

Date: March 25, 2002
To: DDW Staff
Through: Robert B. Taylor, P.E., Director
Division of Drinking Water
From: Source Water Assessment Program TEAM
Subject: Water – Procedure – Surveillance – Source Water Assessment Program
Implementation Manual

Delete Working Memo 836

The subject Implementation Manual originally transmitted via Working Memo 836 has been revised and the revised version is included herewith. As previously stated, source water assessments of existing and new sources must follow these guidelines.

Corrections have been made to the checklist (Appendix N). A reduction in number of copies to be mailed out (LHD and Local library don't receive a copy of SWAR).

An additional explanation has been added to (Chart A) under High category (Groundwater source construction is unknown or inadequate).

/teh
Enclosure

Source Water Assessment Program Implementation Manual

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15.01 General

The purpose of the Virginia Source Water Assessment Program (SWAP) (Appendix 15O) is to identify potential sources of contamination (PSCs) which are inventoried in available State, Federal and private databases [as defined in Appendix 15U], local land use activities (LUAs) and potential conduits to groundwater (PCs) which could impact public water supplies (both groundwater and surface water) and present a threat to public health. Susceptibility of the water supply source(s) to PSCs, LUAs and PCs will be evaluated during the assessment. A report will be prepared for each waterworks. The report will include a map showing the proximity of the PSCs, LUAs, and PCs to the source(s) of water, and a list of property owners and addresses for each identified PSC, LUA, and PC. A goal of the reports is to encourage waterworks owners to develop Source Water Protection Programs (SWPPs).

Division of Drinking Water (DDW) personnel will devote the time and manpower necessary to conduct the assessments. Field Directors may redistribute the assessments within their respective Field Offices in order to equalize the work load and assure the assessments for all waterworks are completed by April 30, 2003 (this is a different date than that stated in Section IX of the SWAP due to EPA delay in approval of the SWAP necessitating a later start in beginning the assessments). Field Directors will be expected to address this effort in their annual work plans as sanitary survey schedules may require modification in order to complete the assessments.

15.02 Background

Section 1453 of the 1996 Amendments to the Safe Drinking Water Act (SDWA) requires each State to develop a SWAP that will:

- “delineate the boundaries of the assessment areas in such State from which one or more public water systems in the State receive supplies of drinking water, using all reasonably available hydrogeologic information on the sources of supply of drinking water in the State and the water flow, recharge, and discharge and any other reliable information as the State deems necessary to adequately determine such areas; and
- identify the contaminants regulated under this title for which monitoring is required under this title (or any unregulated contaminants selected by the State, in its discretion, which the State, for the purposes of this subsection, has determined may present a threat to public health), to the extent practical, the origins within each delineated area of such contaminants to determine the susceptibility of the public water systems in the delineated area to such contaminants.”

In addition, “The State shall make the results of the source water assessments conducted under this subsection available to the public.”

15.03 Resources

In addition to field surveys, the following may provide valuable information for the source water assessment:

- Data developed in completing the Groundwater Under Direct Influence of Surface Water (GWUDISW) assessments;
- Data compiled to evaluate applications for waivers to Phase II/V monitoring;
- Data from sanitary surveys of waterworks conducted by VDH personnel and/or consultants;
- Results from bacteriological and chemical monitoring programs; and
- Evaluation of a waterworks’ compliance with Virginia’s design and construction requirements
- Selected state, Federal and private databases of potential sources of contamination.

15.04 Definitions: See SWAP Appendix A. The definitions of some terms were modified for clarity during the preparation of this manual. See Appendix 15S for the clarified definitions.

15.05 Source Assessment Areas

15.05.01 Groundwater

- Zone 1: 1000 foot fixed radius – inventory LUAs listed in SWAP Appendix F Tables 1 and 2 and PSCs and potential conduits to groundwater listed in SWAP Appendix F Table 3
- Zone 2: 1 mile fixed radius – identify PSCs

15.05.02.01 Groundwater under surface influence

15.05.02.02 No identified flowing surface source

- Zone 1: 1000 foot fixed radius – inventory LUAs listed in SWAP Appendix F Tables 1 and 2 and PSCs and potential conduits to groundwater listed in SWAP Appendix F Table 3
- Zone 2: 1 mile fixed radius – identify PSCs

15.05.02.03 Identified flowing surface source

- Zone 1: 1000 foot fixed radius – inventory LUAs listed in SWAP Appendix F Tables 1 and 2 and PSCs and potential conduits to groundwater listed in Table 3
- Zone 2: the watershed upgradient from the well (limited only by topographic boundaries or state lines) - identify PSCs

15.05.03 Surface Water15.05.03.01 Non-tidal source intakes or pumped storage project intakes

- Distance upgradient from intake (limited only by topographic boundaries or state lines)
- Zone 1: watershed bounded by a 5 mile radius – inventory LUAs listed in SWAP Appendix F Tables 1 and 2 and PSCs
- Zone 2: watershed beyond the 5 mile radius - identify PSCs

15.05.03.02 Tidal source intakes

- Distance upgradient and down gradient from intake (limited only by topographic boundaries or state lines)
- Zone 1: watershed bounded by a 5 mile radius – inventory LUAs in SWAP Appendix F Tables 1 and 2 and PSCs
- Zone 2: watershed beyond the 5 mile radius - identify PSCs

15.05.03.03 Impoundment intakes

- Distance from intake (limited only by topographic boundaries or state lines)
- Zone 1: watershed bounded by a 5 mile radius – inventory LUAs in SWAP Appendix F Tables 1 and 2 and PSCs
- Zone 2: watershed beyond the 5 mile radius - identify PSCs

15.06 Inventories of Land Use Activities of Concern and Potential Conduits to Groundwater

VDH staff will complete an inventory of LUAs and PCs (where applicable) that are present within the Zone 1 source water assessment area. Central Office staff will pre-identify some LUAs in **Form D (Potential Sources of Contamination in Zones 1 and 2 Form)**. VDH staff will identify those LUAs listed in SWAP Appendix F Tables 1 or 2 and other obvious possible sources of contamination during site visits and from information gathered from the waterworks owner/operator and other sources. VDH staff will identify PCs listed in SWAP Appendix F Table 3 for groundwater sources. (Evaluators may identify 'other obvious possible sources of contamination' and shall discuss these with their supervisor prior to including in the inventory.)

VDH will use the inventory of LUAs and PSCs in Zone 1 in the susceptibility determination for each surface source. VDH will use the inventory of LUAs and PCs in Zone 1 and PSCs in Zones 1 and 2 in the susceptibility determination for each groundwater source. Therefore, the inventories are an integral part of the overall susceptibility determination and the related usefulness of the source water assessment for the waterworks owner and the public.

15.06.01 - Reference Mapping

For each water source, the DDW Central Office will provide GIS generated maps with the source location and Zone 1 and/or Zone 2 assessment area(s) plotted thereon. A preliminary step in the preparation of the GIS maps for surface sources is the 'drawing' of the watershed boundaries influencing the source by field office engineers. The field office engineers in this task will use the Maptech software program Terrain Navigator. The appropriate Technical Service Engineer or Environmental Health Manager will distribute the maps to the evaluator. The locations of PSCs that are listed with longitude/latitude coordinates in readily available databases shall be noted on these maps. These may include VPDES discharges, landfills, RCRA sites, Superfund sites, underground storage tanks, underground injection wells, hazardous waste sites, military bases, open dumps, tire piles, pesticide/herbicide manufacturers, petroleum tank farms, and releases investigated by DEQ. Sites utilizing Best Management Practices (BMP) will also be shown in Zone 1 and 2. BMPs are used as tools to identify LUAs that will be listed on Form C. The evaluator shall confirm the accuracy of the Zone 1 and Zone 2 boundaries.

15.06.02 Compiling the Inventories for Groundwater Sources

The following is a suggested sequence that field staff should consider following in making the LUA and PC inventories for each source. Any additions or alterations, which fit the circumstances for a particular system, are up to the field staff and their management.

- a. Obtain two Zone 1 and one Zone 2 maps, **Form D** and **Best Management Practice Documentation Form (Form G)** from the appropriate Technical Service Engineer or Environmental Health Manager.
- b. Send form letter describing the assessment task and requesting assistance in performing the assessment and land use inventory (Appendix 15H, for groundwater sources) to the owner of the waterworks. Enclose a copy of the Zone 1 map, **Zone 1 Land Use Activity Inventory Field Form (Form C)**, **Form D**, **Potential Conduits To Groundwater Inventory Form (Form F)** and applicable SWAP Appendix F Tables 1 or 2 and 3. Attempt to secure the attendance of the owner and/or operator during the field inventory. The owner/operator could have property owner and other valid site, LUA, PSC or PC knowledge, which would assist in the inventory.
- c. Depending on the situation, obtain a copy of the tax map(s) that contain the source and properties within the Zone 1 assessment area. Use of tax maps for identification of properties containing LUAs, PSCs and/or PCs should be viewed as a last resort. The assessor will determine if it is necessary to have tax maps prior to conducting the field survey.
- d. Take copies of the maps, SWAP Appendix F LUA Inventory Tables 1-3, **Form C**, **Form D**, **Form F**, **Form G** and other related information to the field.
- e. Confirm the Zone 1 boundaries and the PSC sites in Zone 1 on the maps. Confirmation of PSC data may be by a field visit (see item h. below), personal knowledge of its existence, confirmation by another party such as the waterworks owner, waterworks operator, emergency services coordinator, extension agent or other reliable contact. When using another party for confirmation purposes, determine if that party is sure the PSC exists, is sure the PSC does not exist, or does not know. (If the party does not know, further investigation by the evaluator is required.)
- f. Compile a listing of the LUAs present in the Zone 1 assessment area on **Form C**. Evaluators shall identify the LUAs in SWAP Appendix F Table 1 for community and nontransient noncommunity waterworks. Evaluators shall identify the LUAs in SWAP Appendix F Table 2 for transient noncommunity waterworks. Assign each LUA an Identification Number, starting with L-1 and progressing as additional LUAs are identified. Do not duplicate the listing when a LUA is already assigned a PSC number.
- g. Compile a listing of the PCs present in the Zone 1 assessment area on **Form F**. Evaluators shall identify each PC in SWAP Appendix F Table 3. Assign each PC an Identification Number starting with C-1 and progressing as additional PCs are identified. **Form F** will become a part of the assessment report. The PC "Ponds, streams" means **non-intermittent streams**. For areas of numerous (i.e. more than 10), Other Wells in Use, outline the general area containing the points by placing a 'cross-hatched' area on the map. Next, assign the general area one PC ID#, and list the type of PC in the general area on Form F (using the same PC ID# on separate lines).
- h. The only field observation required is from the source location and public access. Care must be taken to avoid any right of entry or trespass problems.
- i. Adjacent property owner and local emergency management personnel contacts may be a benefit and can be utilized as deemed necessary.
- j. Locate the LUA on the field map. Map the LUA by placing a 'dot' on the map. This can be done by approximately locating and noting the LUA ID # on the field map. For areas of farmland that have the same risk ranking, the evaluator may 'cross-hatch' the entire area as a block, assign the block one LUA ID#, and identify the name and address of each landowner in the block on **Form C** (using the same LUA ID# on separate lines). For areas of numerous (ie. more than 10), On-site Sewage Systems and Fuel Storage Systems, outline the general area containing the points by placing a 'cross-hatched' area on the map. Next, assign the general area one LUA ID#, and list the name and address of each landowner in the general area on **Form C** (using the same LUA ID# on separate lines). For on-site sewage systems and for residential fuel storage systems identified efforts to obtain names and addresses will be limited to requesting the waterworks owners to provide them from the billing records, etc. Indicate on **Form C** if names and addresses could not be obtained.

- k. There may be several LUA IDs located and noted for the same location on the Field Form and field map. (Ex: A service station may have fuel storage tanks {L-1} and a drainfield {L-2} present at the same map location.)
- l. One major effort in this portion of the assessment is to determine the name and mailing address of property owners, and sometimes the land parcel boundaries, for all land use activities noted in the Zone 1 mapped area. The identity of property owners can be obtained from several different sources and will vary depending upon the local resources available. Much of the effort in this area can be done by the waterworks owner, in-office record searches, telephone contacts, and visits to local government offices. Field contacts at the time of the inventory should be utilized as much as possible. See the last sentence in paragraph j above.

The following is a list of potential (not all-inclusive) sources to research and obtain the property owner name and mailing address information for noted LUAs:

- PWS owners/operators (such individuals usually have knowledge of adjacent property owners)
 - PWS billing records
 - Owners in the Zone 1 area (owners can be contacted by phone or visit if necessary)
 - City/County Clerk Land Use Records at the local courthouse
 - City/County Tax Maps and related records
 - City/County/Planning District Geographic Information System Files
 - 911 Address Locations
 - City/County Planning and Zoning Office records
 - City/ County Building Official records
 - Local Health Department/DDW records
 - Harris (or similar) Virginia Industrial Directory
- m. Attempt to verify the property owner name and mailing address information for LUAs, PSCs and PCs prior to inclusion on the final field form and final map documentation.
 - n. The SWAP requires, when possible, that VDH staff identifies the Best Management Practices (BMP) and lack of care in operation and general housekeeping practices used at the land use activity site. VDH staff will rely on a database provided by the Department of Conservation and Recreation (DCR) and the fact that BMPs are now integral to permitted facilities. The DCR database covers many BMPs utilized in agriculture (see Appendix T). An initial **Best Management Practice Documentation Form (Form G)** will be provided as noted in item a. For Zone 1 note any other information on BMPs or inappropriate operation of BMPs or housekeeping on the form. Permitted LUAs listed in Tables 1 and 2, in general, have, by nature of obtaining a permit, installed the applicable BMP and therefore only inappropriate operation or housekeeping should be documented. For LUAs that may not fall into these two categories (DCR inventory or permitted) note obvious BMPs or inappropriate operation and housekeeping that you observe. The final form shall become a portion of the assessment report.
 - o. Add the risk information (see SWAP Appendix F Tables 1 & 2) for the LUAs to **Form C**. This can be done in the field or office. **For those PSCs and LUAs that appear in SWAP Appendix F Tables 1 and 2, use the risk type assigned in the Tables.** For those that do not appear in SWAP Appendix F Tables 1 and 2, use professional judgement in assigning a risk type utilizing the following guidelines:
 - assign a 'high' risk to those that contain contaminants that could be expected to produce 'acute' (currently microbiological and nitrate) PMCL violations
 - assign a 'medium risk' to those that contain contaminants that could be expected to produce 'non-acute' PMCL violations
 - assign a "low risk" to those that contain contaminants that would not be expected to produce a PMCL violation.
 - reduce the risk type if the chance of release and/or the chance of transport to the water source are considered low.
 Obtain the concurrence of your supervisor for the assignment of the risk type.

- p. Upon return to the office, determine which information on **Form C** is valid, important and should be included in the final report and line through all unnecessary information. **Form C** is not a part of the final report, but is utilized to write the report and rank the risks. Enter a date of verification in the column named 'Verified' if the evaluator has determined that contaminant(s) are used or stored at the LUA.
- q. Send one copy of the marked up Zone 1 field map and **Forms C, D and F** to DDW Central Office for inclusion in a GIS layer. Keep at least one additional copy in the office for back-up purposes. The DDW Central Office will provide four copies of the updated Zone 1 map, four copies of the updated Zone 2 map, **Form E, E2**, and an updated **Form D and F** back to the field staff for inclusion in the final report. Transfer of map data shall be through the Field Office Technical Service Engineer. (The four maps are for distribution with assessment reports to the waterworks owner, county official (not mandatory), Field Office and DDW Central Office.)

15.06.03 Compiling the Inventories for Surface Sources

The following is a suggested sequence that field staff should consider following in making the LUA inventory for each source. Any additions or alterations, which fit the circumstances for a particular system, are up to the field staff and their management.

- a. Delineate the watershed boundary affecting the source location by using the tools of the Terrain Navigator program. Terrain Navigator, by Maptech is a software program of topographical maps with the capability to import and export information. A database of the hydrologic units of Virginia has been obtained. The hydrologic units are grouped by river basins with sub-units conforming to local watersheds. The sub-units have been converted to electronic files with *.txf extensions (track file). The sub-units, along with a second electronic file with a *.mxf extension (marker file) will be sent to the field office TSE upon request. The second file will contain the location of the surface water source locations (usually an intake). The field office engineer will import both files into the Terrain Navigator program. The engineer will then delineate the watershed boundary affecting the source location by using the tools of the Terrain Navigator program. The *.txf file(s) created in the delineation will be exported from the program for the TSE to forward to the Source Water Administrator. Zone 1 and Zone 2 maps will be generated from this information.
- b. The Central Office staff will send five copies of the Zone 1 and one copy of the Zone 2 map with PSCs located thereon to the TSE for continuation of the assessment process.
- c. The assessor will obtain five Zone 1 and one Zone 2 maps, **Form D** and **Best Management Practice Documentation Form (Form G)** from the appropriate Technical Service Engineer.
- d. Send form letters describing the assessment task and requesting assistance in performing the assessment and land use inventory (Appendix 15H, for surface sources) to the owner of the waterworks and the local emergency services coordinator. Enclose a copy of the Zone 1 map, Zone 1 Land Use Activity Inventory Field Form (Form C), Potential Sources of Contamination in Zones 1 and 2 Form (Form D) and applicable SWAP Tables 1 or 2. Attempt to secure the attendance of the owner and/or operator during the field inventory. The owner/operator and local emergency service coordinator could have property owner information and other valid site knowledge, which would assist in the inventory. [In addition, when the source is a groundwater under the direct influence of surface water: use the PC portions of the letter and enclose SWAP Table 3.]
- e. Confirm the Zone 1 and Zone 2 boundaries on the maps provided by the Central Office by reference to USGS quad sheets.
- f. Confirm the PSC data on the Zone 1 maps. Confirmation of PSC data may be by a field visit (see k below), personal knowledge of its existence, confirmation by another party such as the waterworks owner, waterworks operator, emergency services coordinator, or other reliable contact. When using another party for confirmation purposes, determine if that party is sure the PSC exists, is sure the PSC does not exist, or does not know. (If the party does not know, further investigation by the evaluator is required.)
- g. For sources that are classified as Groundwater Under the Direct Influence of Surface Water (GWUDISW) compile a listing of the PCs present in the Zone 1 assessment area on **Form F**. Evaluators shall identify each PC in SWAP Appendix F Table 3. Assign each PC an Identification Number starting with C-1 and progressing as additional PCs are identified. **Form F** will become a part of the assessment report.

- h. The only field observation required is from the source location and public access. Care must be taken to avoid any right of entry or trespass problems.
- i. Locate the LUA or PC on the field map. Locate the LUA by placing a 'cross-hatched' area for farms or a 'dot' for other LUAs and PCs (for GWUDISW only) on the map. This can be done by approximately locating and noting the LUA ID # or PC ID# on the field map. For vast areas of farmland with many owners that have the same risk ranking, the evaluator may cross-hatch the entire area as a block, assign the block one LUA ID#, and identify the name and address of each landowner in the block of Form C (using the same LUA ID# on separate lines)."
- j. There may be several LUA IDs located and noted for the same location on **Form C** and the field map. (Ex: A farm supply store may have fuel storage tanks {L-1} and fertilizer {L-2} present at the same map location.)
- k. See 15.06.02.1
- l. Attempt to verify the property owner name and address information for LUAs, PSCs and PCs before inclusion on the final field form and final map documentation. Verification should help provide a better, more accurate assessment report to the owner and the public.
- m. The SWAP requires, when possible, that VDH staff identifies the Best Management Practices (BMP) and lack of care in operation and general housekeeping practices used at the land use activity site. For BMPs VDH staff will rely on a database provided by the Department of Conservation and Recreation (DCR) and the fact that BMPs are now integral to permitted facilities. The DCR database covers many BMPs utilized in agriculture (see Appendix 15T). An initial **Best Management Practice Documentation Form (Form G)** will be provided listing the DCR BMPs. For Zone 1, note any information on inappropriate operation or housekeeping on the form. The final form shall become a portion of the assessment report.
- n. Add the risk information (see SWAP Appendix F Tables 1 & 2) for the LUA to **Form C**. This can be done in the field or office. **For those PSCs and LUAs that appear in SWAP Appendix F Tables 1 and 2, use the risk type assigned in the Tables.** For those that do not appear in SWAP Appendix F Tables 1 and 2, use professional judgement in assigning a risk type utilizing the following guidelines:
 - assign a 'high' risk to those that contain contaminants that could be expected to produce 'acute' (currently microbiological and nitrate) PMCL violations
 - assign a 'medium risk' to those that contain contaminants that could be expected to produce 'non-acute' PMCL violations
 - assign a "low risk" to those that contain contaminants that would not be expected to produce a PMCL violation.
 - reduce the risk type if the chance of release and/or the chance of transport to the water source and/or the impact on the treatment process is considered to be low

Obtain the concurrence of your supervisor for the assignment of the risk type.

- o. Send one copy of the marked up Zone 1 field map and **Forms C, D and F** to DDW Central Office for inclusion in a GIS layer. Keep at least one additional copy in the office for back-up purposes. The DDW Central Office will provide four copies of the updated Zone 1 map, four copies of the updated Zone 2 map and **Form E, E2**, and an updated **Form D and F**, back to the field staff for inclusion in the final report. Transfer of map data shall be through the Field Office Technical Service Engineer. (The four maps are for distribution with assessment reports to the waterworks owner, county official (not mandatory), Field Office and DDW Central Office.)

15.06.04 Land Use Activity for Agriculture

Inventorying the LUAs listed under Agriculture in SWAP Appendix F Tables 1 and 2 may be complicated by the fact that most 'farms' have a combination of activities, i.e. chemical/fuel storage, crop/fodder production, pasture (grazing), confined animal feeding operations (CAFO), etc. Focus on the portion of the farm that is located in Zone 1. The assessor may discover non-permitted CAFO's during the field survey.

15.08 Source Water Assessment Report

Appendix 15I is the template to be used to prepare the Source Water Assessment Report (SWAR). The report template has been prepared such that information from the assessment can be inserted in the designated blanks and pertinent wording choices can be left in or deleted as needed. Wording choices throughout the report template are shown in brackets. All non-pertinent information or wording concerning the assessment, the sources, or the waterworks should be deleted. However, Charts A and B should be left as they are. Directions and explanations for completing certain sections of the report are shown on the report template in *italics* and should be deleted after use. The report should be prepared as follows:

- Complete the heading with the appropriate information.
- Edit the first paragraph as needed.
- For each source, list in the table the source name and susceptibility to contamination as determined on the Source Water Susceptibility Determination (Form A), Appendix 15A, completed for each source. Also insert the appropriate explanation(s) for the determination(s) from the bracketed choices in Appendix A of the report. Edit the number of rows on the table as necessary.
- Edit and/or delete the paragraphs under [*choose*] as necessary by filling in the appropriate source name(s) in the blanks where applicable.
- For page 2, include in the table each source name along with its type from the choices in brackets.
- Edit the paragraph immediately under the table as needed.
- Leave-in and/or delete the appropriate assessment area criteria(s) as needed.
- Ensure that all required forms, appendices, and attachments are included with the report by checking the attachments list at the end of the report. Delete the non-applicable checklist items.

15.09 Distributing the Source Water Assessment Report

Appendix 15 J will be used to transmit the SWAR to the owner. The letters are identical with the exception of the signature block. At the top of the page the "Subject:" and "Water:" blanks will be filled in with the heading as it appears on the official file. The owner's address block will include the PWS ID number followed by the waterworks name; owner name and address as officially listed in our records. The body of the letter contains only one blank, which will be used for the name of the office sending the report. The signature block will contain the name of the person sending the report and their office. For the "copies to" block, VDH-DDW will copy the applicable LHD for reports done by VDH-DDW (Appendix 15 J).

Appendix 15 K will be used to inform local government administrators and cooperative extension agents of the availability of the SWAR. The address block will contain the name, address, and title of the administrator or extension agent being contacted. List, the official name(s) of the system(s) for which the SWAR is completed.

Appendix L is a template for a public service announcement, which we will offer to a local newspaper. The last line of the first paragraph contains a blank for the official name of the waterworks. The table for the source water assessment contains three blanks for each source. The table can accommodate any number of sources. The first blank for source name should list each source by the name listed on the description sheet in the official file. The second blank will list the susceptibility to contamination as very low, low, moderate or high as determined from Form A. The third blank is optional for the purpose of providing a brief description of the results.

Appendix M will be used to transmit Appendix L to the local newspaper. The "Subject:" and "Water:" blanks will be filled in with the heading as it appears in the official file. The name and address of the newspaper will be the address to which routine correspondence is sent. The letter will be signed by the VDH-DDW contact person.

15.10 Assessment Updates

In accordance with Section IX. F. of the SWAP, following completion of the initial Source Water Assessment, VDH personnel will continue to identify LUAs within the Zone 1 assessment area during regularly scheduled sanitary surveys. Identifications will be made by personal observation and by asking the waterworks operating personnel to state new LUAs of which they are aware. VDH staff shall identify the LUAs, determine the type of LUA, determine the physical location of the LUA (longitude/latitude or 'dot' on a topographic map), assign a risk factor, and determine the name and mailing address of the owner of the LUA. PART II – SYSTEM SURVEY INFORMATION (Field Notes) of the Groundwater System Sanitary Survey Report has been updated to include this information (Appendix 15T). Substitute the new page for the one currently in use. Amend whatever surface water sanitary survey forms you currently use to include a section similar to that outlined in Appendix 15U. VDH staff shall report this data to the waterworks owner on a form to be attached to the sanitary survey report (Appendix 15V). In order to update the Central Office GIS source water assessment database, the Field Office Technical Services Engineer will transmit the Appendix 15V forms that are attached to the sanitary survey reports to the Source Water Supervisor, who will update the database.

15.11 Outsourced Assessments and Data Collection

DDW has contracted with outside agencies to conduct source water assessments for selected waterworks in the Hampton Roads area, Upper New River Watershed area, Southwest VA area, the City of Roanoke, and the Fairfax County Water Authority. The outside agencies will submit their work to DDW for review and approval or inclusion into the assessment being prepared by DDW. Inasmuch as each contract is different, separate instructions for dealing with the outside agencies will be provided to the respective Field Directors. It may be profitable for DDW and the outside agency if the applicable District Engineer met with the agency during the execution of the contract to coordinate efforts.

DDW has contracted with the United States Geological Survey to identify the natural susceptibility of regional aquifers. The Source Water Supervisor will forward the results of this study to the respective Field Directors if it is completed within the period necessary for DDW to perform the initial assessments.

15.12 Time Accounting, Monthly Reports, R + R, Tracking

All time spent on source water assessment activities, including preparation, field work and report writing and transmittal, will be reported in the category 'sanitary surveys – special' for time accounting purposes. *The activity accounting will be under FIELD INVESTIGATIONS – SPECIAL (not dependent on a' report')*.

An assessment is considered complete when the Source Water Assessment Report has been completed and transmitted to the proper final destinations and notices of its availability have been sent to their proper destinations. At that time, this event is also to be recorded in the R + R database for the waterworks.

One copy of each completed Form A will be transmitted to the DDW Central Office for a susceptibility DataBase.

Appendix 15X contains a form that may be used to track the activities involved in the preparation of each assessment. The data that must be entered is at the discretion of each Field Office Director. An EXCEL spreadsheet will be provided to the Technical Services Engineer at each Field Office. The spreadsheet may be modified at the direction of the Field Director to add or remove columns. Additional modifications to conform to field office conditions, such as listing by county, district, etc. are at the discretion of the Field Director.

LETTER DESCRIBING THE ASSESSMENT TASK AND REQUESTING ASSISTANCE IN PERFORMING THE
ASSESSMENT AND LAND USE INVENTORY [for surface sources]

SUBJECT:
Water –

(DATE)

Dear:

The Virginia Department of Health is about to perform an assessment of the source(s) that serve(s) the subject waterworks. We invite your participation in this effort. We will attempt to exhaustively identify land use activities of concern [LUAs] {and potential conduits to groundwater [PCs]} in the Zone 1 assessment area for each source using field investigations and interviews with persons familiar with the assessment area. . We have enclosed a map of the Zone 1 assessment areas for each source, and (a) table(s) listing examples of the LUAs {and PCs} with which we are concerned. Your staff may assist by placing a ‘dot’ or ‘shaded area’ on the map(s) identifying the location of LUAs {and PCs} of which you are aware and by identifying the LUAs {and PCs}. We also request that a member of your staff who is familiar with the assessment area assist us during our field assessment. We will be calling to establish a date and time for the field assessment.

The assessment also involves identification of potential sources of contamination (PSCs) within the watershed of a surface water source (up to the state boundary line). This data has been obtained from publicly held databases. A copy of the data that has been obtained is enclosed. Please advise us of additions and corrections of which you are aware.

Thank you for your efforts to help with the assessment and provide improved protection of the public water supply.

Sincerely,

Enclosures: Table 1 {or 2}, {Table 3}, Zone 1 assessment area maps, Zone 1 Land Use Activity Inventory Field Form (Form C), Potential Sources of Contamination in Zones 1 and 2 Form (Form D), Potential Conduits to Groundwater Inventory Form (Form F)

c:

Health Department – ATTN:
VDH – Richmond

LETTER DESCRIBING THE ASSESSMENT TASK AND REQUESTING ASSISTANCE IN PERFORMING THE
ASSESSMENT AND LAND USE INVENTORY [for groundwater sources]

SUBJECT:
Water –

(DATE)

Dear:

The Virginia Department of Health is about to perform an assessment of the source(s) that serve(s) the subject waterworks. We invite your participation in this effort. We will attempt to exhaustively identify land use activities of concern [LUAs] and potential conduits to groundwater [PCs] in the Zone 1 assessment area for each source using field investigations and interviews with persons familiar with the assessment area. . We have enclosed maps of the Zone 1 and Zone 2 assessment areas for each source, and (a) table(s) listing examples of the LUAs and PCs with which we are concerned. Your staff may assist by placing a 'dot' or 'shaded area' on the map(s) identifying the location of LUAs and PCs of which you are aware and by identifying the LUAs and PCs. We specifically request that you identify each building in the Zone 1 assessment area that is served by a septic tank/drainfield sewerage system, locate the building on the Zone 1 map and provide the name and address of the owner of the building. We also request that a member of your staff who is familiar with the assessment area assist us during our field assessment. We will be calling to establish a date and time for the field assessment.

The assessment also involves identification of potential sources of contamination (PSCs) within a one-mile radius of a groundwater source. This data has been obtained from publicly held databases. A copy of the data that has been obtained is enclosed. Please advise us of additions and corrections of which you are aware.

Thank you for your efforts to help with the assessment and provide improved protection of the public water supply.

Sincerely,

Enclosures: Table 1 {or 2}, {Table 3}, Zone 1 assessment area maps, Zone 1 Land Use Activity Inventory Field Form (Form C), Potential Sources of Contamination in Zones 1 and 2 Form (Form D), Potential Conduits to Groundwater Inventory Form (Form F)

c:
Health Department – ATTN:
VDH – Richmond

**VIRGINIA DEPARTMENT OF HEALTH
SOURCE WATER ASSESSMENT REPORT**

DATE:

WATERWORKS:

PWSID NO.:

CITY/COUNTY:

TYPE: Community/Non-Transient/Non-Community

OWNER:

For [the] [each] source serving the subject waterworks this report includes, map(s) showing the source water assessment area (divided into Zones 1 and 2 with Zone 1 having greater influence on the source), an inventory of known Land Use Activities of Concern [and Potential Conduits to Groundwater *(delete if no GW sources)*] within the assessment area, a rudimentary determination of its relative susceptibility to contamination, and documentation of any known contamination within the last 5 years *(delete if not applicable)*. [Also included is documentation of Best Management Practices utilized at Land Use Activity sites *(delete if not applicable)*.] Information in this report is provided to aid in efforts toward Source Water Protection.

The Source Water Assessment of the subject waterworks has yielded the following results:

Source Name	Relative Susceptibility to Contamination	Explanation

[For the table state each source, susceptibility determination, and the appropriate explanation(s) from the susceptibility explanation choices on Chart A. Add or delete rows as necessary to match number of sources.]

The criteria utilized for placement into a particular susceptibility class is included on the attached Source Water Susceptibility Determination Form (Form A). Explanations for selection of a susceptibility class are included on Chart A. The susceptibility class is not intended to be a definitive determination. A list of definitions of key terms used in this report is included on Chart B.

[choose]

There are Land Use Activities of Concern, Potential Sources of Contamination [and Potential Conduits to Groundwater] located in Zone 1 for -----[, -----, -----, and -----]. The Land Use Activities and Potential Sources of Contamination sites are shown on the Zone 1 map and inventoried on the attached "Ranking of Land Use Activity and Potential Sources of Contamination in Zone 1 Form (Form E)" for this [these] source[s], ranked in order of greater public health risk. [The Potential Conduits to Groundwater are shown in Zone 1 and inventoried on the "Potential Conduits to Groundwater Inventory Form (Form F)" for this [these] source[s]].

No Land Use Activities of concern, Potential Sources of Contamination [or Potential Conduits to Groundwater] are known to exist in Zone 1 for [the source] [any of the sources] *[or]* [-----, -----, -----, and -----].

There are Potential Sources of Contamination] known to be located in Zone 2 for -----, -----, -----, and -----]. The Potential Sources of Contamination are shown on the Zone 2 map and inventoried on the attached "Potential Sources of Contamination in Zones 1 and 2 Form (Form D)" completed for [this] [these] source[s].

No Land Use Activities of concern, Potential Sources of Contamination [or Potential Conduits to Groundwater] are known to exist in Zone 1 and Zone 2 for [the source] [any of the sources] *[or]* [-----, -----, -----, and -----].

[delete following paragraph if no BMPs]

Best Management Practices Used at Land Use Activity sites in Zone 1 for [-----, -----, -----, and -----] are documented on the attached "Best Management Practice Documentation Form" for [this] [each of these] source[s].

[choose]

There [has] [have] been no known contamination of the source[s] [-----, -----, and -----] within the last 5 years.

[and/or]

A listing of known contamination[s] of [-----, -----, -----, and -----] within the last 5 years is on the attached "List of Known Contamination Documentation Form (based on last 5 years)" for [this] [each of these] source[s].

The source waters for this waterworks have been categorized in accordance with the following table:

[State each source and choose type on the table. Add or delete rows to match number of sources.]

Source Name	Source Water Type
	[Groundwater] [Surface Water with a Non-Tidal Source Intake] [Surface Water with a Tidal Source Intake] [Surface Water with an Impoundment Source Intake] [Groundwater Under the Direct Influence of Surface Water with No Identified Flowing Surface Source] [Groundwater with an Identified Flowing Surface Source]
	[Groundwater] [Surface Water with a Non-Tidal Source Intake] [Surface Water with a Tidal Source Intake] [Surface Water with an Impoundment Source Intake] [Groundwater Under the Direct Influence of Surface Water with No Identified Flowing Surface Source] [Groundwater with an Identified Flowing Surface Source]
	[Groundwater] [Surface Water with a Non-Tidal Source Intake] [Surface Water with a Tidal Source Intake] [Surface Water with an Impoundment Source Intake] [Groundwater Under the Direct Influence of Surface Water with No Identified Flowing Surface Source] [Groundwater with an Identified Flowing Surface Source]

Based on the source type[s], the following assessment area delineation[s] [has] [have] been assigned in accordance with the guidance of the Virginia Source Water Assessment Program and are shown on the attached map(s) prepared for each source:

[delete the non-applicable criteria(s) below]

Groundwater Assessment Area

- Zone 1 = 1000-foot fixed radius surrounding source
- Zone 2 = 1-mile fixed radius surrounding source and outside of Zone 1

Surface Water Assessment Area

For a non-tidal source intake [or pumped storage project intake]

- Zone 1 = Watershed area upgradient and within a 5-mile fixed radius of the raw water intake
- Zone 2 = Total watershed area upgradient of the raw water intake and outside of Zone 1

For a tidal source intake

- Zone 1 = Watershed area upgradient and down gradient and within a 5-mile fixed radius of the raw water intake
- Zone 2 = Total watershed area upgradient and down gradient of the raw water intake and outside of Zone 1

Page 2

SUBJECT:
Water -

For an impoundment source intake

- Zone 1 = Watershed area within a 5-mile fixed radius of the raw water intake
- Zone 2 = Total watershed area outside of Zone 1

Groundwater Under the Direct Influence of Surface Water

With no identified flowing surface source

- Zone 1 = 1000-foot fixed radius surrounding source
- Zone 2 = 1-mile fixed radius surrounding the source and outside of Zone 1

With identified flowing surface source

- Zone 1 = 1000-foot fixed radius surrounding source
- Zone 2 = Total watershed area upgradient of the source and outside of Zone 1

The following attachments are part of this report (one for each source):

- Assessment Area Map(s)
- Source Water Susceptibility Determination Form (Form A)
- Known Contamination Documentation Form (Form B)
- Potential Sources of Contamination in Zones 1 and 2 Form (Form D)
- Ranking of Land Use Activity and Potential Sources of Contamination In Zone 1 Form (Form E)
- Area Features Documentation Form (Form E2)
- Potential Conduits to Groundwater Inventory Form (Form F) *(delete if SW sources only)*
- Best Management Practice Documentation Form (Form G) *(delete if not applicable)*
- Chart A (Susceptibility Explanations)
- Chart B (Key Definitions)

Chart A
Susceptibility Classes

Susceptibility	Explanation
Very low	[choose] [Properly constructed groundwater source located in an area that tends to inhibit contaminant migration, is protected with an appropriate aquitard, and has had no known detection of contamination within the last 5 years] [or] [Properly constructed groundwater source located in an area that tends to promote contaminant migration (or provide little protection against contaminant migration), but determined by the U. S. Geological Survey to be developed in a ‘confined’ or ‘nonsensitive’ aquifer within that groundwater area] with no land use activities of concern or potential conduits to groundwater in the Zone 1 assessment area nor potential sources of contamination in the Zone 1 or Zone 2 assessment areas
Low	[choose] [Properly constructed groundwater source located in an area that tends to inhibit contaminant migration, is protected with an appropriate aquitard, and has had no known detection of contamination within the last 5 years] [or] [Properly constructed groundwater source located in an area that tends to promote contaminant migration (or provide little protection against contaminant migration), but determined by the U. S. Geological Survey to be developed in a ‘confined’ or ‘nonsensitive’ aquifer within that groundwater area] with [choose] [land use activities of concern][and][potential conduits to groundwater] in the Zone 1 assessment area][potential sources of contamination in the Zone 1 or Zone 2 assessment areas]
Moderate	[choose] [Groundwater source constructed in an area that tends to promote migration of contaminants] [or] [Groundwater source located in an area that tends to inhibit contaminant migration but unprotected by an appropriate aquitard] [or] [Groundwater source located in an area that tends to inhibit contaminant migration in which contaminants have been detected within the past five years] with no land use activities of concern or potential conduits to groundwater in the Zone 1 assessment area nor potential sources of contamination in the Zone 1 or Zone 2 assessment areas
High	[choose] [Groundwater source constructed in an area that tends to promote migration of contaminants] [or] [Groundwater source construction is unknown or inadequate] [or] [Groundwater source located in an area that tends to inhibit contaminant migration but is unprotected by an appropriate aquitard] [or] [Groundwater source located in an area that tends to inhibit contaminant migration in which contaminants have been detected within the past five years] with [choose] [land use activities of concern][and][potential conduits to groundwater] in the Zone 1 assessment area [and/or potential sources of contamination in the Zone 1 or Zone 2 assessment areas]
Moderate	[choose] [Surface water] [or] [Groundwater under the direct influence of surface water source] exposed to an inconsistent array of contaminants at varying concentrations due to changing hydrologic, hydraulic and atmospheric conditions with no land use activities of concern in the Zone 1 assessment area
High	[choose] [Surface water] [or] [Groundwater under the direct influence of surface water source] exposed to an inconsistent array of contaminants at varying concentrations due to changing hydrologic, hydraulic and atmospheric conditions with land use activities of concern in the Zone 1 assessment area

Chart B: Definitions of Key Terms

Aquifer:	A water bearing geological unit that will yield water to wells or springs.
Aquitard:	An underground confining bed of earthen material that retards, but does not prevent, the flow of water between adjacent aquifers.
Best Management Practices:	Practices utilized by the owner and/or operator of land use activities in attempts to reduce or eliminate contamination of the environment.
Community Waterworks:	A waterworks which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
Confined or Nonsensitive Aquifer:	An aquifer that is bounded by impervious confining layers both at the top and the bottom. Also referred to as an artesian aquifer
Delineation:	The process of defining or mapping a boundary that approximates the areas that contribute water to a particular water source used as a public water supply. For surface waters, the land area usually consists of the watershed for a reservoir or stream. For groundwater sources, the boundary typically approximates the surface area that contributes water to the aquifer.
Groundwater:	Water that is beneath the ground and that does not meet the definition of surface water.
Groundwater Under the Direct Influence of Surface Water:	A groundwater with (i) significant occurrence of insects, microorganisms, algae, or pathogens, or (ii) significant and relatively rapid shifts in water characteristics which closely correlate to climatological or surface water conditions. The Virginia Department of Health designates a groundwater source meeting certain conditions as a Groundwater Under the Direct Influence of Surface Water in accordance with 12 VAC 5-590-430 of the <i>Waterworks Regulations</i> .
Identified Flowing Surface Source	A surface water stream that enters the groundwater by flowing into a sinkhole, leaking through the bottom of a stream bed, or by other means and which has been verified through tracer or other studies to reemerge from the ground as a spring or through a well; or which flows beneath broken rubble (which is strewn down the side of a mountain) with openings to the atmosphere and which is collected at a 'springbox'
Impoundment Source Intake:	A raw water intake that feeds from a surface water consisting of a reservoir or other type of impoundment.
Land Use Activity:	An activity that stores, uses, or produces chemicals or biological pathogens and that have the potential to release such contaminants within the source water assessment area.
Non-Community Waterworks:	A waterworks that is not a community waterworks but serves any 25 or more persons for 60 or more days per year.
Non-Tidal Source Intake:	A raw water intake that feeds from surface water that is not influenced by tidal action and possesses a stream flow, which travels downgradient.
Non-Transient Non-Community Waterworks:	A waterworks that is not a community waterworks but that regularly serves at least 25 of the same persons for 6 months or more per year.

Chart B: Definitions of Key Terms

Page 2

Potential Conduits to Groundwater:	A fracture, sinkhole, drilled hole, well or any type of conduit through the ground that has the potential to carry surface water or surface runoff directly into a groundwater.
Potential Sources of Contamination:	A land use activity whose presence and location have been identified in selected state, federal, or private databases during the assessment.
Raw Water Intake:	The suction intake that draws water from a surface water source for use as a public water supply.
Sensitivity:	The relative ease, with which a contaminant applied near the land surface, or to the subsurface, can migrate to the delineated source water area.
Source Water Assessment:	An assessment to provide information on the potential contaminant threats to the water source(s) of a waterworks and the susceptibility of those sources to contamination.
Surface Water:	Water open to atmosphere and subject to receiving surface runoff.
Susceptibility to Contamination:	The determined classification (or rating) of the susceptibility of a source to contamination based on its sensitivity and the presence of land use activities of concern, potential sources of contamination, or potential conduits to groundwater (for groundwater sources only) within the assessment area. This classification is not intended to be definitive.
Tidal Source Intake:	A raw water intake that feeds from a surface water that is influenced by tidal action resulting in a stream flow that travels in either direction based on the rise or fall of moon or wind driven tides.
Upgradient:	The directions from a source in which ground elevation rises with distance. Opposite is downgradient. Water will flow downgradient.
Watershed:	A topographical area that is within a line drawn connecting the highest points uphill of a drinking water intake from which overland flow drains to a water supply intake.

Letter from DDW to Owner Transmitting Source Water Assessment Report

Subject: _____ County/City
Water: (system name)

Source Water Assessment

PWS ID #
System Name
Owner Name
Address

Dear Waterworks Owner:

The _____ Field Office of the Virginia Department of Health, Division of Drinking Water has completed a Source Water Assessment for your waterworks. Attached you will find a copy of the assessment. Please take a few minutes to look over your copy. The availability of the Source Water Assessment Report is the first step in assisting in the preparation of a Source Water Protection Program (SWPP). The Virginia Department of Health is available to provide technical assistance to waterworks in developing a SWPP for your waterworks, please contact me if you have any questions concerning this assessment. Please note that the susceptibility class(es) assigned is relative and not intended to be a definitive determination(s).

The following information from the Source Water Assessment must be included in the next and subsequent Consumer Confidence Report issued by the waterworks with a brief summary of the susceptibility to contamination of each drinking water source.

Sincerely,

District Engineer
_____ Field Office

c: _____ Health Department

Letter To County Administrator, City Administrator, Etc. Informing Of Existence Of Source Water Assessment Report And
Where To Obtain One

Name & Address
Town/County/City Administrator
Cooperative extension agent

Dear _____:

The Virginia Department of Health (VDH), in response to Section 1453 of the 1996 Amendments to the Safe Drinking Water Act (SDWA), has been conducting Source Water Assessments for each public water system in Virginia. Source Water Assessments have been completed for the following systems: _____. This/These report(s) is/are available by contacting the waterworks.

Sincerely,

DDW-FO

Subject: _____
Water - _____

(date)

PUBLIC SERVICE ANNOUNCEMENT

The Virginia Department of Health (VDH), in response to Section 1453 of the 1996 Amendments to the Safe Drinking Water Act (SDWA), has been conducting Source Water Assessments for each waterworks in Virginia. The purpose is to identify land use activities of concern, determine the relative susceptibility of the source(s) to activities that may exist and to assist the waterworks owner in the preparation of a Source Water Protection Program. A Source Water Assessment has been completed for the _____ waterworks.

The Source Water Assessment for this waterworks has yielded the following results:

Source Name	Relative Susceptibility to Contamination	Explanation

The Source Water Assessment Report is the first step in assisting in the preparation of a Source Water Protection Program (SWPP). VDH is available to provide technical assistance to waterworks in developing a SWPP.

Letter to Newspaper Transmitting Source Water Assessment Report Public Service Announcement

Subject: _____ County/City
Water: _____

(DATE)

Name & Address
for Newspaper

Dear _____:

Enclosed you will find an announcement of the availability of a Source Water Assessment Report for the (name of waterworks). This announcement may be published as a community service, if you so desire. No state funds are available to advertise these announcements. Please call me if you have any questions.

Sincerely,

District Engineer
_____ Field Office

cc: _____ Health Department_ATTN: Dr. _____
VDH - Richmond

SOURCE WATER ASSESSMENT PROGRAM -
CHECKLIST FOR THE DISTRIBUTION OF THE COMPLETED ASSESSMENT REPORT

Waterworks Name: _____

1. Waterworks Owner:

- _____ A. Original copy of the letter to the owner transmitting the Source Water Assessment Report
 - _____ B. Copy of the Source Water Assessment Report (Appendix 15I)
 - _____ C. Copies of the following attachments (**one for each source**):
 - _____ 1. Assessment Area Map(s)
 - _____ 2. Source Water Susceptibility Determination Form (Form A)
 - _____ 3. Known Contamination Documentation Form (Form B)
 - _____ 4. Potential Sources of Contamination in Zones 1 and 2 (Form D)
 - _____ 5. Ranking of Land Use Activities and Potential Sources of Contamination in Zone 1 (Form E)
 - _____ 6. Area Features Documentation Form (Form E2) – **If applicable**
 - _____ 7. Potential Conduits to Groundwater Inventory Form (Form F) – **Groundwater Sources Only**
 - _____ 8. Best Management Practice Documentation Form (Form G) – **If applicable**
 - _____ 9. Susceptibility Explanations (Appendix A)
 - _____ 10. Key Definitions (Appendix B)
-

2. Local Health Department

- _____ A. Copy of the letter to the owner transmitting the Source Water Assessment Report
-

3. County Administrator/City Manager/Town Manager, etc.

- _____ A. Original copy of the letter to the County Administrator/City Manager/Town Manager, etc. informing him/her of the existence of the Source Water Assessment Report (App. 15K)
-

4. Local Newspaper

- _____ A. Original copy of the letter to the newspaper transmitting the Source Water Assessment Program Public Service Announcement (Appendix 15L)
 - _____ B. Original copy of the Public Service Announcement (Appendix 15M)
-

5. Division of Drinking Water - Richmond

- _____ A. Yellow copy of the letter to the Owner transmitting the Source Water Assessment Report (Appendix 15J)
- _____ B. Copy of the Source Water Assessment Report (Appendix 15I)
- _____ C. Copies of the following attachments (**one for each source**):
 - _____ 1. Assessment Area Map(s)
 - _____ 2. Source Water Susceptibility Determination Form (Form A)
 - _____ 3. Known Contamination Documentation Form (Form B)
 - _____ 4. Potential Sources of Contamination in Zones 1 and 2 (Form D)
 - _____ 5. Ranking of Land Use Activities and Potential Sources of Contamination in Zone 1 (Form E)
 - _____ 6. Area Features Documentation Form (Form E2) – **If applicable**
 - _____ 7. Potential Conduits to Groundwater Inventory Form (Form F) – **Groundwater Sources Only**
 - _____ 8. Best Management Practice Documentation Form (Form G) – **If applicable**
 - _____ 9. Susceptibility Explanations (Appendix A)
 - _____ 10. Key Definitions (Appendix B)
- _____ D. Yellow copy of the letter to the County Administrator/City Manager/Town Manager, etc. (Appendix 15K)
- _____ E. Yellow copy of the letter to the local newspaper transmitting the Public Service Announcement (App. 15L)
- _____ F. Yellow copy of the Public Service Announcement (Appendix 15M)

**SOURCE WATER ASSESSMENT PROGRAM
CHECKLIST FOR THE DISTRIBUTION OF THE ASSESSMENT REPORT**

Waterworks Name: _____

6. Division of Drinking Water – _____ Field Office

- _____ A. Yellow copy of the letter to the Owner transmitting the Source Water Assessment Report (Appendix 15J)
- _____ B. Copy of the Source Water Assessment Report (Appendix 15I)
- _____ C. Copies of the following attachments (**one for each source**):
 - _____ 1. Assessment Area Map(s)
 - _____ 2. Source Water Susceptibility Determination Form (Form A)
 - _____ 3. Known Contamination Documentation Form (Form B)
 - _____ 4. Potential Sources of Contamination in Zones 1 and 2 (Form D)
 - _____ 5. Ranking of Land Use Activities and Potential Sources of Contamination in Zone 1 (Form E)
 - _____ 6. Area Features Documentation Form (Form E2) – **If applicable**
 - _____ 7. Potential Conduits to Groundwater Inventory Form (Form F) – **Groundwater Sources Only**
 - _____ 8. Best Management Practice Documentation Form (Form G) – **If applicable**
 - _____ 9. Susceptibility Explanations (Appendix A)
 - _____ 10. Key Definitions (Appendix B)
- _____ D. Yellow copy of the letter to the County Administrator/City Manager/Town Manager, etc. (Appendix 15K)
- _____ E. Yellow copy of the letter to the local newspaper transmitting the Public Service Announcement (App. 15L)
- _____ F. Yellow copy of the Public Service Announcement (Appendix 15M)

Dated Initials: _____

Virginia Source Water Assessment Program [SWAP]

DEFINITIONS

Delineation (delineate)	The process of defining or mapping a boundary that approximates the areas that contribute water to a particular water source used as a public water supply. For surface waters, the land area usually consists of the watershed for a reservoir or stream. For groundwater sources, the boundary typically approximates the surface area that contributes water to the aquifer.
Identified Flowing Surface Source	A surface water stream that enters the groundwater by flowing into a sinkhole, leaking through the bottom of a stream bed, or by other means and which has been verified through tracer or other studies to reemerge from the ground as a spring or through a well; or which flows beneath broken rubble (which is strewn down the side of a mountain) with openings to the atmosphere and which is collected at a 'springbox'.
Land Use Activity (LUA) Inventory	A list of activities that store, use, or produce chemicals or biological pathogens, and that have the potential to release such contaminants (contaminants with MCLs plus any others a state considers a health threat) within a source water assessment area
Potential Source of Contamination (PSC)	A land use activity whose presence and location are identified in selected state, Federal, or private databases. The databases utilized in the SWAP are listed in Appendix 15U.
Sensitivity	The relative ease by which a contaminant applied near the land surface, or to the subsurface, or to a body of water can migrate to the source of water for a waterworks.
Source Water Assessment	An assessment that provides information on the potential contaminant threats to surface and ground water sources that are used to supply waterworks. Each source water assessment consists of a delineation of the source water assessment area, an inventory of land use activities, and a determination of the susceptibility of the water source to contamination.
Source Water Assessment Area	The land area around a waterworks' source delineated as part of the state SWAP
Susceptibility	The relative ease with which a contaminant applied near the land surface can migrate to the aquifer of interest under a given set of land use practices and hydrogeologic sensitivity characteristics (land use and sensitivity).
Susceptibility Determination	An analysis to determine, with a clear understanding of where the land use activities are located, the susceptibility of the waterworks in the source water assessment area to contamination from these activities.

Virginia Agricultural BMPs

Practice Number	Practice Name
FR-1	Reforestation of Erodible Crop and Pastureland
FR-3	Woodland Buffer Filter Area
FR-4	Woodland Erosion Stabilization
SE-1	Vegetative Stabilization of Marsh Fringe Areas
SE-2	Shoreline Stabilization
SL-1	Permanent Vegetative Cover on Cropland
SL-1W	Permanent Vegetative Cover on Cropland Wildlife Option
LS-3	Stripcropping Systems
SL-3B	Buffer Stripcropping
SL-3W	Buffer Stripcropping/Wildlife Option
SL-4	Terrace System
SL-5	Diversion
SL-6	Grazing Land Protection
SL-6B	Alternative Water System
SL-8	Protective Cover for Specialty Crops
SL-8B	Small Grain Cover Crop for Nutrient Management
SL-11	Permanent Vegetative Cover on Critical Areas
SI-11B	Farm Road or Heavy Traffic Animal Travel Lane Stabilization
WL-1	Field Borders/Wildlife Option
WL-2	Idle Land/Wildlife Option
WL-3	Fescue Conversion/Wildlife Option
WP-1	Sediment Retention, Erosion or Water Control Structures
WP-2	Stream Protection
WP-2A	Streambank Stabilization
WP-2B	Stream Crossings & Hardened Access

Practice Number	Practice Name
WP-2C	Stream Channel Stabilization
WP-2W	Vegetation Establishment for Stream Protection/Wildlife Option
WP-3	Sod Waterway
WP-4	Animal Waste Control Facility
WP-4B	Loafing Lot Management System
WP-4C	Composter Facility
WP-4D	Soil Test in Support of Nutrient Management Plan
WP-4E	Animal Waste Structure Pumping Equipment
WP-5	Stormwater Retention Pond
WP-6	Agricultural Chemical & Fertilizer Handling Facility
WP-7	Surface Water Runoff Impoundment for Water Quality
WP-8	Relocation of Confined Feeding Operations From Environmental Sensitive Areas
WQ-1	Grass Filter Strips
WQ-1W	Filter Strips/Wildlife Option
WQ-4	Legume Cover Crop
WQ-5	Water Table Control Structure
WQ-6	Constructed Wetlands
WQ-6B	Wetland Restoration
WQ-7	Plasticulture Irrigation Water Recycling System
WQ-8	Fuel Storage Treatment
WQ-9	Capping/Plugging of Abandoned Wells
WQ-10	Integrated Pest Management

Databases Used to Determine Potential Sources of Contamination

Type of Data	Type of Source	Data Provider
Superfund Sites	Ground and Surface	EPA
NPDES waste discharges	Ground and Surface	VEDP, DEQ
No-discharge facilities (sewage lagoons, etc)	Ground and Surface	VEDP, DEQ
Open solid waste disposal facilities	Ground and Surface	VEDP
RCRA sites	Ground and Surface	DEQ
Hazardous waste sites	Ground and Surface	DEQ
Tire piles	Ground and Surface	CBLAD
Industrial Sites	Ground and Surface	Harris Info Services
Petroleum Tank Farms	Ground and Surface	VEDP, DEQ
Storm Water Permits	Ground and Surface	DEQ
Golf courses	Ground and Surface	ESRI DATA, VEDP
Hospitals	Ground and Surface	VEDP
Highways	Ground and Surface	VDOT
Rail lines	Ground and Surface	VDOT
Confined Feeding Operations (CAFO)	Ground and Surface	DEQ
Agricultural and Pasture Land	Ground and Surface	DCR, NRCS, DACS
Military Bases	Ground and Surface	VEDP, VDOT
Commercial and general aviation airports	Ground and Surface	VEDP
Leaking Underground Storage Tanks	Ground	DEQ
Underground Injection Wells	Ground	EPA
Sites Investigated by DEQ for groundwater complaint/contamination investigation	Ground	DEQ
Inactive waterworks wells	Ground	SDWIS
Marinas	Surface	VDH Marina Program

Appendix 15T

Revised Groundwater System Sanitary Survey Report Part II
System Survey Information (Field Notes)
Addressing identification of new LUAs
on next page

Water - _____

PART II - SYSTEM SURVEY INFORMATION (Field Notes)

A. Source		C. Storage Pneumatic		E. Storage – Atmospheric	
Sanitary Casing Seal		Protected Drain		Protected Drain	
Screened Casing Vent		Pressure Gauge		Screened Overflow	
12" Casing Extension		Sight Glass		Locked Hatch(es)	
Concrete Pad (6' Square)		Pressurizing system		No sed. /Floating Debris	
Well Lot		Vacuum Relief		Lot Condition Adequate	
Protected from Flooding		Pressure Relief		Screened Vent	
Discharge Check Valve		Exterior Condition		Water Level Indicator	
Discharge Shut-off Valve		Normal Pump Cycling		Access Ladder(s)	
Valved Blow-Off		DL&I Exp. Date(>120 gal.)		All-Weather Access	
Raw Water Sampling Tap		<u>D. Disinfection</u>		Exterior Condition	
Drawdown Gauge		Disinfectant (Circle One)	OCL / Cl ₂	Interior Condition	
Entry Point Tap Available		Feeder Condition		Date Last Drained & Insp.	
Operable Water Meter		Spare Feeder/Repair Parts		<u>F. Booster Pump(s)</u>	
All-Weather Access		Safety Features/Precautions		No. Provided/Operable	
Pitless Adapter		Room Ventilation		Shut-off each suction line	
Pump Controlled By		Contact Tank Provided		Shut-Off & Check Valves on each discharge Line	
Pumping Rate Obsv. (gpm)		30 minute contact time		Pressure Gauge on Discharge Line	
Discharge Head (psi)		Contact tank condition		Compound Gauge on Suction Line	
<u>B. Well House</u>		Injection line condition		Low Pressure Cut-Off	
Proper Storage Only		Solution tank condition		Low Pressure Cut-Off Setting	
No Cross-connections		Solution tank covered		<u>Pump Controls</u>	
Lighting		Feeder		<u>G. Meter Vault</u>	
Heating		Weighing scale		Drain	
Electrical Wiring (safety)		Visible scale in feed equip.		Sample Tap	
Floor Drain		Number full cylinders		Access (Ladder, etc.)	
All-Weather Access		Booster Pump(s)		Locked Access	
Wellhead Accessible		Residual test equipment		Meter Bypass	
Locked		Field test free residual, mg/l			
Clean/Uncluttered		Field test ≈ MOR residuals			

Source Water Assessment Update				
List land use activities of concern found but not listed in Zone 1 for the original source water assessment.				
LUA TYPE	RISK	NAME OF PROPERTY OWNER	OWNER ADDRESS	LATITUDE/LONGITUDE

Notes:

1. Explanations may be listed below or on an additional page(s).
2. Additional areas the inspector should assess include other treatment processes/equipment, overall system operation, maintenance, administration, operator qualifications, training needs, previous consumer complaints, vulnerability (potential contamination), etc.

Deficiencies/Comments: _____

Addition to Surface Water Sanitary Survey Reports Addressing identification of new LUAs

B. SOURCE WATER PROTECTION

1. Does the waterworks have a written source water protection plan? () Yes () No

If "Yes":

Has the source water protection plan been submitted to VDH-DDW for review? () Yes () No

Frequency for conducting watershed evaluations: _____

When was the last evaluation performed? _____

Performed by: _____

Has there been sufficient development in the watershed to warrant a revised source water protection plan? () Yes () No

Discuss:

If "No":

What is nature of watershed?

- () agricultural _____ %
- () industrial _____ %
- () forested _____ %
- () residential _____ %

What is size of the watershed: _____

Percent of watershed protected/controlled: _____

How is the watershed controlled/protected?

- () ordinances () owned by waterworks
- () zoning () other _____

2. Identify any new land use activities of concern or potential sources of contamination in zone 1 as defined in your source water assessment:

3. For any new LUA's determine the type, location (latitude/longitude), assign a risk factor and determine the name and mailing address of the owner of the LUA.

Attachment to final sanitary survey reports for identifying new LUAs

SUBJECT:
Water _

(DATE)

ATTENTION WATERWORKS OWNER

SOURCE WATER ASSESSMENT REPORT UPDATE

The information listed below is an update to the Source Water Assessment Report prepared by this office for your waterworks. The information is about Land Use Activities (LUA's) found during the recent sanitary survey conducted by this office. These LUA(s) were not identified in the Source Water Assessment Report. Add this information to your report and use for source water protection efforts.

Water Source Name:				
LUA TYPE	RISK	NAME OF PROPERTY OWNER	OWNER ADDRESS	LATITUDE/LONGITUDE

Water Source Name:				
LUA TYPE	RISK	NAME OF PROPERTY OWNER	OWNER ADDRESS	LATITUDE/LONGITUDE

Cooperative Extension Offices

Office	Phone	Office	Phone
Accomack	757-787-1361	Lee	540-346-1522
Albermarle	804-984-0727	Loudoun	703-777-0373
Alexandria	703-519-3325	Louisa	540-967-3422
Alleghany	540-962-0276	Lunenburg	804-676-2497
Amelia	804-561-2481	Lynchburg	804-847-1585
Amherst	804-946-9365	Madison	540-948-6881
Appomattox	804-352-8244	Matthews	804-725-7196
Arlington	703-358-6400	Mecklenburg	804-738-6191
Augusta	540-245-5750	Middlesex	804-758-4120
Bath	540-839-7261	Montgomery	540-382-5790
Bedford	540-586-7675	Nelson	804-263-4035
Bland	540-688-3542	New Kent	804-966-9645
Botetourt	540-473-8260	Newport News	757-591-4838
Brunswick	804-848-2151	Norfolk	757-683-2816
Buchanan	540-935-6583	Northampton	757-414-0731
Buckingham	804-969-4261	Northumberland	804-580-5694
Campbell	804-332-9538	Nottoway	804-645-9315
Caroline	804-633-6550	Orange	540-672-1361
Carroll	540-728-7611	Page	540-743-5794
Charles City	804-829-9241	Patrick	540-694-3989
Charlotte	804-542-5884	Petersburg	804-733-1880
Chesapeake	757-382-6348	Pittsylvania.	804-432-7770
Chesterfield	804-751-4401	Powhatan	804-598-5640
Clarke	540-955-5164	Prince Ed	804-392-4246
Craig	540-864-5812	Prince Geo.	804-733-2686
Culpeper	540-727-3435	Prince Wm.	703-792-6289
Cumberland	804-492-4390	Pulaski	540-980-7761
Danville	804-799-6558	Rappahannock.	540-675-3619
Dickenson	540-926-4605	Richmond	804-333-3420
Dinwiddie	804-469-4514	Rich. City	804-786-4150
Essex	804-443-3551	Roanoke	540-772-7524
Fairfax	703-324-5369	Rockbridge	540-463-4734
Fauquier	540-341-7950	Rockingham	540-564-3080
Floyd	540-745-9307	Russell	540-889-8056
Fluvanna	804-589-8122	Scott	540-386-7574
Franklin	540-483-5161	Shenandoah	540-459-6140
Frederick	540-665-5699	Smyth	540-783-5176
Giles	540-921-3455	Southampton.	804-653-2572
Gloucester	804-693-2602	Spotsylvania.	540-582-7096
Goochland	804-556-5341	Stafford	540-899-4020
Grayson	540-773-2491	Suffolk	757-925-6409
Greene	804-985-5236	Surry	757-294-5215
Greensville	804-348-4223	Sussex	804-246-5511
Halifax	804-476-2147	Tazewell	540-988-0405
Hampton	757-727-1401	Va. Beach	757-427-4769
Hanover	804-752-4310	Warren	540-635-4549
Henrico	804-672-5160	Washington	540-676-6309
Henry	540-634-4650	Westmoreland.	804-493-8924
Highland	540-468-2225	Wise	540-328-3699
Isle of Wight	757-365-6257	Wythe	540-223-6040
James City	757-566-1367	York	757-890-3730
King George	540-775-3062		
King. & Queen.	804-785-2962		
King William	804-769-4955		
Lancaster	804-462-5780		

