dam safety and design criteria; 2) to maintain the current level of flood protection provided by Huntsman Lake; and 3) to address the local residents' concerns. The first two objectives and most of the third objective 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 both the locally preferred solution and other alternatives identified through the planning process.

FORMULATION PROCESS

Formulation of alternative rehabilitation plans for Huntsman 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 77-year period of analysis, which includes a two year design and installation period and 75 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 Huntsman Lake into compliance with current dam safety and design criteria. See Table G. The National Economic Development (NED) Alternative is the federally assisted alternative with the greatest net economic benefits.

Table G - Alternative Plans of Action

1. No Federal Action
2. Decommission the Dam
3. Non-Structural – Relocate or Floodproof Structures in the Breach Zone
4. Rehabilitate the Dam
5. NED Alternative

ISSUES THAT MUST BE CONSIDERED IN EVALUATION OF ALTERNATIVES

Issue 1. Prevent a Breach of the Auxiliary Spillway: There are four main 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. At Huntsman Lake, the inlet section is 155 feet long at a 2% grade. 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 located where the auxiliary spillway crosses the centerline of the top of the dam. It is 30 feet long and 75 feet wide at Huntsman Lake. The purpose of the level 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 is 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. At Huntsman Lake, the constructed outlet section has a 2.5% grade for 227 feet. 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.

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.

There are three main techniques for preventing an auxiliary spillway from breaching. For a vegetated earthen spillway, the control section is 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. An example of a structural solution would be installation of a cutoff wall that would be buried in the auxiliary spillway to keep headcuts from migrating upstream. This would not prevent soil erosion or gully formation downstream of the cutoff wall. Many variations of these structural solutions are possible.

Subsidiary Concerns: At the present time, about 40 feet of the dam is slightly lower than needed to contain the maximum flow through the auxiliary spillway. Fill will be placed on the top of the dam to bring it up to the required elevation. A second concern is the location of the existing sanitary sewer line. Realignment of the auxiliary spillway will be necessary to avoid impacts to this utility.

Issue 2. Replace the riser of the principal spillway: The existing open top of the principal spillway riser is vulnerable to access from the public and it is also more easily clogged with floating debris than a closed top riser. The riser itself does not meet the current NRCS seismic criteria. As part of the rehabilitation of this dam, the riser will be completely removed and replaced with a baffle top riser. 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. The estimated cost for replacing the riser is \$264,000. Implementation of the riser will require draining the lake for up to 8 months. Figure 3 shows a riser similar to the one that will be installed.

Issue 3. Sediment life of structure: The calculated sediment life of this structure is 85 years. NRCS and the Sponsors have agreed to use 75 years as the planned life of the rehabilitated structure. Therefore, the sediment life is not a factor in the selection of alternatives



Figure 3. Example of a baffle top riser.

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: Decommissioning is 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 rehabilitation alternative under NRCS policy. If the dam is removed, the 13 homes in the breach zone will no longer be at risk from flooding caused by a dam breach. All of these homes are located outside of the 100-year floodplain. The downstream bridges and utilities would have to be protected. Federal policy requires that induced damages be mitigated.

Removal of the dam embankment would require removal of about 76,000 cubic yards of material. About 5.2 acres of trees would be planted over the dam site. The 39 acre-feet (62,900 cubic yards) of sediment would be stabilized or removed. The function and stability of approximately 8,750 feet of stream channel would be restored and 28.6 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. However, the cost for decommissioning the dam site alone is about 10 million dollars which is substantially more than the cost of the alternatives studied in detail. Table H lists some of the components of decommissioning the dam.

Table H – Major Components of Dam Decommissioning

Items of Work	Quantities	Unit cost	Cost
Fill removal and disposal	76,000 cubic yards	\$6/CY	\$456,000
Channel Restoration	8,750 LF	\$500/LF	\$4,375,000
Accumulated Sediment to be removed	62,900 cubic yards	\$59/CY	\$3,711,100
Forested Riparian Buffer to be created in pool area	28.6 acres	\$50,000/acre	\$1,430,000
Forested Riparian Buffer to be created in dam area	5.2 acres	\$50,000/acre	\$260,000
Cost of structure removal only*			\$10,232,100

* Other costs would include mitigation for induced damages, floodproofing of bridges and utilities, loss of recreation, and reduced property values.

Rehabilitate the Existing Vegetated Auxiliary Spillway: The control section of the existing vegetated earthen auxiliary spillway would need to be widened and lengthened in order to meet the stability and integrity criteria of TR-60. It is approximately 150 feet from the east edge of the auxiliary spillway to the nearest row of townhomes. A minimum of five townhomes would be removed. The assessed value of the land and building for one townhome in that neighborhood is about \$284,000. Golden Ball Tavern Court, the road adjacent to the auxiliary spillway, has an average daily traffic count of 1,900 vehicles. The neighborhood currently has three entrances from Golden Ball Tavern Court. Removal of the road would eliminate access to all of the townhomes. If a single entrance was created, it would force residents and emergency services to use a circuitous route through the neighborhood. It would also necessitate construction of more parking to accommodate the vehicles that currently park along the road.

Rehabilitate the Auxiliary Spillway with Secant Pile and Reinforced Concrete Cutoff Walls: This alternative would require installation of a concrete secant pile wall at the end of the auxiliary spillway outlet and a reinforced concrete wall at the end of the control section. Installation of a secant pile wall could adversely affect the sewer line that is adjacent to the auxiliary spillway. This would result in additional cost for the Sponsor. The estimated cost of the construction is \$2,800,000. This does not include the design costs or impacts to the sewer line. Therefore, the cutoff wall solution was not considered in depth.

Non-Structural - Relocation or Floodproof Structures: Relocating or floodproofing the 13 homes in the breach zone of the dam will not reduce the hazard classification of the dam. Therefore, there will be no change in the need to bring the dam into compliance with the Dam Safety laws. Rehabilitation of the dam to eliminate the potential for a breach will protect these houses.

DESCRIPTION OF ALTERNATIVE PLANS CONSIDERED

No Federal Action: With this alternative, no federal funds would be expended. Since the Huntsman 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 of the dam. NRCS would still have the technical responsibility of approving the Sponsors’ solution because the floodwater retarding structure is still under a Project Agreement and an Operation & Maintenance Agreement between the local Sponsors and NRCS.

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 as it would induce flooding downstream. This option would not meet the Sponsors’ goal of maintaining existing levels of flood control.

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 used as the No Federal Action alternative. The estimated total cost would be \$2,677,000.

Rehabilitate dam: Five alternatives were considered during the planning process. Of these, four were eliminated from detailed study because of cost or because they were not adequate to address the problem. The only alternative for dam rehabilitation is to realign the existing auxiliary spillway and armor it with either Roller-Compacted Concrete (RCC) or Articulated

Concrete Blocks (ACBs), and then cover the armor with topsoil and revegetate the site. It is necessary to armor the auxiliary spillway because an unarmored, vegetated auxiliary spillway would not meet the TR-60 stability and integrity criteria. However, due to the visibility of this site to the public, the residents would prefer a solution with the appearance of vegetation. Figure 4 shows how ACB armor looks prior to the addition of topsoil.



Figure 4. Example of ACB installation.

Configuration. The spillway configuration would be changed to avoid impact to the sanitary sewer line, to increase its distance from the downstream residences, and to decrease the acreage of woods to be cleared. At the present time, the inlet section, control section, and constructed outlet section are in a straight line with each other beginning at the lake and ending at the tree line. With the proposed modification, the inlet channel would be curved toward the lake and would extend downstream of the centerline of the dam with the control section downstream of the curve. Since the water in the inlet section has very little velocity, there would be no erosion in a curved inlet section. The constructed outlet must be straight and in line with the control section to prevent the excess velocities that would occur in a curved section with a downhill grade. With the proposed inlet configuration, the control section and the constructed outlet section would be rotated clockwise from their current location. The constructed outlet section would extend to the valley floor instead of stopping at the tree line. Both the right and left training dikes would also be extended to the valley floor. See Figure 5.

Extent of armor. The armor in the auxiliary spillway would extend from the upstream edge of the level section to the valley floor. The constructed outlet section would be a chute 320 feet long with a 40-foot long stilling basin. An underground cutoff wall would be constructed at the

end of the stilling basin outlet to prevent a headcut from undermining the outlet. The cutoff wall would extend approximately 1.5 feet below the elevation of the Middle Run channel. Training dikes would be installed along the auxiliary spillway outlet to the valley floor on both sides. These would be armored on the inside slopes and covered with topsoil and vegetation. A small diversion channel would be constructed along the outside of the left (looking downstream) training dike to carry flows from a small channel that drains the adjacent property. All of the armor would be covered by topsoil and vegetation.

Drainage system. Since this dam has a fairly high ground water table on the downstream side, a drainage system would be installed under the stilling basin and the end of the auxiliary spillway to divert ground water away from the area. This system would consist of 12 inches of fill and a network of perforated PVC pipes. The pipes would outlet along the sides of the auxiliary spillway and flow into the stream on the right side and into the diversion channel on the left.

Effects of auxiliary spillway flow. According to the Schnabel Engineering report, damage to the auxiliary spillway and downstream areas will not begin to occur until an event greater than the 500-year storm event. Damage to the auxiliary spillway would be limited to just the topsoil and grass removal since the armor underneath the soil would provide the structural integrity necessary to prevent a breach. Little, if any, erosion damage would occur for storm events equal to or smaller than the 500-year storm event. Any necessary repairs would be addressed as part of the routine operation and maintenance of the site.

Description of the Construction Area. An existing paved driveway from Golden Ball Tavern Court to the inlet of the auxiliary spillway is the most likely access route. This would require no clearing of trees or shrubs unless the road would need to be widened for construction vehicles.

During construction, the wooded area immediately downstream of the auxiliary spillway outlet would be cleared. In addition, the small stand of trees on the upstream side of the dam between the auxiliary spillway inlet and the dam embankment would be removed, as required by Division of Dam Safety rules.

The total project footprint is calculated to be 3.4 acres, including the removal of 1.4 acres of trees. Within the project footprint, an additional 1.1 acres will be disturbed. A total of 2.5 acres of trees would be planted on-site and elsewhere in the watershed to mitigate for the disturbance to the site. The total cost of planting trees is estimated to be approximately \$75,000.

About 0.1 acres of the proposed auxiliary spillway outlet would be within the property of the Lakewood Hills #1 Community Association but outside the stormwater easement. In addition, about 0.6 acres of the Community Association property would be within the construction limits. Figure 5 shows the property boundaries and existing easements for the rehabilitation alternative.

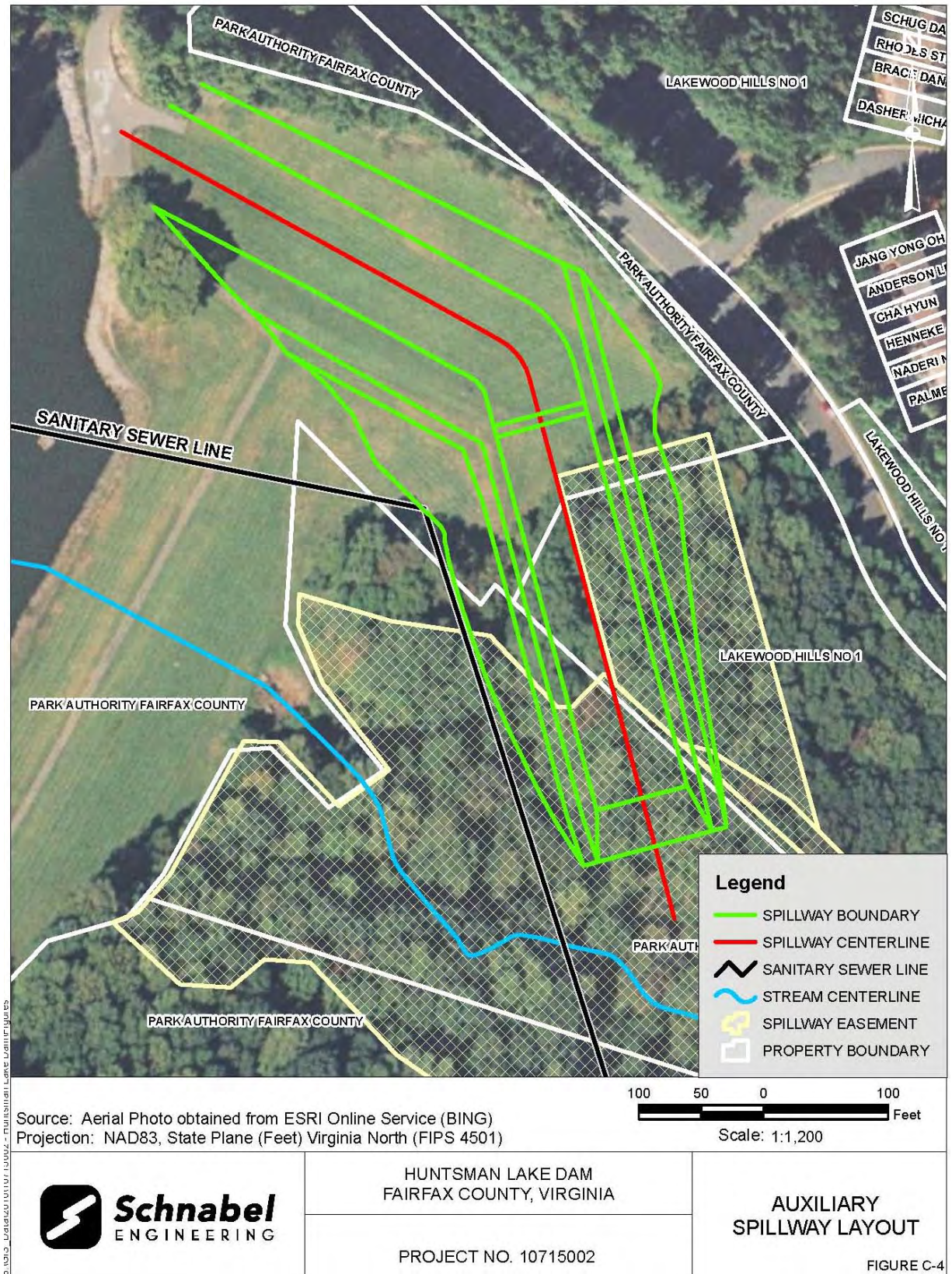


Figure 5. Plan view of armoring alternative.

Armoring with Articulated Concrete Blocks: Articulated Concrete Blocks (ACBs) are individually constructed concrete blocks that are cabled together to form a continuous erosion-resistant mattress that would be used to cover the auxiliary spillway floor and the inside slopes of the training dikes. The proposed blocks are “open cell” which provides about 20% open space within and around the block. Geotextile fabric, four inches of gravel, and a geogrid 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 geogrid. Topsoil would be placed in the open spaces in and around the blocks and in a layer six inches thick over the blocks to allow more extensive vegetation of the site and to conceal the armoring. In the PMF storm event, an estimated 5,200 SY of topsoil and vegetation would be eroded from the site. It would cost about \$102,600 to restore the site and would take about one month. There would be some environmental damages from the deposition of the eroded soil.

The ACBs can be manufactured offsite and trucked in for installation which reduces the amount of space needed for a staging area. The ACBs would only be used for the auxiliary spillway and training dikes. The stilling basin would be constructed of reinforced concrete. The estimated construction cost for armoring with ACBs is \$2,116,000. The total cost is approximately \$2,677,000.

Armoring with Roller-Compacted Concrete: Roller-compacted concrete is a non-reinforced concrete that is durable and easy to install. The RCC would be used to armor the auxiliary spillway from the upstream end of the level section to the valley floor. The stilling basin would also be constructed of RCC. The RCC would be covered with a foot of earthfill and six inches of topsoil and vegetation. Soil material excavated from the spillway would be used to construct the training dikes. These would be armored on the inside edge with RCC and covered with topsoil and vegetation. In the PMF storm event, an estimated 5,200 SY of topsoil and vegetation and 1,750 CY of earthfill would be eroded from the site. It would cost about \$147,600 to restore the site and would take about one month. There would be some environmental damages from the deposition of the eroded soil.

However, RCC may not be practical for use at Huntsman Lake because it has a very limited window of installation time. Each batch of concrete must be mixed and installed within a time window of less than one hour. Since the available working space on site is limited, the assumption was made that the RCC would be mixed at a ready-mix plant that is approximately six miles away. In the high traffic conditions common to this northern Virginia community, it may be difficult to meet the time criteria. This option may not be feasible due to these constraints. The estimated construction cost for armoring with RCC is \$2,253,100. The total cost would be \$2,814,000.

NATIONAL ECONOMIC DEVELOPMENT (NED) ALTERNATIVE

Detailed evaluation of the candidate plans to rehabilitate Huntsman 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 local sponsors in achieving the needs and purpose of this rehabilitation. Therefore, the federal assistance

alternative for rehabilitating the dam using 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 I 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 I summarizes the effects of each alternative considered. Refer to the Environmental Consequences section for additional information.

Table I - Summary and Comparison of Candidate Plans

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance, ACB Armor Recommended Plan – (NED Plan)
Sponsor Goals	Continue to provide flood protection, reduces liability	Continue to provide flood protection, reduces liability
Structural	Upgrade dam to meet dam safety criteria	Upgrade dam to meet dam safety criteria
Total Project Investment - Huntsman Lake	\$2,677,000	\$2,677,000
National Economic Development Account		
Total Beneficial Annualized (AAEs*)	---	\$110,000
Total Adverse Annualized (AAEs*)	---	\$110,000
Net Beneficial	---	\$0
Benefit/Cost Ratios	---	1.0 to 1.0
Estimated OM&R**	---	\$3,000
Environmental Quality Account		
WATER		
Regional water resources plans (including Coastal Zone Plans)	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.
Sewer utilities	No effect.	No effect.
Streams, Lakes, and Wetlands	Temporary effect during rehabilitation.	Temporary effect during rehabilitation.
Water quality	No long-term effect, minimal short-term effect.	No long-term effect, minimal short-term effect.
Water resources	Temporary loss of the 28.6 acre lake.	Temporary loss of the 28.6 acre lake.
AIR		
Air Quality	Temporary effect during rehabilitation.	Temporary effect during rehabilitation.
PLANTS		
Forest resources	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.
Invasive species	No effect.	No effect.
Natural areas	Remove 1.4 acres of trees. May move small understory plants.	Remove 1.4 acres of trees. May move small understory plants.
Riparian areas	Trees at inlet of auxiliary spillway will be removed.	Trees at inlet of auxiliary spillway will be removed.

Effects	Future Without Federal Project No Federal Action - Sponsors' Rehabilitation	Future With Federal Project Structural Rehabilitation with Federal Assistance, ACB Armor Recommended Plan – (NED Plan)
ANIMALS		
Essential fisheries	Sediment will be controlled to avoid effects on anadromous fish. Natural recovery of fishery.	Sediment will be controlled to avoid effects on anadromous fish. Natural recovery of fishery.
Fish and wildlife	Temporary loss of 28.6 acres of fish habitat. Permanent loss of 1.4 acres of upland forested habitat. Replant 2.5 acres of forested habitat.	Temporary loss of 28.6 acres of fish habitat. Permanent loss of 1.4 acres of upland forested habitat. Replant 2.5 acres of forested habitat.
Endangered and threatened Species	No federally threatened or endangered species present.	No federally threatened or endangered species present.
Migratory birds	Temporary effect on migratory birds species during construction.	Temporary effect on migratory birds species during construction.
HUMAN		
Construction access	Pedestrian access maintained to extent possible.	Pedestrian access maintained to extent possible.
Cultural resources	No effect.	No effect.
Environmental Justice and Civil Rights	No disparate treatment.	No disparate treatment.
Parklands	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.	Remove 1.4 acres of trees. Replant 2.5 acres for mitigation.
Public health and safety	Decrease potential for loss of life from dam breach.	Decrease potential for loss of life from dam breach.
Public recreation	Short-term effects only. Natural recovery of fishery.	Short-term effects only. Natural recovery of fishery.
Scenic beauty	Change from trees to grass in auxiliary spillway outlet.	Change from trees to grass in auxiliary spillway outlet.

* 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 \$110,000, 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 4.125% discount rate and a 77 year period of analysis.

** 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 Huntsman 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 meeting. Topics are listed in the same categories as listed in the Table I.

There are two plans that will be considered and evaluated in detail: 1) No Federal Action (Sponsors' Rehabilitation) and 2) Rehabilitate Dam with ACB Armor (NED Alternative). 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. For the purposes of this analysis, the least cost alternative (ACB Armoring) will be used as the Sponsors' Rehabilitation. The effects of the rehabilitation will be the same for all alternatives.

SOILS

There are no identified concerns with Land Use, Prime and Unique Farmlands and farmland of statewide significance, or Soil Resources.

WATER

There are no identified concerns with Floodplain Management, Sole source aquifers, or Wild and Scenic Rivers.

Regional water resource plans (including coastal zone plans)

Existing Conditions: Huntsman Lake is located in the Chesapeake Bay drainage area. As such, it is subject to the requirements of the Chesapeake Bay Preservation Act and the Virginia Coastal Zone Management Program.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the auxiliary spillway of Huntsman Lake will be done in accordance with all necessary requirements and restrictions. Fairfax County is responsible for assuring compliance and for obtaining any necessary permits and certificates. Approximately 2.5 acres of trees will be replanted in the watershed after construction to mitigate for the 1.4 acres of tree removal and the 1.1 acres of grass disturbance.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Sewer Utilities

Existing Condition: There is a concrete-encased sanitary sewer pipe that passes through the embankment of the dam on the left side. This pipe was installed before the dam was constructed. The pipe is not cased below the dam and the Sponsors do not want any excavation or fill over this pipe.

No Federal Action (Sponsors' Rehabilitation): There are no anticipated changes to the existing sewer pipe as a result of the planned rehabilitation activities. The alignment of the auxiliary spillway will be changed to avoid impacts.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Streams, Lakes, and Wetlands

Existing Conditions: The tributaries of Huntsman Lake have stable outlets, but are transporting some sediment into the lake. Despite the visible sediment deposition adjacent to the dam, there are no developed wetlands associated with these depositional areas. Approximately 0.4 acres of fringe wetlands were identified along the shoreline. The 28.6 acres of the lake are considered to be open water wetlands. Freshwater forested wetlands were found downstream of the outlet within the floodplain of Middle Run. Freshwater emergent wetlands were identified upstream of the inlet of the lake. Wetlands were identified within the floodplain of Middle Run upstream of the inlet area and downstream of the outlet.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will have no permanent adverse effect on Middle Run or its tributaries. The lake will be drained during rehabilitation. This will result in the temporary loss of 28.6 acres of surface water. The fringe wetlands around the lake will be dry during this time. There are no anticipated effects of the upstream or downstream freshwater forested wetlands.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Water Quality

Existing Conditions: Huntsman Lake and Middle Run are not listed as impaired in the 2008 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.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

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 have no permanent adverse effect on water resources. There will be a temporary impact to the 28.6 acre lake while it is drained for rehabilitation.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

AIR

Air Quality

Existing Conditions: Fairfax County lies within a non-attainment area for ozone and particulate matter-2.5 (PM_{2.5}) according to the 2009 Virginia Ambient Air Monitoring Data Report.

No Federal Action (Sponsors' Rehabilitation): During the rehabilitation of the dam, it will be necessary to utilize dust control practices. Other air quality practices will be installed, as needed.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

PLANTS

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

Forest Resources

Existing Conditions: Prior to the installation of the dam, the Sponsors zoned the 100-year floodplain of Middle Run to prevent development. This area is predominantly wooded upstream and downstream of Huntsman Lake.

No Federal Action (Sponsors' Rehabilitation): During the rehabilitation of the dam, 1.4 acres of trees will be permanently removed. Since there will be limited areas around the dam for replanting after rehabilitation, trees will be replanted within the watershed at the mitigation rate required by local regulations.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

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 Huntsman 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.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Natural Areas

Existing Conditions: There are no State Natural Area Preserves under the jurisdiction of the Virginia Department of Conservation and Recreation. However, the dam is located within Huntsman City Park which is managed by the Fairfax County Park Authority. The Park Authority has a person on staff who is responsible for coordination of activities involving native and/or invasive plants.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam would have a permanent adverse effect on 1.4 acres of trees due to the modifications to the auxiliary spillway. Small understory plants that will be affected may be moved to a site within the community under the supervision of the Park Authority staff, as needed.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Riparian Areas

Existing Conditions: The riparian areas around the lake and within the floodplain are forested with mature trees, understory, and herbaceous vegetation.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam will have no permanent adverse effect on the forest around the lake except for the small grove of trees that will be removed from the inlet of the auxiliary spillway as required by Virginia Division of Dam Safety. About 1.4 acres of trees will be permanently removed due to rehabilitation of the auxiliary spillway. An additional 1.1 acres within the RPA will be disturbed. A total of 2.5 acres of trees will be planted for mitigation. Some trees will be planted onsite. The remainder will be planted elsewhere in the watershed.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

ANIMALS

There are no identified concerns with Coral Reefs or Invasive Animal Species. The Fairfax County Park Authority initially had concerns about the potential for effects on Ecologically Critical Areas but, upon further investigation, did not identify any areas of concern.

Essential Fisheries

Existing Conditions: River herring are anadromous fish that are in Pohick Creek only during the spring spawning season. Although Huntsman Lake is not stocked, it has an established freshwater fish community.

No Federal Action (Sponsors' Rehabilitation): Sedimentation from construction activities will be controlled in accordance with all applicable regulations in order to minimize the adverse impacts on spawning. When the lake is drained, the majority of the fish will be carried downstream. According to the Virginia Department of Game and Inland Fisheries staff biologist, the fishery should recover naturally three to four years after the lake is refilled.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Fish and Wildlife

Existing Conditions: The lake provide habitat for a number of warm water fish species such as large and smallmouth bass, bluegills, sunfish, catfish, and a number of species of forage fish

including shiners, minnows, and dace. The terrestrial species, wading birds and shore birds in the watershed are well-adapted to the fragmented environment around the dam.

No Federal Action (Sponsors' Rehabilitation): Rehabilitation of the dam would result in no permanent changes in fish and wildlife habitat around the lake. Although the lake will be drained during rehabilitation, the aquatic and terrestrial species are expected to recover within three to four years. Terrestrial habitats in the auxiliary spillway will be altered by the removal of 1.4 acres of upland forested habitat. Trees will be replanted elsewhere in the watershed to mitigate for the loss onsite.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Endangered and Threatened Species

Existing Conditions: There are seven State Threatened (ST) and one State Endangered (SE) animal species likely to occur within a two mile radius of the Huntsman Lake dam site. There are no confirmed sightings of these species. There are no federally listed threatened or endangered species within this project.

No Federal Action (Sponsors' Rehabilitation): It is unlikely that rehabilitation of the dam would affect any of the state-listed threatened or endangered species or their habitat. There are no federally listed threatened or endangered species within this project.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Migratory Birds

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

No Federal Action (Sponsors' Rehabilitation): There will be temporary effects on some migratory bird species while the 28.6 acre lake is drained. There are multiple ponds and lakes in the immediate vicinity of Huntsman Lake that can be utilized during the construction period.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

HUMAN

There are no identified concerns with, Local and Regional Economy, Potable Water Supply, Scientific Resources, or Social Issues.

Construction Access

Existing Conditions: Access to the lake is through a residential area. Residents have expressed concerns about the effects of construction traffic on street parking and the potential difficulties with pedestrian access to the lake.

No Federal Action (Sponsors' Rehabilitation): Construction traffic will be limited to daytime hours. The Sponsors will work with the contractor to maintain pedestrian access to the lake if it can be done safely.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Cultural Resources

Existing Conditions: A field reconnaissance was conducted in February 2007 of the area below the dam downstream for approximately 200 meters. The ground surface and creek bed were searched for quartz and other natural material that could be used for the manufacture of stone tools. None were found. No previously recorded archaeological sites are present within the surveyed area. A Phase I archeological investigation was completed in December 2007 with the recommendations that the area of potential effect is not eligible for the NRHP and no further work is required. VDHR has concurred with these findings.

No Federal Action (Sponsors' Rehabilitation): Same as Existing Conditions.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Environmental Justice and Civil Rights

Existing Conditions: There is a diverse population within the watershed.

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. Avoiding a dam breach will directly benefit all residents within the watershed and taxpayers in general within Fairfax 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 550 people would benefit directly from the rehabilitation of the dam. These include residents in the breach zone, residents of the houses and townhomes immediately around the lake, and the estimated 400 people who use the area around the lake for recreation daily. There would be offsite benefits to about 13,800 people who would be affected by a breach event. This is primarily those people affected by impacts to the roads and includes those people who would lose access to emergency services or would be cut off from their residences or jobs.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Parklands

Existing Conditions: Huntsman Park is adjacent to the south side of the lake and extends along the floodplain downstream of the dam. All of this land is forested with plants and trees commonly found throughout the region. There is a walking trail across the top of the Huntsman Lake dam which is used heavily by the public.

No Federal Action (Sponsors' Rehabilitation): The impacts to the park will be limited to the construction area. The footprint of the disturbed area is estimated to cover 3.4 acres, of which 1.4 acres are wooded and two acres are in grass. The grass removed during construction will be replanted upon completion. Approximately 2.5 acres of trees will be planted for mitigation. Any trees that are presently located within 25 feet of the dam will be removed in accordance with Virginia Division of Dam Safety Regulations and the area will be planted to grass.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Public Health and Safety

Existing Conditions: The soil material in the existing earth auxiliary spillway does not have the strength 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 400 acre-feet. Thornecliff Road, Hooes Road, and Gambrill Road and all the associated utilities will be damaged. There is the potential for loss of life in the event of a dam breach.

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 75 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.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Public Recreation

Existing Condition: Huntsman Lake provides opportunities for lake-based activities such as canoeing and fishing, jogging, walking, and environmental education. Bird watching is a popular activity.

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 near the dam. The trail over the dam will be moved temporarily and will remain open to the extent possible.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Scenic Beauty

Existing Condition: At the present time, the auxiliary spillway and training dikes are in grass. The area immediately downstream of the dam is completely 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. Some of the 1.4 acres of trees that will be removed during construction will be replanted onsite and the remainder will be replanted within the watershed.

Rehabilitate Dam with ACB Armor (NED Alternative): Same as the No Federal Action (Sponsors' Rehabilitation).

Cumulative Effects

NRCS has constructed six flood control dams in this watershed. Lake Braddock was rehabilitated by Fairfax County prior to requesting federal assistance for dam rehabilitation. Three other dams within the watershed were evaluated by NRCS staff for rehabilitation. The Royal Lake, Woodglen Lake, and Barton Lake dams have been rehabilitated. The No Federal Action alternative for Huntsman Lake calls for the Sponsors to rehabilitate the dam. 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 Huntsman 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 77-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.

Property rights were procured to the crest of the auxiliary spillway prior to the original construction. This meets NRCS policy. No additional development is anticipated in the upstream watershed.

The Lakewood Hills #1 Community Association and the Fairfax County Park Authority own the properties affected by the proposed spillway rehabilitation and site access. Legal easements to construct the project will be obtained by Fairfax County.

No changes in wetlands or water quality are anticipated due to this project.

The sediment rate projected for the life of the project is based on the current “built-out” conditions in the watershed. An increase in construction activity could increase the amount of erosion in the watershed and sediment delivered to the lake. Also, further development in the watershed could increase runoff rates which would increase streambank erosion and sediment delivery to the lake.

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 75 years after construction. Statistically, there is a 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 the PMF occurs, and the flows through the auxiliary spillway remove the soil over the ACB armor, the estimated repair cost would be \$102,600 and would take approximately one month. This would include 5,200 SY of topsoil and seed. The estimates do not include any costs for offsite damages incurred during this catastrophic event. Lesser events will have smaller costs. Routine maintenance is not included in these amounts.

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 is to realign the auxiliary spillway and armor it with ACBs and replace the principal spillway riser. 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 36 people that live in the 12 single family homes and one townhome within the breach inundation zone.
- Provides protection for more than 10,600 vehicles on a daily basis that utilize Thornecliff Lane (2,200 vehicles), Hooes Road (no data), and Gambrill Road (8,400 vehicles).
- Provides onsite benefits to approximately 550 people and offsite benefits to an additional 13,800 people.
- Provides protection for four utilities (sewer, water, electricity, and gas).
- Minimizes the threat of loss of emergency service for about 94 residences 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 75 years.
- Eliminates the liability associated with continuing to operate an unsafe dam.
- Traps 1.5 acre feet of sediment annually, thereby improving downstream water quality.
- Maintains existing stream habitat downstream of the dam.
- Retains the existing fish and wildlife 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.

CONSULTATION AND PUBLIC PARTICIPATION

The sponsoring organizations are the Northern Virginia Soil and Water Conservation District and the Fairfax County Board of Supervisors. Fairfax County has been responsible for the operation and maintenance of the Huntsman Lake Dam since it was built. Interest and support for rehabilitating the dam began in 2001 when a study completed by a private engineering firm identified some potential problems with the soils in the auxiliary spillway. This was followed in May 2003 with the first issuance of a Conditional Certificate by the Virginia Division of Dam Safety. Following the passage of Public Law 106-472 in November of 2000, federal funds became available to eligible applicants. NRCS received an application for dam rehabilitation assistance in August 2003.

Local, state and federal support for the rehabilitation of the Huntsman 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 Northern Virginia SWCD and Fairfax 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 NRCS National Water Management Center Staff from Little Rock, Arkansas, toured the Pohick Creek Watershed on October 18, 2005, and provided input and support to the ongoing planning efforts. A follow-up teleconference was held with NRCS and Sponsors the next day. Feedback was provided regarding the federal dam rehabilitation program and the completion of supplemental plans and environmental assessments for the rehabilitation of the dams within the Pohick Creek watershed.

A local Task Force group was established to provide input on issues that would be of concern to the community. The first meeting was held on June 16, 2010.

The first public meeting for Huntsman Lake was held at the Springfield District Office, Springfield, Virginia on September 8, 2010. Local, state and federal perspectives on the rehabilitation needs of the Huntsman 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. This fact sheet was also posted on the Fairfax County website to provide the public greater access to this information.

A scoping meeting was held on December 9, 2010, at the Springfield District Office 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.

The second Task Force meeting was held on April 4, 2011, at the Springfield District Office. The group concurred with the selection of the preferred alternative.

A second public meeting was held on April 25, 2011, at the Springfield District Office. 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 34 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 10, 2011. 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 45-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

SUMMARY AND PURPOSE

This supplemental plan documents the planning process by which the NRCS provided technical assistance to local Sponsors and the public in addressing resource issues and concerns relative to the rehabilitation of Huntsman Lake.

The recommended plan is to rehabilitate the dam by replacing the principal spillway riser and realigning the auxiliary spillway and armoring it with ACBs. By doing this, the present level of flood protection is maintained, property values are protected, and the threat to loss of life is reduced. The recommended plan of action for the dam is outlined below:

- Armor the control section, outlet section, and training dikes with ACBs, topsoil, and vegetation.
- Extend the existing training dikes to the valley floor to protect the dam embankment and to contain the auxiliary spillway flows.
- Change the alignment of the auxiliary spillway to move it away from residences and to protect the sanitary sewer.
- Regrade the top of the dam for approximately 40 feet adjacent to the auxiliary spillway to raise it to the design elevation.
- Replace the principal spillway riser with a baffle top riser.

After the implementation of these planned works of improvement, Huntsman 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

Fairfax County is responsible for obtaining any needed landrights and/or easements associated with the rehabilitation project. Additional easements will be required on property owned by the Fairfax County Park Authority and Lakewood Hills #1 Community Association to extend the auxiliary spillway and training dikes. No additional landrights in the floodpool are required since there will be no change in elevation of the auxiliary spillway. However, the Sponsors acknowledge the potential risk and liability that may be incurred by not securing landrights to the top of the dam. There are no relocations planned as a result of the installation of the project measures.

MITIGATION

Under Fairfax County's Chesapeake Bay Preservation Ordinance, unavoidable tree loss for an allowed use in the Resource Protection Area (RPA) must be mitigated by establishing an equivalent buffer at a 1:1 ratio with specified densities of trees and shrubs. There will be 1.4 acres of tree loss. An additional 1.1 acres of disturbance will occur in the RPA due to construction activities. A total of 2.5 acres of mitigation is required. Due to site restrictions, only some trees will be replanted on-site after construction. The remaining trees required to meet the mitigation goals will be replanted within the watershed following completion of construction activities. This is included as a component of the recommended alternative. All needed Best Management Practices (BMPs) for erosion control and dust reduction will be applied.

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, a 404 permit from the Army Corps of Engineers, any needed 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, the work will be halted and the SHPO will be notified. Appropriate investigation procedures will be initiated.

Huntsman Lake lies entirely within the Resource Protection Area of Pohick Creek, and thus falls under the Coastal Zone Management Act regulations. Therefore, prior to beginning any construction activities, Fairfax County must determine the extent of construction activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Resources Management Program. Fairfax County must submit a consistency certification to the Virginia Department of Environmental Quality regarding their coordinated review and compliance with these regulations. 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 \$2,677,000. Of this amount, PL-106-472 funds will bear \$1,939,000 and nonfederal funds will bear \$738,000. 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 \$287,000. 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 2011 price base was used and amortized at 4.125 percent interest for the 77 year period of analysis (including a design and installation period of two years and an expected useful life of 75 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 Huntsman 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 Fairfax County 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.

Fairfax County will be responsible for the following:

- Secure all needed environmental permits, easements, and rights for installation, operation and maintenance of the rehabilitated structure.
- 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.
- Provide engineering services for the design, construction, and certification of the project.
- Provide local administrative and contract services necessary for installation of the project.
- 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 Fairfax County 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 Huntsman 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 77 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-106-472 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

Pohick Creek Dam No. 8, Virginia

(Dollars)²

Installation Cost Items	Estimated Costs		
Structural measures to rehabilitate floodwater retarding dam: Pohick Creek Dam No. 8:	PL-106-472 Funds ³	Other Funds	Total
	\$1,939,000	\$738,000	\$2,677,000
Total Project:	\$1,939,000	\$738,000	\$2,677,000

Price base: January, 2011

Table 2 - Estimated Cost Distribution – Structural Measures

Pohick Creek Dam No. 8, Virginia

(Dollars)

Installation Cost Items	Installation Cost: PL-106-472 Funds ⁴				Installation Cost: Other Funds ⁵						Total Project Cost ⁶
	Construction Costs	Engineering Technical Assistance Costs	Project Administration Costs	Total PL-106-472 Cost	Construction Costs	Engineering Costs	Real Property Land Rights	Permits	Project Administration Costs	Total Other Funds	
Pohick Creek Dam No. 8	\$1,829,000	\$100,000	\$10,000	\$1,939,000	\$287,000	\$360,000	\$10,000	\$1,000	\$80,000	\$738,000	\$2,677,000
Totals:	\$1,829,000	\$100,000	\$10,000	\$1,939,000	\$287,000	\$360,000	\$10,000	\$1,000	\$80,000	\$738,000	\$2,677,000

Price base: January, 2011.

² All tables have a price base of 2011.³ Paid by the USDA/NRCS – the Federal agency responsible for assisting in installation of improvements.⁴ 65% of total 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, \$248,000 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 project cost that excludes federal technical assistance costs, water, mineral and other resource rights, and all federal, state and local permits, i.e., only the design and construction costs are included. 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
Pohick Creek Dam No. 8, Virginia

ITEM	UNIT	AMOUNT
Hazard Class of Structure	-	High
Seismic Zone	-	1
Total Drainage Area	Sq. Mi.	2.32
Time of Concentration	Hours	0.97
Antecedent Moisture Condition II Runoff Curve Number	-	73
Elevation, Top of Dam	Feet, MSL	264.0
Elevation, Auxiliary Spillway Crest	Feet, MSL	253.9
Elevation, Principal Spillway Orifice Crest	Feet, MSL	241.1
Auxiliary Spillway Type	-	Structural ¹
Auxiliary Spillway Bottom Width	Feet	75
Auxiliary Spillway Exit Slope	%	10
Maximum Height of Dam	Feet	41.5
Volume of Fill (Rehabilitation)	Cu. Yd.	14,000
Total Capacity	Ac.-Ft.	678
Sediment Submerged ²	Ac.-Ft	134
Sediment Aerated ²	Ac.-Ft	7
Floodwater Retarding Pool	Ac.-Ft.	537
Surface Area		
Sediment Pool	Acres	28.6
Floodwater Retarding Pool	Acres	60
Principal Spillway Design		
Rainfall Volume (1 day)	Inches	8.34
Rainfall Volume (10 day)	Inches	12.20
Runoff Volume (10 day)	Inches	6.11
Capacity at Crest of Auxiliary Spillway	CFS	109
Conduit Size	Inches	30
Conduit Type	-	Concrete
Frequency of Operation, Auxiliary Spillway	Annual % chance	1
Auxiliary Spillway Hydrograph		
Rainfall Volume	Inches	15.53
Runoff Volume	Inches	11.83
Storm Duration	Hours	6
Velocity of flow (V _e)	Ft/s	12.6
Maximum Surface Elevation	Feet, MSL	258.0
Freeboard Hydrograph (6-hr PMP)		
Rainfall Volume	Inches	27.6
Runoff Volume	Inches	23.6
Storm Duration	Hours	6
Maximum Surface Elevation	Feet, MSL	263.8
Capacity Equivalents		
Sediment	Inches	1.14
Floodwater Retarding	Inches	4.34

¹ ACB Block System

² Based on the 2008 sediment survey

Table 4 - Average Annual National Economic Development (NED) Costs
Pohick Creek Dam No. 8, Virginia
(Dollars)

	Average Annual Equivalent Cost	Annual Operation and Maintenance Costs	Total Average Annual Equivalent Cost
Rehabilitation of Pohick Creek Dam No. 2	\$107,000	\$3,000	\$110,000
Totals:	\$107,000	\$3,000	\$110,000

Price base: January, 2011

Note: The average annual equivalents are based on a 4.125% discount rate and a 77 year period of analysis (2 years for project design/installation and 75 years of expected useful life).

Table 5 - Estimated Average Annual Flood Damage Reduction Benefits
Pohick Creek Dam No. 8, Virginia
(Dollars)

Flood Damage Category	Estimated Average Annual Equivalent Damages		Damage Reduction Benefits
	Without Federal Project	With Federal Project	Average Annual Equivalents
Structure Damages:	\$300	\$300	\$0
Content Damages:	\$220	\$220	\$0
Private Clean-up Costs:	\$0	\$0	\$0
Public Clean-up Costs:	\$0	\$0	\$0
Private Business Income Losses:	\$120	\$120	\$0
Vehicle and Traffic and Costs:	\$10	\$10	\$0
Infrastructure Damages:	\$3,780	\$3,780	\$0
Public Admin. Costs:	\$0	\$0	\$0
Totals (rounded):	\$4,430	\$4,430	\$0

Price base: January 2011

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 \$117,700.

Table 6 - Comparison of National Economic Development (NED) Benefits and Costs
Pohick Creek Dam No. 8, 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				
Pohick Creek Dam No. 2	\$0	\$110,000	\$110,000	\$110,000	\$0	1.0 to 1.0
Totals:	\$0	\$110,000	\$110,000	\$110,000	\$0	1.0 to 1.0

Price base: January, 2011

Note: The average annual equivalents are based on a 4.125% discount rate and a 77 year period of analysis (2 year for project design/installation and 75 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 Pohick Creek Watershed Supplemental Plan and Environmental Assessment was prepared primarily by the NRCS Planning Team located in Richmond, 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

<u>Name</u>	<u>Present Title and Years in Current Position</u>	<u>Education</u>	<u>Previous Experience</u>	<u>Other</u>
David L. Faulkner	Natural Resource Economist – 22	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 – 18	B.S. Geology	GIS/Soil Scientist - 7 yrs. Soil Cons. Tech. - 7 yrs. Geologist (Private) – 4 yrs.	
Jeffrey Jones	Watersheds Program Coordinator – 1	B.S. Natural Resources Management	Ecologist - 15 yrs.	
Alica J. Ketchum	Environmental Engineer - 17	B.S. Civil Engineering M.S. Agricultural Eng.	Civil Engineer – 10 yrs.	P.E.
Brian Linvill	Design Engineer - 3	B.S. & M.S. Agricultural Engineering	Hydraulic Engineer – 10 yrs.	
Mathew J. Lyons	State Conservation Engineer- 10	B.S. Civil Engineering	Civil Engineer – 12 yrs.	PE
Jeffrey D. McClure	Geologist – 7	B.A. Geology B.A. Biology B.S. Geology	NRCS Geologist – total 4 yrs. Geologist (WV Dept. of Env. Prot.) - 11 yrs. Geologist (Private) – 8.5 yrs.	CPG in KY, VA, DE and PA

<u>Name</u>	<u>Present Title and Years in Current Position</u>	<u>Education</u>	<u>Previous Experience</u>	<u>Other</u>
Kelly Ramsey	Hydraulic Engineer - 6	B.S. Biological Systems Engineering	Civil Engineer – 12 years	P.E.
Gerald Wright	Project Engineer – 5	B.S. Civil Engineering	Civil Engineer – 20 yrs.	PE, PLS

EMPLOYEES FROM SCHNABEL ENGINEERING NORTH, LLC, UNDER CONTRACT TO FAIRFAX COUNTY

<u>Name</u>	<u>Present Title and Years in Current Position</u>	<u>Education</u>	<u>Previous Experience</u>	<u>Other</u>
W. Kortney Brown	Civil Engineer - 3	B.S. Civil Engineering		EIT
Melinda Dirdal	Civil Engineer – 5	B.S. Civil Engineering		EIT
Jay T. Halligan	GIS Specialist - 5	B.A. Geographical Analysis		
William Irwin	Civil Engineer – 2	B.S. Civil Engineering M.S. Civil Engineering	NRCS Civil Engineer – 34 yrs.	PE
Matthew J. Marchisello	Civil Engineer - 5	B.S. Civil Engineering M.S. Civil Engineering		PE
Gregory S. Paxton	Civil Engineer – 15	B.S. Civil Engineering M.S. Civil Engineering		PE
Paul I. Welle	Hydraulic Engineer – 11	B.S. Agricultural Engineering	NRCS Civil Engineer – 4 yrs. NRCS Hydraulic Engineer – 26 yrs.	PE

Special acknowledgment goes to the following people who spent many hours in the Pohick Creek Watershed surveying, collecting data, meeting with landowners, and attending public meetings, or providing technical support.

- Fairfax County Staff: Dipmani Kumar.
- Northern Virginia Soil and Water Conservation District: Diane Hoffman, Robert Kohnke, and John Peterson

DISTRIBUTION LIST

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

<u>Federal Agencies</u>	<u>Response Received on Draft Supplemental Plan/EA</u>
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	Yes
Federal Emergency Management Agency Philadelphia	No
U.S. Department of Agriculture Forest Service	No
Farm Service Agency	No
Rural Development	No
<u>Virginia State Agencies</u>	
Virginia Department of Environmental Quality Office of Environmental Impact Review (State Clearinghouse)	Yes
Division of Land Protection and Revitalization	Yes
Division of Air	Yes
Northern Regional Office	Yes
Virginia Department of Emergency Management	No
Virginia Department of Conservation and Recreation Division of Soil and Water Conservation	Yes
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	Yes
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
Northern Virginia Soil and Water Conservation District	No
Fairfax County	
Department of Public Works and Environmental Services	
Stormwater Planning Division	Yes
Park Authority	Yes
Department of Planning and Zoning	No
Northern Virginia Regional Commission	Yes

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APPENDIX A

COMMENT AND RESPONSES



COMMONWEALTH of VIRGINIA

Douglas W. Domenech
Secretary of Natural Resources

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

Kathleen S. Kilpatrick
Director

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July 14, 2011

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. 8 of the Pohick Creek Watershed, Fairfax County, Virginia*
DHR File No. 2005-1529

Dear Mr. Bricker:

We have received the above-referenced document for review. The Huntsman Lake Dam rehabilitation area was previously subjected to an archaeological survey by URS Corporation. The resulting report, entitled *Phase I Archaeological Evaluation of Dam Rehabilitation Sites at Lake Barton (Pohick 2), Woodglenn Lake (Pohick 3), Lake Huntsman (Pohick 8), and Lake Laura (Stony Creek 9), Fairfax and Shenandoah Counties, Virginia* was accepted by our office on April 15, 2008 (see Appendix A to the EA). Survey of the Huntsman Lake Dam project area identified no archaeological sites and no further archaeological study was recommended.

We find that the draft Environmental Assessment accurately details the consultation to date. We concur with your finding of *no historic properties affected*. 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, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

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United States Department of Agriculture



Natural Resources Conservation Service
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Telephone: 804/287-1691
Fax: 804/287-1737

July 21, 2011

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 Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Mr. Kirchen:

We appreciate 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, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,

A handwritten signature in black ink that reads "W. Ray Dault" or similar, written over the printed name of John A. Bricker.

Acting For JOHN A. BRICKER
State Conservationist

Helping People Help the Land
An Equal Opportunity Provider and Employer

From: Tylan_Dean@fws.gov [mailto:Tylan_Dean@fws.gov]
Sent: Thursday, July 14, 2011 09:36 PM
To: Bricker, Jack - Richmond, VA
Cc: William_Hester@fws.gov <William_Hester@fws.gov>
Subject: Huntsman Lake Supplemental Watershed plan#6 and EA

We have reviewed the referenced project description. The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended.

Based on the project description and location, it appears that no impacts to federally listed species or designated critical habitat will occur, and we have no further comment. Should project plans change or if additional information on the distribution of listed species or critical habitat becomes available, this determination may be reconsidered.

If you have questions, please contact William Hester of this office at (804) 693-6694, extension 127, or via email at William_Hester@fws.gov.

Tylan Dean
Assistant Supervisor
Endangered Species & Conservation Planning Assistance
U.S. Fish and Wildlife Service
Virginia Field Office
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Gloucester, Virginia 23061
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United States Department of Agriculture



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

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

July 21, 2011

Tylan Dean, Assistant Supervisor
Endangered Species and Conservation Planning Assistance
U. S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the
Rehabilitation of Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Mr. Dean:

We appreciate 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 impacts to federally listed species or designated critical habitat.

If questions or concerns arise as the project proceeds, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,

A handwritten signature in black ink that reads "W. Ray Durr" or similar, written over the printed name of John A. Bricker.

Acting For JOHN A. BRICKER
State Conservationist

Helping People Help the Land

An Equal Opportunity Provider and Employer

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 8, 2011

John Bricker
Natural Resources Conservation Service
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229

Re: Rehabilitation of Floodwater Retarding Structure #8 of the Pohick Creek Watershed

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.

According to the information currently in our files, natural heritage resources have not been documented in the project area. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

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.

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 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 804-692-0984. Thank you for the opportunity to comment on this project.

*State Parks • Soil and Water Conservation • Natural Heritage • Outdoor Recreation Planning
Chesapeake Bay Local Assistance • Dam Safety and Floodplain Management • Land Conservation*

Sincerely,

A handwritten signature in black ink that reads "Alli Baird". The script is cursive and fluid, with the first letters of each name being capitalized and prominent.

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

United States Department of Agriculture



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

Telephone: 804/287-1681
Fax: 804/287-1737

July 21, 2011

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison
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 Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Ms. Baird:

We appreciate 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, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,


Acting For JOHN A. BRICKER
State Conservationist

Helping People Help the Land
An Equal Opportunity Provider and Employer



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

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

July 14, 2011

Mr. John A. Bricker
Natural Resources Conservation Service
U.S. Department of Agriculture
1606 Santa Rosa Road, Suite 209
Richmond, Virginia 23229

RE: Draft Supplemental Watershed Plan No. 6 and Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed, Fairfax County, (DEQ 11-114F).

Dear Mr. Bricker:

The Commonwealth of Virginia has completed its review of the June 2011 Draft Supplemental Watershed Plan (SWP) No. 6 and Environmental Assessment (EA) (received June 14, 2011) for the above referenced project. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of federal consistency documents submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. The following agencies, locality, and planning district commission participated in the review of this proposal:

Department of Environmental Quality
Department of Game and Inland Fisheries
Virginia Marine Resources Commission
Department of Conservation and Recreation
Department of Health
Department of Historic Resources
Fairfax County
Northern Virginia Regional Commission

PROJECT DESCRIPTION

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) is providing federal funding to Fairfax County and the Northern Virginia Soil

Rehabilitation of Floodwater Retarding Structure No. 8
Pohick Creek Watershed

and Water Conservation District (project sponsors) for the proposed rehabilitation of floodwater retarding structure (dam) No. 8 at Huntsman Lake in the Pohick Creek watershed in Fairfax County. Dam No. 8 does not presently meet NRCS or Virginia safety standards for the stability and integrity of the auxiliary spillway. The recommended plan will rehabilitate the Huntsman Lake dam to meet current safety and design criteria. The plan provides for realigning the auxiliary spillway and armoring it with articulated concrete blocks from the control section of the auxiliary spillway to the valley floor. The training dikes will be extended to the valley floor. Approximately 40 feet of the dam embankment will be raised by 0.6 feet. The existing open top principal spillway riser will be replaced by a baffle type riser. There will be no change in the current levels of flood protection downstream as a result of project activity.

CONCLUSION

Provided activities are performed in accordance with the recommendations which follow in the Impacts and Mitigation section of this report, this proposal is unlikely to have significant effects on ambient air quality, important farmland, forest resources, and wetlands. It is unlikely to adversely affect species of plants or insects listed by state agencies as rare, threatened, or endangered.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Water Quality and Wetlands. According to the SWP/EA (page 11), Huntsman Lake is located on Middle Run which confluent with Pohick Creek, which then flows into the Potomac River at Pohick Bay. 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.

The document (page 41) states that the Huntsman Lake shoreline, inlet, and outlet were visually surveyed in October 2010 for wetlands. Approximately 0.4 acres of fringe wetlands were identified along the shoreline. The lake will be drained during rehabilitation. This will result in the temporary loss of 28.6 acres of surface water. The fringe wetlands around the lake will be dry during this time. There are no anticipated effects of the upstream or downstream freshwater forested wetlands.

1(a) Agency Jurisdiction. The State Water Control Board (SWCB) promulgates Virginia's water regulations, covering a variety of permits to include Virginia Pollutant Discharge Elimination System Permit, Virginia Pollution Abatement Permit, Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection Permit (VWPP). The VWPP is a state permit which governs wetlands, surface water, and surface water withdrawals/impoundments. It also serves as § 401 certification of the federal *Clean Water Act* § 404 permits for dredge and fill activities in waters of the U.S. The VWPP Program is under the Office of Wetlands and Water Protection/Compliance, within the DEQ Division of Water Quality Programs. In addition to central office staff that 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 Findings. DEQ-NRO states that the project document adequately addresses issues related to programs that are overseen by DEQ-NRO.

1(c) Recommendations. 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 trench 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, 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.

2. Subaqueous Lands Impacts. The SWP/EA does not address potential project impacts to state subaqueous lands.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission (VMRC), pursuant to Section 28.2-1200 *et seq.* of the *Code of Virginia*, has jurisdiction over any encroachments in, on, or over any state-owned rivers, streams, or creeks in the Commonwealth.

The VMRC serves as the clearinghouse for the JPA used by the:

- U.S. Army Corps of Engineers (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 Virginia Water Protection Permit;
- VMRC for encroachments on or over state-owned subaqueous beds as well as tidal wetlands; and
- local wetlands board for impacts to wetlands.

Jurisdictional impacts are reviewed by the appropriate agency under the JPA process.

2(b) Agency Findings. According to the VMRC, the agency will not assume jurisdiction over the submerged lands of Pohick Creek since the drainage area at the project site is less than five square miles (2.32 square miles).

For additional information, contact VMRC, Tony Watkinson at (757) 247-2256.

3. Erosion and Sediment Control and Stormwater Management. According to the SWP/EA (page 41), the 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.

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

3(b) Erosion and Sediment Control and Stormwater Management Plans. According to DCR-DSWC, the project sponsors and their authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with the *VESCL&R*, *VSWML&R* (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 and federal consistency under the *Coastal Zone Management Act*). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, or other structures, soil or dredge spoil areas, or related land conversion activities that disturb equal to or greater than 2,500 square feet in designated Chesapeake Bay Preservation Areas

Areas (CBPAs) would be regulated by *VESCL&R* and *VSWML&R*. Accordingly, the project sponsors must prepare and implement erosion and sediment control (ESC) and stormwater management (SWM) plans 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 project sponsors are 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].

3(c) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities. DCR is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The operator or owner of a construction project involving land-disturbing activities equal to or greater than 2,500 square feet in areas designated as subject to the *Chesapeake Bay Preservation Area Designation and Management Regulations* 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 the SWPPP must address water quality and quantity in accordance with the 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_&_water/vsmp.shtml. [Reference: *Virginia Stormwater Management Act* §10.1-603.1 *et seq.*; *VSMP Permit Regulations* 4 VAC-50 *et seq.*]

4. Chesapeake Bay Preservation Areas. According to the SWP/EA (page 12), dam rehabilitation efforts must consider impacts as required by the *Chesapeake Bay Preservation Act*. Fairfax County has adopted local land use plans and ordinances which incorporate water quality protection measures consistent with the *Chesapeake Bay Preservation Area Designation and Management Regulations*. The *Regulations* address non-point source pollution by identifying and protecting those lands that have the potential to impact water quality most directly. The watershed of Huntsman Lake is in a Resource Management Area, and the area immediately adjacent to Middle Run and its tributaries, including Huntsman Lake, is in a Resource Protection Area.

4(a) Agency Jurisdiction. DCR's Division of Stormwater Management (DSM), Local Implementation (LI) (previously called the Division of Chesapeake Bay Local Assistance) administers the *Chesapeake Bay Preservation Act (Bay Act)* (*Virginia Code* §10.1-2100-10.1-2114) and *Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations)* (9 VAC 10-20 *et seq.*).

4(b) Agency Comments. DCR-DSM-LI concurs with the project document that the project sponsors must comply with the applicable requirements of the *Regulations*.

4(c) Chesapeake Bay Preservation Areas. According to information provided by DCR-DSM-LI for previous projects, the *Bay Act*, as locally implemented through the Fairfax County Chesapeake Bay Preservation Ordinance, strictly controls land disturbance in environmentally sensitive lands. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include:

- tidal wetlands;
- certain non-tidal wetlands;
- tidal shores; and
- a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow.

RMAs are subject to the county's jurisdiction-wide performance criteria for development activities.

4(d) Requirements. The project sponsor must comply with the applicable requirements of the *Regulations* as summarized below. The project sponsors must coordinate this project with DCR-DSM-LI prior to construction to ensure compliance with the *Regulations*.

(i) RPA Delineation

Pursuant to 9 VAC 10-20-105 of the *Regulations*, an on-site delineation of the RPA is required for all projects in CBPAs. Because U.S. Geological Survey maps are not always indicative of site conditions, they may not be used to determine the site-specific boundaries of the RPA. The applicant should be aware that on-site delineation of the RPA and/or RMA may necessitate the undertaking of a perennial flow determination.

(ii) Development in RPA

Development within an RPA is subject to the development criteria of 9 VAC 10-20-120 and 130 of the *Regulations* and the local ordinance. No land disturbance (to include clearing of vegetation) or development is to occur within RPAs unless specifically permitted by the *Regulations* and the local ordinance.

(iii) General Performance Criteria

Development on lands analogous to RPAs and RMAs are subject to general performance criteria found in 9 VAC 10-20-120 of the *Regulations*, including requirements to:

- minimize land disturbance (including access and staging areas);
- retain indigenous vegetation; and
- minimize post-development impervious surfaces.

For land disturbance over 2,500 square feet, the project must comply with:

- the requirements of the *Virginia Erosion & Sediment Control Handbook*, Third Edition, 1992; and
- stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations* (4 VAC 50-60-10) shall be satisfied.

5. Air Pollution Control. According to the SWP/EA (page 42), Fairfax County lies within a non-attainment area for ozone and particulate matter-2.5 (PM_{2.5}), as reported in the *2009 Virginia Ambient Air Monitoring Data Report*. The document states that during the rehabilitation of the dam, it will be necessary to utilize dust control practices, and other air quality practices will be installed, as needed.

5(a) Agency Jurisdiction. DEQ's Air Quality Division, on behalf of the State Air Pollution Control Board, is responsible to develop regulations that become *Virginia's Air Pollution Control Law*. DEQ is charged to carry 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 issue of necessary permits to construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents of new projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

5(b) Agency Findings. According to the DEQ Air Division, the project site is located in a designated ozone nonattainment area and emission control area for and oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Precursors to ozone (O₃) pollution include VOCs and NO_x.

5(c) Recommendation. The project sponsors should take all reasonable precautions to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels.

5(d) Requirements.

(i) Fugitive Dust

Fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 *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.

(ii) Open Burning

If project activities include the open burning or use of special incineration devices for the disposal of land clearing debris, this activity must meet the requirements of 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100 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. The project sponsors should contact Fairfax County officials to determine what local requirements, if any, exist.

6. Solid and Hazardous Wastes and Hazardous Management. The SWP/EA does not discuss solid and hazardous waste issues and management.

6(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by the Virginia Department of Environmental Quality, the Virginia Waste Management Board (VWMB) and the U.S. Environmental Protection Agency. They administer programs created by the federal *Resource Conservation and Recovery Act*, *Comprehensive Environmental Response Compensation and Liability Act*, commonly called Superfund, and the *Virginia Waste Management Act*. DEQ administers regulations established by the VWMB 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.

6(b) Agency Findings. DEQ's Division of Land Protection and Revitalization (DLPR) performed a geographic information system (GIS) database search and a cursory review of DEQ data files and determined that there are a number of hazardous waste, solid waste, Formerly Used Defense Sites (FUDS), voluntary remediation program

(VRP) sites and petroleum release sites located in the same zip code. However, their proximity to the project sites is unknown. These sites are included as an attachment to this response.

6(c) 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.

6(d) Recommendations.

(i) Formerly Used Defense Sites

DEQ-DLPR recommends that if the identified FUDS site is found to be in close proximity to the project site, then further information regarding the site is advised. For the location and further information regarding the above FUDS site, contact the DEQ Office of Remediation Programs (ORP), Federal Facilities Program Manager, Karen Sismour at (804) 698-4421.

(ii) Voluntary Remediation Program

DEQ's VRP case file should be evaluated by the project proponent to establish the exact location, the nature and extent of the identified VRP site in the same zip code as the project site (attached), and the potential of the release to impact the proposed project. The project proponent should contact the DEQ's VRP Program and/or DEQ-NRO for further information on the administrative records of the VRP case which may be in close proximity to the proposed project. VRP contacts may be found at <http://www.deq.virginia.gov/vrp/contactus.html>.

(iii) Petroleum Release Sites

Petroleum release sites within 0.50-mile of the project site (attached) should be evaluated by the project sponsors to establish the exact location of the petroleum release, the nature and extent of the release, and the potential to impact the proposed project. The project sponsors should contact DEQ-NRO, Richard Doucette at (703) 583-3813 for further information on the administrative records.

(iv) Pollution Prevention

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.

7. Pesticides and Herbicides. DEQ recommends that the use of herbicides or pesticides for construction or landscape maintenance should be in accordance with the

principles of integrated pest management. The least toxic pesticides that are effective in controlling the target species should be used. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information.

8. Natural Heritage Resources. The Virginia Department of Conservation and Recreation, Division of Natural Heritage was contacted regarding records of species and habitats occurring in the project footprint (SWP/EA, Appendix B).

8(a) Agency Jurisdiction The mission of the Virginia Department of Conservation and Recreation is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental programs organized within seven divisions including the Division of Natural Heritage. The Natural Heritage Program's (DCR-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).

8(b) Agency Findings.

(i) Natural Heritage Resources

DCR-DNH searched its Biotics Data System for occurrences of natural heritage resources at the alternative sites. DCR documents the presence of natural heritage resources in these project areas. However, due to the scope of the activity and the distance to the resources, DCR-DNH does not anticipate that this project will adversely impact these natural heritage resources.

(ii) State-listed Plant and Insect Species

The *Endangered Plant and Insect Species Act* of 1979, Chapter 39 §3.1-1020 through 1030 of the *Code of Virginia*, as amended, authorizes the Virginia Department of Agriculture and Consumer Services (VDACS) to conserve, protect, and manage endangered and threatened species of plants and insects. The VDACS Virginia Endangered Plant and Insect Species Program personnel cooperates with the USFWS, DCR-DNH and other agencies and organizations on the recovery, protection or conservation of listed threatened or endangered species and designated plant and insect species that are rare throughout their worldwide ranges. In those instances where recovery plans, developed by USFWS, are available, adherence to the order and tasks outlined in the plans are followed to the extent possible.

Under a Memorandum of Agreement established between VDACS and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. DCR finds that the current activity will not affect any documented state-listed threatened or endangered plants or insects.

(iii) State Natural Area Preserves

DCR files do not indicate the presence of any State Natural Area Preserves under the agency's jurisdiction in the project vicinity.

8(c) Recommendation. Contact DCR-DNH, Rene Hypes at (804) 371-2708 for an update on natural heritage information if a significant amount of time passes before the project is initiated since new and updated information is continually added to the Biotics Data System.

9. Wildlife Resources and Protected Species. According to the SWP/EA (page 44), there are seven state-listed threatened (ST) and one state-listed endangered (SE) animal species likely to occur within a two mile radius of the Huntsman Lake dam site. There are no confirmed sightings of these species. There are no federally-listed threatened or endangered species within this project. The document concludes that it is unlikely that rehabilitation of the dam would affect any of the state-listed threatened or endangered species or their habitat.

9(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (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). The 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.

9(b) Agency Findings. DGIF does not currently document any listed wildlife or resources under its jurisdiction from the project area. Therefore, DGIF does not anticipate this project to result in adverse impacts upon such species and resources.

9(c) Recommendations. DGIF recommends the following:

- conduct in-stream activities during low or no-flow conditions;
- use non-erodible cofferdams or turbidity curtains to isolate the construction area;
- block no more than 50% of the streamflow at any given time;
- stockpile excavated material in a manner that prevents reentry into the stream;
- restore original streambed and streambank contours;

Rehabilitation of Floodwater Retarding Structure No. 8
Pohick Creek Watershed

- revegetate barren areas with native vegetation; and
- implement strict erosion and sediment control measures.

In addition, DGIF recommends that the project sponsors coordinate with DGIF's Regional Aquatic Resources Biologists at (540) 899-4169, regarding the draining of Huntsman Lake and plans to refill and stock the lake.

Contact DGIF, Amy Ewing at (804) 367-2211 or Ernie Aschenbach at (804) 367-2733, for additional information regarding these comments.

10. Water Supply. According to the SWP/EA (page 11), the Pohick Creek watershed is not considered a public drinking water source or 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 and surface water intakes).

10(b) Agency Findings. VDH finds that there are no groundwater wells within a one mile radius of the project site and one surface water intakes within a five-mile radius. The Fairfax County Water Authority/Occoquan Reservoir intake is up-gradient of the project site.

The project site does not fall within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources. For public surface water intakes Zone 1 is the area included within a 5-mile radius around the surface water intake and Zone 2 is the entire up-gradient area of the watershed. For public groundwater wells Zone 1 is an area included within a 1,000-foot radius the well and Zone 2 is a radius of one mile.

10(c) Conclusion. VDH-ODW concludes that there are no apparent impacts to public drinking water resources as a result of the project.

10(d) Requirements. According to VDH, potential impacts to public water distribution systems must be verified by the local utility.

Contact VDH, Diedre Forsgren at (804) 864-7241 for additional information.

11. Historic Structures and Archaeological Resources. According to the SWP/EA (page 45), a field reconnaissance was conducted in February 2007 of the area below the dam downstream for approximately 200 meters. No previously recorded archaeological sites are present within the surveyed area. A Phase I archeological investigation was completed in December 2007 with the recommendations that the area of potential effect is not eligible for the National Register of Historic Places and no further work is required.

11(a) Agency Jurisdiction. The Department of Historic Resources (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 of 1962 (NHPA), as amended, and its implementing regulation at 36 CFR Part 800. The NHPA 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.

11(b) Agency Findings. According to DHR, NRCS has contacted the DHR directly pursuant to Section 106 NHPA, as amended, and its implementing regulation 36 CFR Part 800.

11(c) Conclusion. DHR will provide comments directly to the NRCS.

For additional information, contact DHR, Roger Kirchen at (804) 482-6091.

12. Local Review.

12(a) Agency Jurisdiction. In accordance with CFR 930, Subpart A, § 930.6(b) of the *Federal Consistency Regulations*, DEQ, on behalf of the state, is responsible for securing necessary review and comment from other state agencies, the public, regional government agencies, and local government agencies, in determining the Commonwealth's concurrence or objection to a federal consistency certification.

12(b) County Comments. Fairfax County has no comments on the SWP/EA. However, the Department of Public Works will be sending comments directly to the NRCS regarding the proposed work.

Questions regarding the county's comments may be directed to Fairfax County, John Bell at (703) 324-1278.

13. Regional Planning District.

13(a) Agency Comments. According to the Northern Virginia Regional Commission (NVRC), Arlington County, Fairfax County, Prince William County, City of Alexandria and Town of Herndon have enacted jurisdiction-wide Chesapeake Bay Resource Management Areas. The RMA designation requires that all development must comply with the local ordinance's stormwater quality requirements.

13(b) Recommendations. NVRC recommends that, where possible, opportunities to retrofit existing stormwater quantity facilities to stormwater quality facilities through new construction activities should be identified. NVRC's *Guidebook for Maintaining BMPs in*

Northern Virginia is available, through NVRC and may be downloaded from NVRC's website for more information.

For additional information, contact NVRC, Samantha Kinzer at (703) 642-4636.

14. Dam Safety. According to the SWP/EA (page 27), alternative rehabilitation plans that are considered in the SWP/EA were coordinated with the DCR-Virginia Division of Dam Safety.

14(a) Agency Jurisdiction. DCR's Division of Dam Safety (DDS) is charged with: providing for proper and safe design, construction, operation and maintenance of dams to protect public safety. DCR-DDS' authority is from 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 (Dam Safety Regulations)*, established and published by the Virginia Soil and Water Conservation Board (VSWCB)

14(b) Agency Comments. DCR-DDS has reviewed the proposed action and has no issues regarding the plan.

For additional information, contact DCR-DSS, Robert Bennett at (804) 786-3914.

REGULATORY AND COORDINATION NEEDS

1. Water Quality and Wetlands. Any surface water and wetland impacts associated with this proposal may require a Virginia Water Protection Permit issued by the DEQ Northern Regional Office pursuant to Virginia Code §62.1-44.15:5 For additional information and coordination, contact DEQ-NRO, Trisha Beasley at (703) 583-3940.

2. Erosion and Sediment Control and Stormwater Management.

2(a) Erosion and Sediment Control and Stormwater Management. The project sponsors must ensure the project is conducted in compliance with *Virginia's Erosion and Sediment Control Law (Virginia Code 10.1-567)* and *Regulations (4 VAC 50-30-30 et seq.)* and *Stormwater Management Law (Virginia Code 10.1-603.5)* and *Regulations (4 VAC 3-20-210 et seq.)*. An erosion and sediment control plan may be submitted to the DCR Warrenton Regional Office at (540) 347-6420 for review and approval.

2(b) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities. For projects involving land-disturbing activities equal to or greater than 2,500 square feet Chesapeake Bay Preservation Areas, the project sponsors are required to apply for registration coverage under the Virginia Stormwater Management Program General Permit for Discharges of Stormwater from Construction Activities. Specific questions regarding the Stormwater Management Program requirements should be directed to DCR, Holly Sepety at (804) 225-2613.

3. Chesapeake Bay Preservation Areas. This project must comply with the applicable regulatory requirements of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (9 VAC 10-20 *et seq.*). Project activities within a Resource Protection Area are subject to the development criteria of 9 VAC 10-20-120 and 130 of the *Regulations*. Land-disturbing activities within a Resource Management Area are subject to the general performance criteria found in the *Regulations* at 9 VAC 10-20-120 *et seq.* The *Regulations* can be accessed online at http://www.dcr.virginia.gov/stormwater_management/theregs.shtml. Coordination of this project with DCR-DSM-LI may be accomplished by contacting V'lent Lassiter at (804) 371-7500.

4. Air Quality Regulations. This project is subject to air regulations administered by the Department of Environmental Quality. The following sections of the Code of Virginia and Virginia Administrative Code are applicable:

- 9 VAC 5-50-60 *et seq.* governing fugitive dust emissions; and
- 9 VAC 5-130 *et seq.*, for open burning.

For more information and coordination contact DEQ-NRO, Terry Darton at (703) 583-3845. Also, contact local Fairfax County officials for information on any local requirements pertaining to open burning.

5. 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 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 20-80); and
- *Virginia Regulations for the Transportation of Hazardous Materials* (9VAC 20-110).

Some of the applicable federal laws and regulations are:

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

For additional information concerning location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ-NRO, Richard Doucette at (703) 583-3813.

6. Wildlife Resources and Protected Species. The project sponsors should coordinate with DGIF's Regional Aquatic Resources Biologists at (540) 899-4169, regarding the draining of Huntsman Lake and plans to refill and stock the lake.

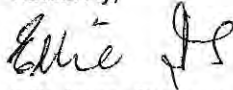
7. Water Supply. Coordinate with the Fairfax County Department of Public Works and Environmental Services at (703) 324-5033, concerning any potential impacts to the local water supply.

8. Historic Resources. The NRCS must continue to coordinate this proposal with the Department of Historic Resources and the Advisory Council on Historic Preservation with regard to the completion of a Programmatic Agreement under *Section 106 NHPA*. For additional information and coordination, contact DHR, Roger Kirchen at (804) 482-6091.

9. Coastal Zone Management Act and Federal Consistency. Pursuant to the *Coastal Zone Management Act of 1972*, as amended, any activity requiring a federal license or permit affecting any coastal use or resource must be conducted in a manner consistent with the federally approved Virginia Coastal Zone Management Program (VCP) (see § 307(c)(3)(A) of the *Act* and 15 CFR Part 930, Subpart D, § 930.50 *et seq.*). This involves an analysis of the activity in light of the Enforceable Policies of the VCP (see Attachment 1), and submission of a Federal Consistency Certification (FCC) reflecting that analysis and committing the proponent agencies to comply with the Enforceable Policies. Section 930.58 gives content requirements for the consistency certification, or you may visit the DEQ Website at, <http://www.deq.virginia.gov/eir/federal.html>. We encourage the proponent agencies to consider the Advisory Policies of the VCP (see Attachment 2). The FCC must be submitted and DEQ's concurrence obtained prior to any land disturbance in the Commonwealth's designated coastal zone.

Thank you for the opportunity to review the Supplemental Watershed Plan No. 6 and Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed, Fairfax County. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 698-4325 or John Fisher at (804) 698-4339 for clarification of these comments.

Sincerely,



Ellie Irons, Program Manager
Environmental Impact Review

Enclosures

Rehabilitation of Floodwater Retarding Structure No. 8
Pohick Creek Watershed

Ec: David Hartshorn, DEQ-NRO
Richard Criqui, DEQ- LPRD
Kotur Narasimhan, DEQ-Air
Tony Watkinson, VMRC
Amy Ewing, DGIF
Robbie Rhur, DCR
Barry Matthews, VDH
Roger Kirchen, DHR

Cc: Fred Selden, Fairfax County
G. Mark Gibb, Northern Virginia Regional Commission



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

Attachment 1

Enforceable Regulatory Programs comprising Virginia's Coastal Zone Management Program (VCP)

- a. **Fisheries Management** - The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (VMRC); Virginia Code 28.2-200 to 28.2-713 and the Department of Game and Inland Fisheries (DGIF); Virginia Code 29.1-100 to 29.1-570.

The State Tributyltin (TBT) Regulatory Program has been added to the Fisheries Management program. The General Assembly amended the Virginia Pesticide Use and Application Act as it related to the possession, sale, or use of marine antifoulant paints containing TBT. The use of TBT in boat paint constitutes a serious threat to important marine animal species. The TBT program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The VMRC, DGIF, and Virginia Department of Agriculture Consumer Services (VDACS) share enforcement responsibilities; Virginia Code 3.1-249.59 to 3.1-249.62.

- b. **Subaqueous Lands Management** - The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, tidal wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality (DEQ). The program is administered by the Marine Resources Commission; Virginia Code 28.2-1200 to 28.2-1213.
- c. **Wetlands Management** - The purpose of the wetlands management program is to preserve wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.
- (1) The tidal wetlands program is administered by the Marine Resources Commission; Virginia Code 28.2-1301 through 28.2-1320.
 - (2) The Virginia Water Protection Permit program administered by DEQ includes protection of wetlands --both tidal and non-tidal; Virginia Code §62.1-44.15:5 and Water Quality Certification pursuant to Section 401 of the Clean Water Act.

Attachment 1 continued

Page 2

- d. Dunes Management - Dune protection is carried out pursuant to The Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission; Virginia Code 28.2-1400 through 28.2-1420.
- e. Non-point Source Pollution Control - (1) Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by the Department of Conservation and Recreation; Virginia Code 10.1-560 et seq.

(2) Coastal Lands Management is a state-local cooperative program administered by the DCR's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater (see i) Virginia; Virginia Code §10.1-2100 –10.1-2114 and 9 VAC10-20 et seq.
- f. Point Source Pollution Control - The point source program is administered by the State Water Control Board (DEQ) pursuant to Virginia Code 62.1-44.15. Point source pollution control is accomplished through the implementation of:
 - (1) the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System (VPDES) permit program.
 - (2) The Virginia Water Protection Permit (VWPP) program administered by DEQ; Virginia Code §62.1-44.15:5 and Water Quality Certification pursuant to Section 401 of the Clean Water Act.
- g. Shoreline Sanitation - The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code 32.1-164 through 32.1-165).
- h. Air Pollution Control - The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code 10-1.1300 through §10.1-1320).
- (i) Coastal Lands Management is a state-local cooperative program administered by the DCR's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act; Virginia Code §10.1-2100 –10.1-2114 and Chesapeake Bay Preservation Area Designation and Management Regulations; Virginia Administrative Code 9 VAC10-20 et seq.

Attachment 2

Advisory Policies for Geographic Areas of Particular Concern

- a. **Coastal Natural Resource Areas** - These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources:
 - a) Wetlands
 - b) Aquatic Spawning, Nursery, and Feeding Grounds
 - c) Coastal Primary Sand Dunes
 - d) Barrier Islands
 - e) Significant Wildlife Habitat Areas
 - f) Public Recreation Areas
 - g) Sand and Gravel Resources
 - h) Underwater Historic Sites.
- b. **Coastal Natural Hazard Areas** - This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are as follows:
 - i) Highly Erodible Areas
 - ii) Coastal High Hazard Areas, including flood plains.
- c. **Waterfront Development Areas** - These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows:
 - i) Commercial Ports
 - ii) Commercial Fishing Piers
 - iii) Community Waterfronts

Although the management of such areas is the responsibility of local government and some regional authorities, designation of these areas as Waterfront Development Areas of Particular Concern (APC) under the VCRMP is encouraged. Designation will allow the use of federal CZMA funds to be used to assist planning for such areas and the implementation of such plans. The VCRMP recognizes two broad classes of priority uses for waterfront development APC:

- i) water access dependent activities;
- ii) activities significantly enhanced by the waterfront location and complementary to other existing and/or planned activities in a given waterfront area.

Advisory Policies for Shorefront Access Planning and Protection

- a. Virginia Public Beaches - Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.
- b. Virginia Outdoors Plan - Planning for coastal access is provided by the Department of Conservation and Recreation in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.
- c. Parks, Natural Areas, and Wildlife Management Areas - Parks, Wildlife Management Areas, and Natural Areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.
- d. Waterfront Recreational Land Acquisition - It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.
- e. Waterfront Recreational Facilities - This policy applies to the provision of boat ramps, public landings, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.
- f. Waterfront Historic Properties - The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest are significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and the VCRMP to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.

Fisher, John (DEQ)

From: Hartshorn, David (DEQ)
Sent: Wednesday, July 13, 2011 2:23 PM
To: Fisher, John (DEQ)
Cc: Hartshorn, David (DEQ)
Subject: RE: New Project DEQ 11-114F

John,

After a page by page review of the project, it has been determined that the project adequately addresses issues related to programs that are overseen by this regional office at this time. Should there be changes or additional comments related to this project in the future, we will provide them with the review of the Federal Consistency documents associated with this proposal. Thank you.

R. David Hartshorn
Regional Air Compliance Manager
DEQ-NRO
13901 Crown Court
Woodbridge, VA 22193
(703) 583-3895
fax (703) 583-3821
e-mail - R.David.Hartshorn@deq.virginia.gov

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Fisher, John (DEQ)

From: Watkinson, Tony (MRC)
Sent: Wednesday, July 13, 2011 10:59 AM
To: Fisher, John (DEQ)
Subject: RE: New Project DEQ 11-114F

John,

Since the drainage area at the at the proposed work site is less than five square miles (2.32 sq. miles) we would not assume any jurisdiction over the submerged lands of Pohick Creek.

Tony Watkinson

Tony Watkinson
Chief, Habitat Management Division
Virginia Marine Resources Commission

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

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JUL 13 2011

DEQ-Office of Environmental
Impact Review

MEMORANDUM

DATE: July 13, 2011
TO: John Fisher, DEQ
FROM: Roberta Rhur, Environmental Impact Review Coordinator
SUBJECT: DEQ 11-114F, USDA/NRCS: Rehabilitation of Floodwater Retarding Structure No. 8 Pohick

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.

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.

*State Parks • Soil and Water Conservation • Natural Heritage • Outdoor Recreation Planning
Chesapeake Bay Local Assistance • Dam Safety and Floodplain Management • Land Conservation*

Division of Stormwater Management

Chesapeake Bay Local Assistance:

The draft supplemental watershed plan acknowledges that the Fairfax County has adopted ordinances that uphold the Chesapeake Bay Preservation Act and as such any dam rehabilitation must comply with these ordinances during the planning, design and construction phases of the project.

Erosion and Sediment Control:

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 greater than 2,500 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;].

General Permit for Discharges of Stormwater from Construction Activities in CBPA:

The operator or owner of construction activities involving land disturbing activities equal to or greater than 2,500 square feet in areas designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act 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 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 and Flood Plain Management

The Division of Dam Safety has reviewed the project and has no issues regarding this plan.

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

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JUN 24 2011

DEQ-Office of Environmental
Impact Review

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John E. Fisher

DEQ - OEIA PROJECT NUMBER: 11 - 114F

PROJECT TYPE: ☐ STATE EA / EIR ☒ FEDERAL EA / EIS ☐ SCC
☐ CONSISTENCY CERTIFICATION

PROJECT TITLE: REHABILITATION OF FLOODWATER RETARDING STRUCTURE NO. 8 OF
THE POHICK CREEK WATERSHED

PROJECT SPONSOR: USDA / NATURAL RESOURCES CONSERVATION SERVICE

PROJECT LOCATION: ☒ OZONE NON ATTAINMENT AND
EMISSION CONTROL AREA FOR NOX & VOC

REGULATORY REQUIREMENTS MAY BE APPLICABLE TO: ☒ 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. ☒ 9 VAC 5-130 et seq. - Open Burning
5. ☒ 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 5-80-10 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:

All precautions are necessary to restrict the emissions of volatile organic
compounds (VOC) and oxides of nitrogen (NO_x).

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: June 24, 2011



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JUL 01 2011
DEQ-Office of Environmental
Impact Review

MEMORANDUM

TO: John Fisher, Environmental Program Planner

FROM: Angela Alonso, DLPR Alt. Review Coordinator *Alonso*

THROUGH: Richard Criqui, DLPR Review Coordinator *Richard Criqui*

DATE: July 1, 2011

COPIES: Leslie A. Romanchik, Hazardous Waste Program Manager
EIR File

SUBJECT: Environmental Assessment – Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed – USDA/Natural Resources Conservation Service – DEQ Project No. 11-114F – Review

Staff from the Division of Land Protection and Revitalization (DLPR) (former Waste Division) has completed its review of the Report entitled *DRAFT Supplemental Watershed Plan No. 6 & Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed, Fairfax County, Virginia*, dated June 2011, and prepared by USDA Natural Resources Conservation Service. The project site appears to be located in Fairfax County, Virginia, in zip code areas 22015 (NW area of site) and 22153 (SE area of site) and bounded by zip codes 22039 (SW side of site) and 22152 (NE side of site).

We have the following comments concerning the Report and related waste issues associated with this project:

This Report did not address potential solid waste and/or hazardous waste issues. This Report does not state that DEQ's databases were searched, nor does it indicate that information was obtained from the DEQ's DLPR files.

The DLPR staff has conducted a cursory review of its database files under zip codes 22015, 22153, 22039, and 22152 including a VEGIS database search (either 0.25 mile or 0.5 mile radius) of the project site and determined the information below.

A few facility waste sites of concern were located within the same zip code of proposed project under zip codes 22015, 22153, 22039, and 22152 and/or within the 0.25 mile to 0.5 mile radius from the project site. However, the proximity of identified waste sites to the project site and/or potential impact to the project should be further evaluated, if not done so already.

The staff's summary comments are as follows:

Hazardous Waste Facilities

Search of the RCRAInfo database found the following large quantity generators (LQGs) or permitted treatment, storage, disposal (TSD) facility:

- EPA ID: VAD981941040 | Sicpa Securink Corp. | 8000 Research Way Springfield, VA 22153 | LQG | Facility Contact: David Wassum (703) 455-8050.

(See also: <http://www.epa.gov/enviro/facts/rcrainfo/search.html>.)

Solid Waste Facilities

Search of DEQ's Solid Waste Sites Inventory found the following facility:

- Permit by Rule (PBR) 152, Materials Recovery Facility | Metalpro Incorporated | 7956 Twist Lane, Springfield, VA 22153 | Solid Waste Unit Status – Active | Solid Permit Status – Permitted.

CERCLA Sites

No Superfund sites were found during search of the CERCLIS database.

FUDs Sites

Search of the DEQ's Formerly Used Defense Sites (FUDS) Inventory found the following facility:

- FUDS ID: C03VA0249 | Federal Facilities (FF) ID: VA9799F1675 | NIKE W-BA-74 | Fairfax, VA 22039

If the above identified site is found to be in close proximity to the proposed project, then further information regarding the above identified site may be in order. For the location and further information regarding the above FUDS site, please contact Karen Sismour, Federal Facilities Program Manager, Office of Remediation Programs (ORP), DEQ (804-698-4421).

VRP Sites

Voluntary Remediation Program (VRP) sites were found on DEQ's VRP Site Inventory as follows:

- VRP00246 | Crest Dry Cleaners | 22015 | Certificate Issued
- VRP00377 | Cardinal Forest Plaza/Cosmo Cleaners | 22152 | Certificate Issued
- VRP00554 | Crest Cleaner (Huntsman Square) | 22153 | Enrolled in Program

Please note that the DEQ's VRP case file within the above zip code should be further evaluated by the project engineer or manager to establish the exact location, the nature and extent of the release, and the potential to impact the proposed project. The facility representative should contact the DEQ's VRP Program and/or the DEQ's Northern Regional Office (NRO) for further information on the administrative records of the VRP case which may be in close proximity to the proposed project.

(VRP Contacts: <http://www.deq.virginia.gov/vrp/contactus.html>,
NRO Contacts: <http://www.deq.virginia.gov/regions/northern.html>.)

Petroleum Release Sites

The following petroleum release sites were found within 0.50 miles of the project site from the DEQ's Virginia Environmental Geographic Information System (VEGIS):

PCNUM	FACILITY NAME	FACILITY ADDRESS	CITY	ZIP CODE	LAST_EDIT DATE	STATUS
20093045	Higgins James Estate	6722 Stonecutter Dr	Burke	22015	9/25/2008	Closed
	Dorn Kathleen					
20033203	Residence	9767 Turnbuckle Rd	Burke	22009	3/31/2006	Closed
19973198	Welch Property	6712 Stonecutter Dr	Burke	22015	3/30/2007	Closed
	Scavongelli Gary					
20033175	Residence	9765 Turnbuckle Dr	Burke	22015	3/29/2006	Closed
	Osterhout James D					
20103284	Residence	9633 Ironmaster Dr	Burke	22015	7/6/2010	Closed
20043126	Chang Chaun Residence	9809 Pulham Rd	Burke	22015	2/1/2006	Closed
	Nguyen Huan Van					
20093040	Residence	6716 Stonecutter Dr	Burke	22015	9/17/2008	Closed
19940472	Hulick Scott Residence	9813 Pulham Rd	Burke	22015	3/29/2007	Closed
19963117	Gamrat Betsy Residence	9811 Pulham Rd	Burke	22015	3/23/2006	Closed

(Note: Dates above are the latest PC database edit dates of the specific PCNUM.)

Please note that the DEQ's PC case files of the PCNUM, within 0.50 miles of the proposed project, should be evaluated by the project engineer or manager to establish the exact location of the petroleum release, the nature and extent of the release, and the potential to impact the proposed project. The facility representative should contact the DEQ's Northern Regional Office for further information on the administrative records of the PC cases which are in close proximity to the proposed project.

(NRO Pollution Response Contact: <http://www.deq.virginia.gov/regions/northern.html>.)

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.

Please note that any contaminated media which is generated from the facility project site is the responsibility of the subject site facility who must ensure that contaminated media undergoes proper management, storage, treatment, and disposal in accordance with the above noted State Regulations.

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 Angela Alonso at (804) 698-4328.

Fisher, John (DEQ)

From: Ewing, Amy (DGIF)
Sent: Wednesday, July 06, 2011 12:40 PM
To: Fisher, John (DEQ)
Cc: Odenkirk, John (DGIF); Busch, Rick (DGIF)
Subject: ESSLog# 32047_11-114F_Rehabilitation of dam #8, Pohick Creek watershed

We have reviewed the subject project that proposes to perform repairs on dam #8 in the Pohick Creek watershed in order to bring it up to safety standards. This will require realigning the auxiliary spillway and armoring it as well as extending the training dikes, raising the dam by 0.6 feet and replacing the spillway riser with a baffle-type riser.

We do not currently document any listed wildlife or resources under our jurisdiction from the project area. Therefore, we do not anticipate this project to result in adverse impacts upon such species and resources.

We recommend coordination with our regional Aquatic Resources Biologists at 540-899-4169 regarding the draining of Huntsman Lake and the plan to refill and stock the lake.

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

Fisher, John (DEQ)

From: Forsgren, Diedre (VDH)
Sent: Wednesday, June 22, 2011 10:52 AM
To: Fisher, John (DEQ)
Cc: Matthews, Barry (VDH)
Subject: (11-114F) EA: Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed

DEQ Project #: 11-114F
Name: Rehabilitation of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed
Sponsor: USDA/Natural Resources Conservation Service
Location: Fairfax County

VDH – Office of Drinking Water has reviewed DEQ Project Number 11-114F. 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 mile radius of the project site.

One surface water intake is located within a 5 mile radius of the project site. The Fairfax County Water Authority/Occoquan Reservoir intake is up-gradient of the project location.

Project does not fall within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any 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

Fisher, John (DEQ)

From: Kirchen, Roger (DHR)
Sent: Wednesday, July 13, 2011 10:55 AM
To: Fisher, John (DEQ)
Subject: RE: New Project DEQ 11-114F

DHR is consulting directly with NRCS pursuant to Section 106 of the National Historic Preservation Act and will provide comment directly to NRCS. Thanks for following up.

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
www.dhr.virginia.gov*

Fisher, John (DEQ)

From: Bell, John [John.Bell@fairfaxcounty.gov]
Sent: Wednesday, June 29, 2011 10:15 AM
To: Fisher, John (DEQ)
Cc: Kumar, Dipmani; Nee, Pamela
Subject: Federal Project # 11-114F Rehab of Floodwater Retarding Structure No. 8 of the Pohick Creek Watershed

John,

We will have no comments regarding the above-noted project. However, I've spoken with Dipmani Kumar, Fairfax County, Department of Public Works, and he is preparing comments he plans to send directly to USDA/NRCS regarding the proposed work. You may want to contact him regarding this project.

*John R. Bell, Planner III
Fairfax County
Department of Planning & Zoning
(703) 324-1278*

3060 Williams Drive, Suite 510
Fairfax, VA 22031
www.nvaregion.org



Northern Virginia Regional Commission

Voice: 703 642-0700
Fax: 703 642-5077

RECEIVED

JUL 07 2011

DEQ-Office of Environmental
Impact Review

July 7, 2011

John E. Fisher
Environmental Program Planner
Department of Environmental Quality
629 East Main Street, Sixth Floor
Richmond, VA 23219

Re: 11-114F

Dear Mr. Fisher:

The Northern Virginia Regional Commission staff has reviewed the document described above and has the following comments.

Please be advised that the counties of Arlington, Fairfax, and Prince William, the City of Alexandria, and the Town of Herndon, have all enacted jurisdiction-wide Chesapeake Bay Resource Management Area (RMA) designation. This RMA designation requires that all development must comply with the local ordinance's stormwater quality requirements.

We would also suggest that, where possible, opportunities for retrofit of existing stormwater quantity facilities to stormwater **quality** facilities through new construction activities should be explored. NVRC's *Guidebook for Maintaining BMPs in Northern Virginia* is available, without charge, should you need it, and can also be downloaded from our website.

A copy of this letter should be included with your submission to indicate that the review by this agency has been completed.

Thank you for this opportunity to participate in the intergovernmental review process.

Sincerely,

Samantha Kinzer
Environmental Planner

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Hon. Harry J. Parrish II

Vice Chairman

Hon. Martin E. Nohe

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Town of Dumfries

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Town of Herndon

Hon. Steve DeBenedittis

Town of Leesburg

Hon. Kenneth "Ken" Reid

Town of Purcellville

Hon. Robert W. Lazaro, Jr.

Town of Vienna

Hon. M. Jane Seeman

(as of February 16, 2011)

United States Department of Agriculture



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

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

July 21, 2011

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 Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Ms. Irons:

Thank you for providing the Commonwealth's consolidated comments on the referenced project. We also received individual comments from Fairfax County, the Virginia Department of Conservation and Recreation's Division of Natural Heritage, and the Virginia Department of Historic Resources. We appreciate your support of this project.

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.

In addition, Fairfax County will determine the consistency of this project's activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Resources Management Program.

If questions or concerns arise as the project proceeds, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,

W. Ray Drott
Acting For JOHN A. BRICKER
State Conservationist

Helping People Help the Land
An Equal Opportunity Provider and Employer

Huntsman Lake dam repairs, structure #8
July 13, 2011

Copy: Cindy Walsh, Director, Resource Management Division
Todd Johnson, Director, Operations Division
Dave Bowden, Director Planning and Development Division
Julie Cline, Manager, Land Acquisition Branch
Kirk Holley, Manager, Special Projects Branch
Sandy Stallman, Manager, Park Planning Branch
Pat Rosend, Senior Planner, Park Planning Branch
Elizabeth Crowell, Manager, Cultural Resource Management Division
Mark Rogers, Manager, Area 4 Operations
Chron Binder
File Copy



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

July 15, 2011

John A. Bricker
State Conservationist
USDA-NRCS
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229

Reference: Pohick Creek Watershed Dam #8, Huntsman Lake Dam

Dear Mr. Bricker:

We have reviewed the Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the rehabilitation of Pohick Creek Watershed Dam No. 8 (Huntsman Lake). As one of the project sponsors, we concur with and support the preferred rehabilitation alternative in the draft EA. Fairfax County, as the owner and operator of the Lake Huntsman Dam, is committed to rehabilitating the dam. We look forward to working with the NRCS and the Northern Virginia Soil and Water Conservation District to complete the design and construction of this project, so that the Huntsman Lake Dam principal spillway riser and auxiliary spillway meet current NRCS and Virginia Dam Safety performance standards.

We have enclosed for your consideration a number of comments on the draft EA. Also attached are comments on the draft EA we received from the Fairfax County Park Authority.

Sincerely,

Don Demetrius, PhD, P.E., Chief
Watershed Projects Evaluation Branch

Enclosures: As Stated

cc: John E. Fisher, Office of Environmental Impact Review, Virginia Department of
Environmental Quality
Marlae Schnare, Senior Legislative Aide, Springfield District

Department of Public Works and Environmental Services
Stormwater Planning Division
12000 Government Center Parkway, Suite 449
Fairfax, VA 22035-0052
Phone: 703-324-5500, TTY: 711, FAX: 703-802-5955
www.fairfaxcounty.gov/dpwes



**Supplemental Watershed No.6 and Environmental Assessment for the Rehabilitation of Floodwater
Retarding Structure No. 8 (Huntsman Lake) of the Pohick Creek Watershed**

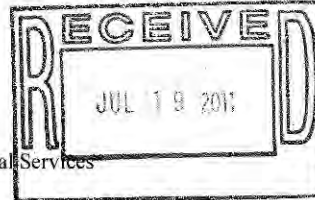
Fairfax County Department of Public Works and Environmental Services Comments

1. Page 7, first paragraph: Schnabel Engineering did not conduct any of the surveying for this project. Please modify the first sentence in this paragraph appropriately and add the following sentence: "Baseline topographic and hydrographic surveys were completed by A. Morton Thomas Associates under a separate contract with Fairfax County."
2. Page 12, first paragraph, second last sentence: Add "...majority of the..." before "watershed" in this sentence.
3. Page 12, second paragraph, first sentence: Modify to "...and is part of one of the..."
4. Page 29, Issue 3: While we agree with the choice of 75 years for the planned life of the rehabilitated structure, we do not believe it was our choice. Please modify the sentence alluding to this appropriately.
5. Page 34, last paragraph, last sentence: Please change "needed" to "existing". Please also change "No. 1" in the community association name to "#1".
6. Page 52: Based on a recent communication from the Park Authority, it will be necessary to acquire an easement for the new spillway footprint on parkland. We therefore recommend that the second sentence under Easements and Landrights be modified as follows: "Additional easements will be required on both property owned by the Fairfax County Park Authority and the Lakewood Hills #1 Community Association."
7. Page 53, Mitigation: It is not clear which Regional Water Resource Plan is being referenced. Under the County's Chesapeake Bay Preservation Ordinance, unavoidable tree loss for an allowed use in the Resource Protection Area (RPA) must be mitigated by establishing an equivalent buffer at a 1:1 ratio with specified densities of trees and shrubs. Please correct this section appropriately. See Comment #9 below also.
8. Page 55, fourth bullet: Suggest changing this to: "Acquire a regular Operation and Maintenance certificate from DCR Dam Safety upon completion of the planned measures."
9. Parklands and Resource Protection Area impacts: At a number of places in the document (see pages 34, 39, 46, and 47) it is noted that the total project footprint is 3.3 acres, which includes the removal of 1.3 acres of trees that will be mitigated by planting 2.5 acres of trees. In the Schnabel H&H report, however, it is noted that the project footprint is estimated to be 3.4 acres, with 1.4 acres of trees impacted and mitigation required the RPA area impacted which is 2.5 acres. Therefore the 2.5 acres of mitigation required is for impacts within an RPA (with or without existing tree cover), while the actual tree loss is estimated to be 1.4 acres, and the total project footprint is 3.4 acres. We recommend correcting these discrepancies and also correcting the reason for 2.5 acres of mitigation.



FAIRFAX COUNTY PARK AUTHORITY

M E M O R A N D U M



TO: Dipmani Kumar, Project Manager
Stormwater Planning Branch
Department of Public Works and Environmental Services

FROM: David Bowden, Director, Planning and Development Division

DATE: July 14, 2011

SUBJECT: Huntsman Lake Dam Repairs, Structure #8
Pohick Creek Watershed

Huntsman Lake Park is located adjacent to Huntsman Lake and is owned by the Fairfax County Park Authority. A master plan for its planned development was approved by the Park Authority Board in September 1984. Planned uses include trails, playground, multi-use court and picnic area. The master plan has been implemented at this park and serve the community well for a number of outdoor enjoyment purposes. The Park Authority has reviewed the Draft Rehabilitation Plan and generally supports the need to bring the dam into current safety compliance. The following comments are provided

1. The Park Authority has limited information on the existing dam. Staff requests any existing conditions plans or agreements be provided.
2. In the case that the proposed site work and repairs exceed the current footprint boundary, there will need to be additional easements and agreements with the Park Authority for these areas.
3. The Park Authority requests the opportunity to review detailed design and construction plans for this project to determine the new dam boundaries, areas of tree loss, access, staging, mowing limits, frequency etc. All features that need to be placed in easements will need a deed and plat. Any park features, such as fences, railing, signs, etc, that are within the limits of disturbance will need to be relocated.
4. The area of replanting has not been noted. If the mitigation plantings are to be on parkland, The Park Authority will need to review and approve all planting plans.
5. The Plan states: *"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 near the dam. The trail over the dam will be moved temporarily and will remain open to the extent possible"*. There are no Park Authority maintained trails in the area of the proposed project. Staff supports closure of any informal trails or paths in the area during construction for safety reasons. Informal trails may be relocated if there is no impact to parkland or existing vegetation.
6. Park Authority staff suggests seeking options to enhance or modify the proposed spillway construction technique to achieve a more natural looking structure appropriate for a stream valley park setting.
7. The draft rehabilitation plan does not identify construction access and staging areas or temporary construction areas, so the full impact of the proposed project cannot be evaluated and commented on at this time. Park Authority should be involved at all stages of the project to help guide project design to minimize impacts to park resources, plan for both on-site restoration and off-site mitigation (to the extent that it impacts parkland), and participate in

- construction and restoration meetings to ensure compliance with project plans and specifications as they pertain to impacts to parkland and resources.
8. The project plan references forested wetlands downstream of the dam but does not provide a wetlands locator map. We request that copies of all wetland inventories and delineations for wetlands on parkland be provided to the Park Authority.
 9. We request that any mitigation for impacts to streams and wetlands as required for the project be provided within the same local watershed as the project impacts, and at the minimum within Fairfax County.
 10. The report references in several locations that the vegetation to be disturbed is vegetation common to the area. On page 11 of the report there is a very rudimentary sketch of natural resources in the project area to include water quality, water resources, vegetation and wildlife. The report does not describe what these characterizations were derived from. Please provide descriptions and copies of any inventories conducted on parkland to assess the resources present. If no formal survey was done, then the Park Authority requests that it be done as part of the project planning process in consultation with staff.
 11. In Table S1 and elsewhere in the report the statement is made that there are no Natural Areas present. There are natural areas present on parkland that will be impacted by the project. The statements in the report should be corrected to express the intent that there are no State Designated Natural Areas present.
 12. In Table S1 underwater resource impacts, it is noted that there will be impacts to wildlife when the lake is drained. Staff recommends that the project plans include a careful drawdown of the lake in coordination with staff from the Virginia Department of Game and Inland Fisheries to 1) allow fish to move up or down stream (through the drainage structure or large siphon) to the greatest extent possible, 2) avoid winter and summer and ideally draw down in the fall to minimize mortality and negative impacts on reptiles and amphibians by avoiding breeding and primary activity seasons and before they go into hibernation (so they can hibernate elsewhere if possible), 3) ideally draw down in the fall to avoid impacts on migrant and breeding bird populations, and 4) minimize erosive impacts on the receiving stream and avoid impacting summer base flows when the fauna in the receiving stream are most vulnerable to drying out.
 13. All plant materials (seed and plant stock) used on parkland must be locally common native species preferably of locally genetic stock from suppliers approved by the Park Authority.
 14. The report references off-site plantings of mitigation of forest resource impacts. Have the off-site planting areas been identified? All off-site planting should be in the same local watershed as in previous projects. All off-site plantings for impacts to resources on Fairfax County parkland must also be on Fairfax County parkland.
 15. The undertaking is a federal action, subject to Section 106 of the National Historic Preservation Act. In 2007, URS Corporation was employed to conduct Phase I testing to address this requirement. URS conducted the fieldwork and prepared a report entitled *Management Summary: Phase I Archaeological Survey for Huntsman Lake Rehabilitation* submitted in January 2008. The report concluded that no sites had been discovered and no further archaeological testing was recommended. In a letter dated, April 15, 2008, Virginia Department of Historic Resources concurred with these findings. No further archaeological investigations are warranted as part of this undertaking.

Thank you for the opportunity to comment on this preliminary Plan. We appreciate your follow up on the items noted in these comments. The point of contact for this project will be Pat Rosend who can be reached at 703-324-2387 or prose1@fairfaxcounty.gov.

United States Department of Agriculture



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

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

July 21, 2011

Donald Demetrius, Chief
Watershed Projects Evaluation Branch
Department of Public Works and Environmental Services
Stormwater Planning Division
12000 Government Center Parkway, Suite 449
Fairfax, VA 22035-0052

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the
Rehabilitation of Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Mr. Demetrius:

Thank you for your timely review of the referenced Draft EA. We appreciate your support of this project. We also appreciate your coordination with the Fairfax County Park Authority and the Environmental and Development Review Branch of the Department of Planning and Zoning. We will give careful consideration to the specific comments you raised as we develop the final plan for this project. Many of the comments will need to be addressed during the design and/or implementation phases of the project.

We appreciate the time and consideration given by Fairfax County staff and the members of the Huntsman Lake Task Force throughout the planning process. We especially appreciate the cooperation and participative spirit we have experienced from the public toward this worthwhile project.

As the project proceeds, we look forward to working with Fairfax County staff, the Fairfax County Board of Supervisors, and the Northern Virginia Soil and Water Conservation District in a joint effort to rehabilitate the Huntsman Lake Dam.

If questions or concerns arise as the project proceeds, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,

A handwritten signature in black ink that reads "W. R. Bricker".

JOHN A. BRICKER
State Conservationist

Acting For

Helping People Help the Land
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BOARD OF DIRECTORS
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Diane Hoffman, *District Administrator*



Phone: 703-324-1460
Fax: 703-324-1421
E-mail: conservationdistrict@fairfaxcounty.gov
Website: www.fairfaxcounty.gov/nvswcd

COMMONWEALTH of VIRGINIA

Northern Virginia Soil and Water Conservation District

12055 Government Center Parkway • Suite 905 • Fairfax, VA 22035-5512

July 15, 2011

John Bricker
State Conservationist
Natural Resources Conservation Service, USDA
1606 Santa Rosa Road, Suite 209
Richmond, VA 23229

Dear Mr. Bricker:

The Northern Virginia Soil and Water Conservation District has reviewed the *Draft Supplemental Watershed Plan – Environmental Assessment* for the Pohick Creek Watershed – Supplement No. 6 for the rehabilitation of Dam No. 8 (Huntsman Lake).

We commend NRCS for the excellent work on this document. We do not have any comments to make on the information presented; however, we have a few minor edits and clarifications to suggest, which we are sending informally and separately.

We are pleased to be a sponsor, along with the Fairfax County Board of Supervisors, of the Pohick Creek Watershed Project, which has proven to be extremely beneficial to the residents of the Fairfax County, providing flood protection as well as valuable environmental and recreational benefits. We look forward to the successful rehabilitation of Dam Site 8, which, along with the five other Pohick Creek PL-566 structures will continue to provide important and valuable long-term benefits.

Sincerely,

A handwritten signature in cursive script that reads "Jean R. Packard".

Jean R. Packard
Chairman, NVSWCD Board of Directors

-More Than 60 Years of Conservation Leadership-



United States Department of Agriculture



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

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

July 21, 2011

Ms. Jean Packard
Chair, Board of Directors
Northern Virginia Soil and Water Conservation District
12055 Government Center Parkway, Suite 905
Fairfax, VA 22035-5512

Re: Draft Supplemental Watershed Plan-Environmental Assessment (EA) for the
Rehabilitation of Pohick Creek Watershed Dam No. 8 (Huntsman Lake), Fairfax
County, Virginia

Dear Ms. Packard:

Thank you for your review of the referenced Draft EA. We appreciate your support of the project and will include your comments in the final document, as deemed appropriate.

As this project proceeds, we look forward to working with the Northern Virginia SWCD and the Fairfax County Board of Supervisors in a joint effort to enhance the Huntsman Lake Dam.

If questions or concerns arise as the project proceeds, Wade Biddix, the Assistant State Conservationist (Programs), can be reached by e-mail at wade.biddix@va.usda.gov or by phone at 804-287-1675.

Sincerely,

A handwritten signature in black ink, appearing to read "John A. Bricker".

JOHN A. BRICKER
State Conservationist

Cc: Supervisor Pat Herrity, Springfield District, Fairfax, Virginia
Dipmani Kumar, Department of Public Works, Fairfax, Virginia

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APPENDIX B

PROJECT MAPS

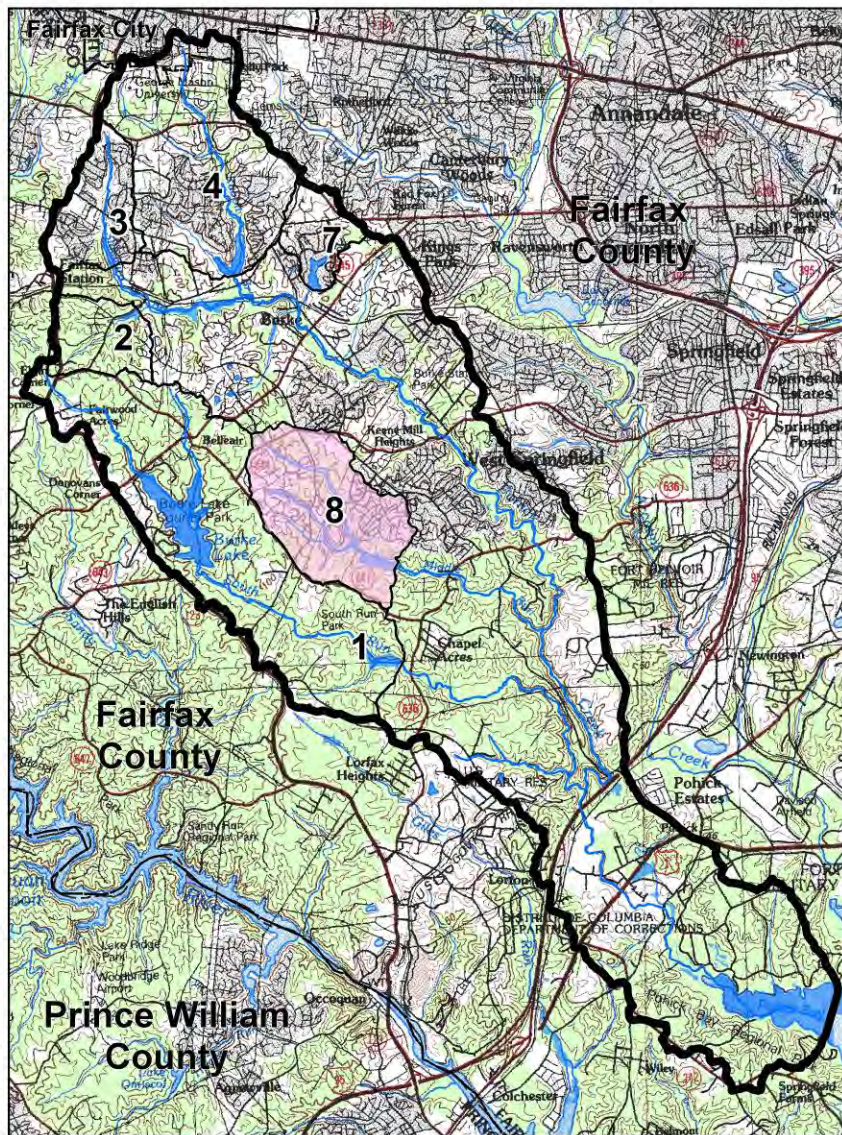





Figure B1. Pohick Creek Watershed

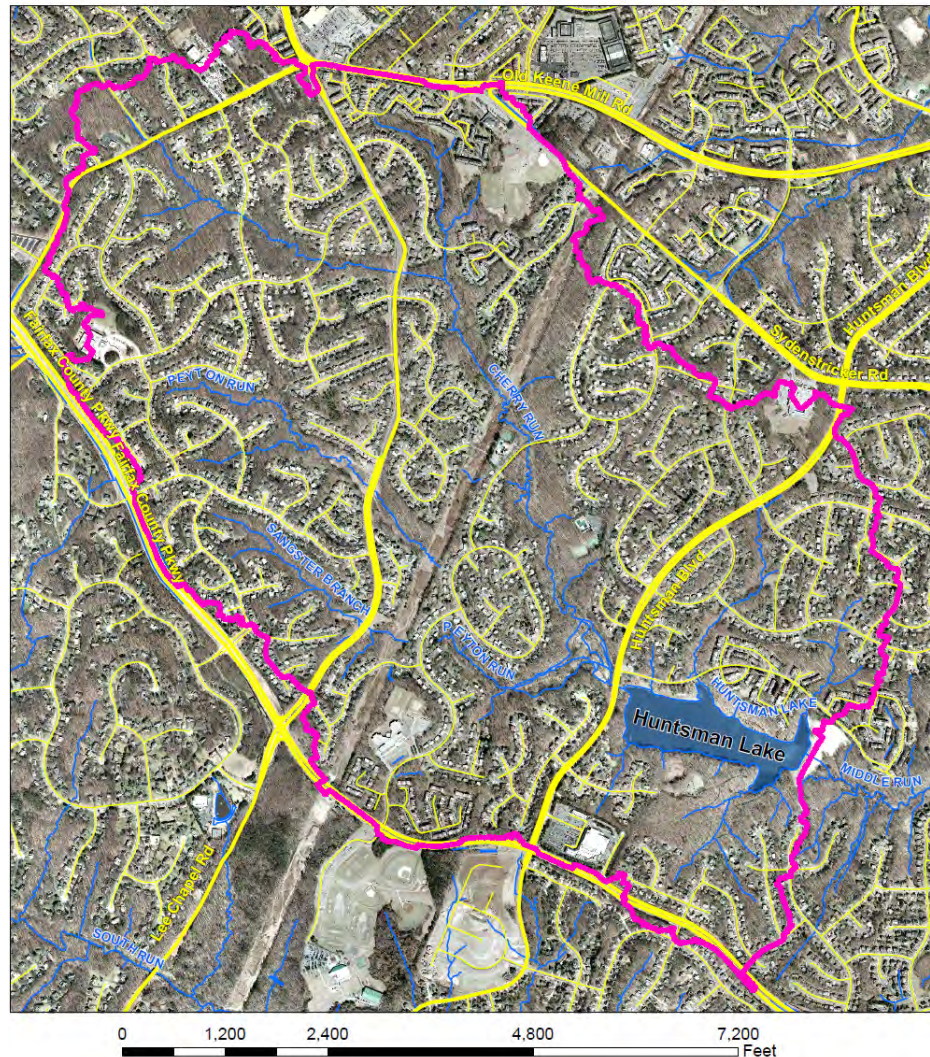
Legend

-  Pohick Creek 8 Sub-Watershed
-  Pohick Creek 12 Digit HUC
-  Main Streams
-  Main Water Bodies
-  County / City Boundaries

DAM SITE NAME	SUB-WATERSHED NAME
POHICK CREEK NO. 1	LAKE MERCER
POHICK CREEK NO. 2	LAKE BARTON
POHICK CREEK NO. 3	WOODGLEN LAKE
POHICK CREEK NO. 4	LAKE ROYAL
POHICK CREEK NO. 7	LAKE BRADDOCK
POHICK CREEK NO. 8	HUNTSMAN LAKE

Figure B2. Huntsman Lake Watershed

Pohick - Huntsman Lake 2007 VGIN Orthophotography (With VDOT Roads)



Legend

-  Huntsman Lake Watershed Boundary
-  Huntsman Lake Pool Area
-  VDOT Main Roads
-  VDOT Roads
-  Streams

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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
Thornecliff Lane	_*	_*	_*	_*	11.2
Hooes Road	_*	_*	_*	0.8	12.0
Fairfax County Parkway	_*	_*	_*	_*	_*
Gambrill Road	_*	_*	_*	_*	6.2

*Beneath the road

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

Reach	Location (Building Address, Road Name, or Cross Section)	River Station (#)	Building or Roadway Elevation (ft)	Sunny Day Breach Water Surface Elevation (ft)	Maximum Discharge (cfs)
Middle Run	Sanitary Sewer 1	12446	Under-ground	238.5	40,300
	Sanitary Sewer 2	11825	Under-ground	234.9	39,500
	Thornecliff Ln	10004	215.0	226.2	38,200
	Hooes Rd (SR 638)	9022	204.0	216.0	35,100
	Fairfax County Parkway (State Route 7100)	7917	226.0	215.2	34,900
	Gambrill Rd	4850	195.0	201.2	29,900
	Telephone Line	2485	Overhead	176.3	27,300
Pohick Creek (P2)	Section 32508	32508	-	163.3	21,400
	Section 30657	30657	-	154.5	21,200
	Electric Line	28576	Overhead	144.1	21,100
	Gas Line	28266	Under-ground	142.1	21,000
	Section 25933	25933	-	115.4	21,000
	Pohick Road (SR 641)	23848	99.0	90.5	20,900

APPENDIX D

RECORD OF INVESTIGATION AND ANALYSIS

Appendix D. Investigation and Analysis Used in the Planning for the Rehabilitation of Pohick Creek Dam Site No. 8.

Threatened and Endangered Species: Identification of Federal and State listed threatened and endangered plant and animal species within a two mile radius of the project area was determined using the Virginia Fish & Wildlife Information Service website, a publication of the Virginia Department of Game and Inland Fisheries. A search of the Virginia Eagles Nest Locator website, hosted by the Center for Conservation Biology within the College of William and Mary, revealed no nests within 1,000 feet of the project site. Field visits were conducted in October 2010 and May 2011.

Cultural Resources, Natural and Scenic Areas, and Visual Resources: A pedestrian survey of the dam area downstream for 200 meters was conducted in December 2007. No indications of archaeological or historical sites were uncovered during this survey. A Phase I survey was also completed in December 2007. Twenty-eight shovel test pits (STPs) were dug, and 5 artifacts were uncovered from 3 STPs. The report, *Management Summary: Phase I Archaeological Survey for Huntsman Lake Rehabilitation*, done by URS Corporation, was released in January 2008. The site was determined ineligible for the NRHP, and no further work was recommended. The VDHR has concurred with these findings

The absence of Natural Heritage Resources, including Scenic Areas and Visual Resources, was determined by review of the Virginia Department of Conservation & Recreation Natural Heritage Resource Map for Fairfax County.

Water Quality: Impaired stream and lake listings and supporting information was taken from the Virginia DEQ 2008 305(b)/303(d) Integrated Water Quality Assessment and Impaired Waters Report.

Wetlands: A wetland investigation for Huntsman Lake was completed during October 2010. Prior to conducting fieldwork, an off-site evaluation was completed. NRCS consulted the Fairfax 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 flat to moderately sloping site within the floodplain of Middle Run. The NWI mapping depicts forested wetlands downstream of the dam within the floodplain of Middle Run and emergent wetlands upstream of the inlet within the floodplain of Middle Run. Fieldwork was conducted using methods as outlined in the *1987 Corps of Engineers Wetland Delineation Manual*.

Forest and Wildlife Resources: Information on the potential natural vegetation of northern Virginia and associated wildlife resources was obtained from The Natural Communities of Virginia Classification of Ecological Community Groups, VADCR, Natural Heritage Division, and the Virginia Comprehensive Wildlife Conservation Strategy, VDGIF, 2005.

Chesapeake Bay and/or Coastal Zone Management Areas: Information on the Chesapeake Bay Act and Coastal Zone Management Areas was taken from DEQ program literature.

Geology: Reference for this plan: The Geologic Map of Virginia, 1993, compiled by the Commonwealth of Virginia Department of Mines, Minerals, and Energy.

Sediment: For this project, Fairfax County had a sediment survey completed in 2008. That survey showed that the as-built sediment pool was 210 acre-feet which is greater than the 173 acre-feet called for in the design. It is speculated that the amount of borrow taken from the pool area was more than originally planned. The survey and dredging showed that 30% of the sediment originally predicted to flow into Huntsman Lake had done so in the period from dam construction in 1973 to 2008 (35 years). The sedimentation rate for this time period was 1.54 acre-feet/year. The projected rate of sedimentation for future years is estimated to be the same as in the past.

HYDRAULICS AND HYDROLOGY

Background: A May 2001 report on the integrity of the Pohick 8 auxiliary spillway, prepared by Gannett Fleming, Inc. for Fairfax County, showed the stability and integrity of the soils were not sufficient to pass the PMP event without a breach of the dam. In 2008, Fairfax County commissioned the engineering firm of Schnabel Engineering to conduct an analysis of the existing auxiliary spillway, evaluate rehabilitation alternatives, and quantify the effects of a breach on the downstream watershed. Hydrologic and hydraulic investigations consisted of an analysis of rainfall runoff relationships of the watershed. The models were calibrated by comparing the output files to previous modeling.

Precipitation Data and Hydrologic Data: Schnabel used the 2004 NOAA-14 and NOAA Hydrometeorological Report No. 51 precipitation data 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
2004	5.34	8.34	12.2	27.6	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 provided by Fairfax County and developed in conjunction with NRCS. A digital soil data set for the watershed was generated by NRCS using the Fairfax County detailed soil survey.

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 Pohick Creek Dam Site No. 8 Emergency Spillway Investigation study by Gannett Fleming, Inc., dated May 2001. 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 Pohick Creek Watershed including the existing Huntsman Lake, the other Pohick Creek Watershed Project dams, and Burke Lake. Fairfax County provided two HEC-HMS models: one containing a detailed analysis upstream of the confluence of Middle Run with Pohick Creek, and another downstream of the confluence of Middle Run with Pohick Creek. 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 a Triangular Irregular Network (TIN) of the land surface created from the mass points and breaklines, and surveyed structure data.

Breach Modeling: In accordance with the National Engineering Manual and instructions from the State Conservation Engineer, the breach zone is determined by a breach that could occur if both the principal and auxiliary spillways were blocked, the reservoir was full, and the dam failed under “sunny day” conditions. The criteria defined in TR-60, Earth Dams and Reservoirs, was used to determine the peak discharge of 42,272 cfs for the breach hydrograph, with the height of the water at 44.5 feet.

For the dam breach analysis, the breach hydrograph was developed using the equation in TR-66, and the breach hydrograph was routed downstream using the unsteady HEC-RAS model to identify the water surface elevations within the downstream floodplain for the breach event. The unsteady flow HEC-RAS model utilized geometry data from a HEC-RAS model of Pohick Creek Watershed stream provided by Fairfax County. The geometry included cross section developed from a Triangular Irregular Network (TIN) of the land surface created from the mass points and breaklines, and surveyed structure data. Manning’s roughness coefficient, “n” values for the channel and overbank flow were 0.04 and 0.013 to 0.1, respectively.

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 2009 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, interviews with residents, businesses and local government officials within the watershed. Detailed data on the homes and other structures within the floodplain, breach inundation zone, and breach flood pool of the Huntsman Lake watershed were obtained either from field surveys or from the Fairfax County Department of Public Works and Environmental Services, Stormwater Planning Division, Watershed Project Evaluation and Implementation Branch.

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.

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 2011 prices. The costs of 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 75-year useful life. Thus, a 77 year period of analysis was used along with the mandated 4.125% discount rate for all federal water resource projects for FY11 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.”