REPORT OF THE
VIRGINIA DEPARTMENT OF FORESTRY ON THE

Dry Hydrant Plan for the Commonwealth of Virginia

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 8

COMMONWEALTH OF VIRGINIA
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Preface

The Dry Hydrant Plan Study was conducted in accordance with House Joint Resolution No. 197 - 1992. The resolution requested the Department of Forestry, in cooperation with the Department of Housing and Community Development, Fire Programs, Transportation, and Conservation and Recreation to develop a plan establishing a statewide network of dry fire hydrant sites.

Study group members were Don T. Morton, Department of Forestry, E. C. Cochran, Jr., Department of Transportation; Jack E. Frye, Department of Conservation and Recreation; Kenneth R. Sharp, Department of Fire Programs; James W. Epperly, Virginia Fire Services Board; L. Willis Miller, Soil Conservation Service; Richard M. Miller, State Fire Chief's Association of Virginia; Jack Finley, Virginia State Firemen's Association; Glenn A. Dean, Department of Housing and Community Development; Ray Dorsett, The Virginia Association of RC & D Councils.

All fire departments in Virginia were contacted and asked to complete a survey of existing hydrants and needed hydrants, as well as fire protection boundaries. Data from 551 fire departments is included in this plan. A need for 3,685 dry hydrant installations is documented.

A matching grant program development committee included Don T. Morton, Department of Forestry, Kenneth Sharp, Department of Fire Programs, Jack Finley, Virginia State Fireman's Association, Richard M. Miller, State Fire Chief's Association of Virginia and John C. Barber, Virginia Association of RC & D Councils.

The Department of Forestry gratefully acknowledges the cooperation and assistance of the study committee members and their agencies, the cooperating fire departments and the Department of Forestry field units and the Fire Branch office services specialist.

Executive Summary

A dry hydrant is a relatively low-cost, non-pressurized pipe system installed in existing lakes, ponds or streams that provides an all-weather, ready means of suction supply of water (See Appendix A). Dry hydrants use raw water rather than processed water from community water sources, and this results in the reduction of energy consumption for the community. A system of dry hydrants increases the availability of water and reduces the time for fire departments to load water for fire suppression. The level of fire protection may be increased to the point that homeowners and businesses pay less in fire insurance premiums. The cost of a dry hydrant installation varies from $1,500 to $2,500.

All fire departments in the Commonwealth were asked to complete a hydrant survey questionnaire. Five hundred seventy-four (574) primary departments were included. Five hundred fifty-one (551) fire departments furnished data.

A total of 292 dry hydrants are presently in place throughout Virginia. A need for 3,685 additional dry hydrants was found. These locations are plotted on maps of each fire department protection area. The results of the survey are listed in Appendix B. Data from individual fire departments is on file at the Department of Forestry office in Charlottesville.

Dry hydrants are needed in urban, urbanizing and rural areas. Urban and urbanizing areas have the need to reduce the large volume of processed domestic water used in fire control and to protect annexed areas which do not have pressurized hydrants. Rural areas have few readily accessible water sources for fire control.

The study committee recommends that the General Assembly appropriate $150,000 from the oil overcharge funds for fiscal year '93-'94 to allow the installation of additional dry hydrants across the Commonwealth. A dry hydrant grant program has been established which is administered by the Department of Forestry. The $150,000 appropriated in the 1992 session will be used for grants prior to June 30, 1993. An evaluation of the program will be made to determine needed levels of funding from the next biennum budget.

Dry Hydrant Study

Dry hydrants are relatively low cost, non-pressurized pipe systems installed in existing lakes, ponds or streams that provide a ready means of suction supply of water for fire departments (See Appendix A).

Few dry hydrants exist in the Commonwealth. Dry hydrants are needed in urban, urbanizing and rural areas. In urban and urbanizing areas, dry hydrants can reduce the large volumes of processed domestic water used in fire control and increase the protection of annexed areas without pressurized hydrants. Rural areas have few readily accessible water sources.

Resource Conservation and Development Councils in Virginia have recognized the need for dry hydrants and funding to install them. The Eastern Shore RC&D, as well as the New River Highlands RC&D, have made local studies and secured very limited funding to assist rural volunteer fire departments in the installation of a few dry hydrants. Two newer Councils, Old Dominion and Tidewater, are also promoting dry hydrant installation. Together the four Councils represent 33 counties.

The Virginia Association of RC&D Councils in cooperation with the Virginia Department of Forestry submitted a proposal to the 1992 Session of the General Assembly of Virginia requesting funding for dry hydrant projects. Two actions resulted from this proposal. The General Assembly passed House Joint Resolution No. 197 and appropriated $150,000 in oil overcharge funds for demonstration projects.

House Joint Resolution No. 197 requested the Department of Forestry, in cooperation with the Departments of Housing and Community Development, Fire Programs, Transportation, and Conservation and Recreation to develop a plan establishing a network of dry fire hydrant sites. The State Forester appointed a study committee.

A survey questionnaire was developed and approved by the committee. Local maps and the survey questionnaire were used in contacting all fire departments recognized by the Department of Fire Programs to collect data on existing and needed dry hydrants. Most fire departments were contacted directly by Department of Forestry field personnel. The larger urban fire departments were contacted by mail. Five hundred fifty-one (96%) of the 574 fire departments furnished data. Each fire protection area and the location of existing and needed dry hydrants was plotted on locality maps. The maps and survey forms are on file at the Department of Forestry Headquarters.

Tabulation of the survey forms shows a total of 292 existing dry hydrants and the need for 3,685 dry hydrants. County and city data are in Appendix B.

Dry Hydrant Demonstration Program

A grant proposal to the U.S. Department of Energy has been submitted through the Virginia Department of Mines, Minerals and Energy to secure the $150,000 in oil overcharge funds designated for the dry hydrant demonstration grant program by the 1992 Virginia Acts of the Assembly, Chapter 893, paragraph 119E.

A matching grant program for reimbursement of partial costs for hardware, excavation, installation and all-weather access for each demonstration dry hydrant has been developed and approved by the Demonstration Dry Hydrant Committee.

The reimbursement will be for documented expenses not to exceed $1,500 per installation. The Department of Forestry will administer the program and provide field assistance in location, layout, design, and final testing of demonstration dry hydrant projects. Based on the findings in this study the committee recommends that the General Assembly appropriate $150,000 dollars from the oil overcharge funds for fiscal year '93-'94 to allow the installation of dry hydrants across the Commonwealth. The $150,000 appropriated in the 1992 session will be utilized for grants prior to June 30, 1993.

Dry Hydrant Justification

Fire departments must be prepared to deliver large volumes of water to fire incidents. Much of this water is delivered in fire pumper trucks and tank trucks in rural areas. Nearby availability of a water supply is critical to the protection of life, property, and natural resources as well as the conservation of fuel used to power trucks for water shuttles to the fire incident.

Studies have shown that the typical one-way distance fire tank trucks must travel to fill up points in rural and urbanizing areas is 12 miles. An average of four trucks respond to fire calls. Each truck uses approximately one gallon of fuel for each four miles driven.

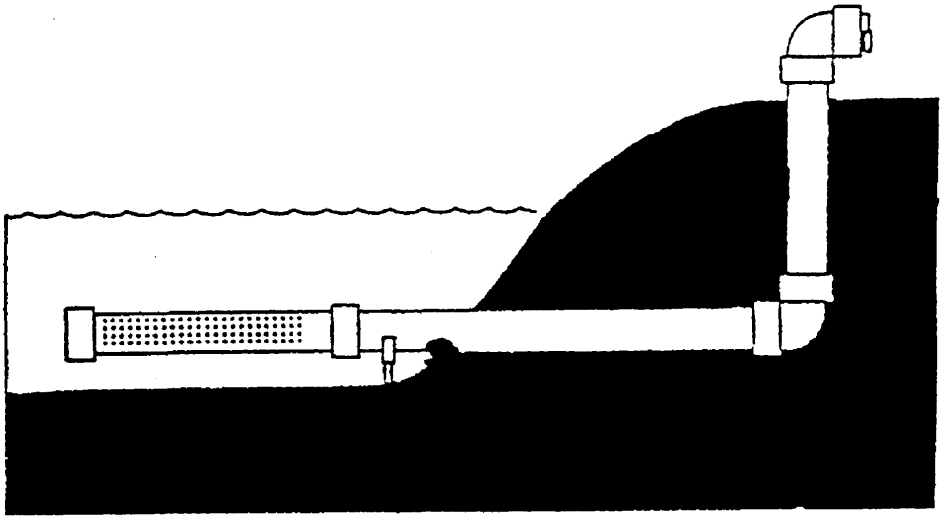
A dry hydrant system can reduce fuel consumption by 50 to 60 percent. This reduction will be achieved by shorter hauls and the lessened need for water. Initial attack with shorter turnaround times will allow more effective initial fire attack and thus save structures and other property. The reduced loss in property will ultimately result in energy conservation since replacement materials will not be needed. Insurance premium reduction may also result.

The limiting factor for fire departments installing dry hydrants is the cost of materials and the lack of funds to obtain the necessary equipment to install them. The average cost of materials is $600 per hydrant. Other variable costs range from $1,000 to $2,000. These costs include equipment, labor, gravel, culvert pipe, etc.

Appendix A

DRY HYDRANT

An Alternative Water Source for Fire Protection



WHAT'S A DRY HYDRANT?

Dry hydrants are non-pressurized pipe systems installed in existing lakes, ponds and streams that provide a ready means of suction supply of water for fire departments.

WHY WOULD ANYONE WANT A DRY HYDRANT?

Dry hydrants provide a ready supply of raw water to fire departments for fighting fires. Dry hydrants reduce the time required to fill tanker trucks and the amount of equipment and men required to fight fires.

GENERAL INFORMATION -

Dry hydrants can increase the use of natural or man-made water sources by reducing the time and manpower requirements for direct draft sites. Although the drafting technique is the same, dry hydrants result in faster response time. The construction of a dry hydrant, combined with proper access creates a totally usable hydrant site that will allow fire equipment to draft water for fire fighting. A dry hydrant provides a fixed water path from a water source to a site accessible to a fire truck.

Contact your local
Department of Forestry Office
For More Information

VIRGINIA DEPARTMENT OF FORESTRY

Appendix B

Dry Hydrant Survey Data Statewide

Data Summary

Fire Departments Surveyed	574
Fire Departments Furnishing Data	551 (96%)
Present Pressurized Hydrants	59,646
Present Dry Hydrants	292
Needed Pressurized Hydrants	7,295
Needed Dry Hydrants	3,685

NOTE: Survey data legend

Pp = Present Pressurized Hydrants
Pd = Present Dry Hydrants
Np = Needed Pressurized Hydrants
Nd = Needed Dry Hydrants

	Total	Pp	Pd	Np	Nd
Accomack	13	0	16	0	37
Albemarle	8	1300	4	0	59
Alexandria - City	1	2600	0	0	0
Alleghany	7	18	3	0	37
Amelia	5	0	1	1	62
Amherst	3	517	0	40	10
Appomattox	2	86	2	0	0
Augusta	14	571	0	0	40
Bath	3	158	0	0	18
Bath & Highland	2	0	0	0	16
Bedford	10	446	1	50	107
Bland	5	10	2	14	71
Botetourt	6	119	0	51	62
Brunswick	7	213	0	14	31
Buchanan	8	150	0	10	98
Buckingham	4	50	0	2	23
Buena Vista	1	0	0	0	0
Campbell	8	652	3	46	16
Caroline	6	45	0	23	31
Carroll	4	394	9	5	17
Charles City	1	34	0	30	30
Charlotte	7	106	2	7	40
Charlottesville - City	1	984	0	0	0
Cheapeake - City	1	42	1	0	7
Chesterfield	1	6300	1	1500	10
Clarke	3	106	0	88	30
Clarke/Warren	1	0	0	0	6
Clifton Forge	1	0	0	0	0
Craig	5	45	1	10	19
Culpeper	5	286	0	0	44
Cumberland	2	1	4	0	18
Danville - City	1	1718	0	0	0
Dickenson	4	112	1	150	37
Dinwiddie	6	61	1	65	27
Essex	1	58	1	20	1
Fairfax	1	0	0	0	21
Fauquier	7	346	3	37	45
Floyd	4	97	3	0	34
Fluvanna	4	150	0	0	19
Franklin	11	510	3	76	72
Frederick	10	671	6	915	97
Fredericksburg - City	1	737	0	40	4
Giles	8	262	3	25	42
Gloucester	2	398	2	0	9
Goochland	6	25	8	0	58
Grayson	6	462	7	50	28
Greene	3	112	4	50	45
Greensville	1	247	3	0	2
Grundy	1	150	0	20	15
Halifax	12	589	2	0	80
Hampton - City	1	2551	0	6	0
Hanover	12	0	18	0	11

	Total	Pp	Pd	Np	Nd
Henrico	1	7000	0	0	4
Henry	7	688	3	1700	64
Highland	2	52	0	0	8
Highland & Bath	1	0	0	0	4
Isle of Wight	5	1	1	0	58
James City	1	1500	0	0	0
King and Queen	4	1	0	0	18
King George	1	50	0	0	6
King William	1	1	0	0	29
Lancaster	3	3	1	1	12
Lee	10	232	0	0	54
Lexington	1	0	0	0	0
Loudoun	13	0	10	0	41
Louisa	6	8	2	0	59
Lunenburg	3	201	0	0	18
Lynchburg - City	1	2100	0	0	1
Madison	1	0	1	0	17
Mathews	1	0	0	0	5
Mecklenburg	8	772	1	0	71
Middlesex	4	20	1	0	13
Montgomery	5	1074	2	95	12
Nelson	7	307	3	0	20
New Kent	1	77	1	100	23
Newport News - City	1	3529	1	0	4
Northampton	5	0	9	0	15
Northumberland	2	3	5	1	14
Norton-City	1	250	0	0	0
Nottoway	3	345	1	10	10
Orange	5	210	9	20	44
Page	3	282	1	10	53
Patrick	9	50	6	0	50
Pittsylvania	13	190	6	50	50
Poquoson - City	1	272	0	0	0
Powhatan	4	35	21	0	42
Prince Edward	5	0	4	16	37
Prince George	5	197	2	0	21
Prince William	7	966	0	0	37
Pulaski	8	821	3	166	20
Rappahannock	6	6	2	0	50
Richmond	1	70	2	0	5
Roanoke	11	0	2	0	44
Rockbridge	9	145	3	5	39
Rockingham	8	732	5	76	64
Russell	7	258	10	181	142
Scott	7	315	0	53	263
Shenandoah	11	357	0	44	52
Smyth	7	352	0	0	24
Southampton	9	170	6	55	73
Spotsylvania	2	0	4	0	35
Stafford	7	0	14	0	13
Staunton - City	1	528	0	40	3
Suffolk	5	577	2	200	26

	Total	Pp	Pd	Np	Nd
Surry	3	97	0	0	18
Sussex	5	0	0	0	27
Tazewell	8	25	2	12	54
Tazewell/Smyth	1	0	0	0	13
Virginia Beach - City	1	6431	6	0	14
Warren	7	361	14	610	36
Washington	10	102	0	63	32
Waynesboro	1	800	0	0	1
Westmoreland	4	167	10	421	62
Williamsburg	1	800	0	0	4
Wise	6	350	0	0	0
Wythe	6	387	1	21	47
York	1	890	0	0	24
State Total	551	59646	292	7295	3685

Appendix C

GENERAL ASSEMBLY OF VIRGINIA--1992 SESSION

HOUSE JOINT RESOLUTION NO. 197

Requesting the Department of Forestry, in cooperation with the Departments of Housing and Community Development, Fire Programs, Transportation, and Conservation and Recreation to develop a plan establishing a network of dry fire hydrant sites.

Agreed to by the House of Delegates, February 9, 1992
Agreed to by the Senate, March 4, 1992

WHEREAS, a dry hydrant is a nonpressurized pipe system that is installed in an existing lake, pond, or stream to provide an easily accessible source of year-round water for a tanker truck through suction; and

WHEREAS, a system of dry fire hydrants could improve fire protection, conserve fuel and water, and save money; and

WHEREAS, the tankers of 19 local volunteer fire companies on the Eastern Shore traveled approximately 11,457 miles in 1989; and

WHEREAS, installation of 75 dry fire hydrants would result in an annual savings of 4,812 miles; and

WHEREAS, with installation of dry fire hydrants, homeowners and property owners would receive improved fire protection that would reduce loss of life and property in rural fires; and

WHEREAS, the general public would have a potential reduction in their fire insurance premiums and also receive the benefit of the fuel savings and increased efficiency of the operations of the volunteer fire companies; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Department of Forestry, in cooperation with the Departments of Housing and Community Development, Fire Programs, Transportation, and Conservation and Recreation, is hereby requested to develop a plan establishing a network of dry fire hydrant sites in the Commonwealth. The plan shall include, at a minimum, (i) general information regarding local fire departments, (ii) county maps identifying locations for proposed dry fire hydrants and existing hydrants and (iii) site plans for each hydrant. The plan will also contain procedures to assist local efforts in securing funding and technical guidance.

All agencies of the Commonwealth shall cooperate with the departments and assist them in the performance of their duties. Localities are encouraged to provide assistance in any manner helpful to the departments in carrying out their charge.

The Department of Forestry shall report its findings and recommendations and plan to the Governor and the 1993 Session of the General Assembly in accordance with the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.