

DATE: March 25, 2002; Revised July 21, 2004, **December 15, 2004**

TO: Field Office Staff, Office of Drinking Water

THROUGH: Gerald W. Peaks, P.E., Office Director  
Office of Drinking Water

FROM: Source Water Assessment Program TEAM

SUBJECT: Water – Procedure – Surveillance – Source Water Assessment Program  
Implementation Manual

Summary Statement: The subject Implementation Manual originally transmitted March 25, 2002 has been revised and the revised version is included herewith. **Source water assessments of existing and new sources must follow these guidelines after this revised date. Changes have been made to this working memo to better address the SWAR results with source water protection efforts.**

REVISIONS:

Many sections have been revised. **The latest revisions are shown in Bold.**

Review of SWAP showed that some areas may have been incorrectly assessed. In response to comments made by staff, waterworks', and county officials, modifications have been made in SWAP procedures. These modifications only concern ground water sources. Form A has been modified. . **Form A2 has been modified to add a title, "Ground Water Coastal Plain Source Water Susceptibility Determination Form"**. New procedures to be performed before completing either Form A or A2 due to new information from USGS Aquifer Susceptibility Study has been added. These new procedures could result in a lowering of the susceptibility determination originally issued using the previous procedures **for sources located in the Coast Plain Physiographic Province.**

**Form B has new language about Uranium Contamination. Revisions have been made to Appendix 15K.**

A change in notification to the local media has also been made (**see Appendix 15L**). Two original appendices have been combined and the language has been altered. This was made at the advice of our PR personnel.

**Revisions or modifications to be included in the sanitary surveys based on SWAP for ground water and surface water sources have been made. See Appendix 15Q, R, and S.**

All forms have been updated and will be made available for use to each field office via the ODWSHARE Drive at Hank/**COMMITTEES/SWAP**.

It is important to use these new forms and any other changed procedures in this WM to ensure a correct SWAR is produced.

## Source Water Assessment Program Implementation Manual

- 15.01 General
  - 15.02 Background
  - 15.03 Resources
  - 15.04 Definitions
  - 15.05 Source Assessment Areas
  - 15.06 Inventories of Land Use Activities of Concern and Potential Conduits to Groundwater
  - 15.07 Determining the Sensitivity and Susceptibility of the Source
  - 15.08 Source Water Assessment Report
  - 15.09 Distributing the Source Water Assessment Report
  - 15.10 Assessment Updates
  - 15.11 Outsourced Assessments and Data Collection
  - 15.12 Time accounting, monthly reports, R + R, Tracking
- 
- Appendix 15A-1 Source Water Susceptibility Determination Form (Form A)
  - Appendix 15A-2 **Ground Water Coastal Plain** Source Water Susceptibility Determination Form (Form A2)
  - Appendix 15B Known Contamination Documentation Form (Form B)
  - Appendix 15C Zone 1 Land Use Activity Inventory Field Form (Form C)
  - Appendix 15D Potential Sources of Contamination Form (Form D)
  - Appendix 15E-1 Ranking of Land Use Activity and Potential Sources of Contamination Form (Form E)
  - Appendix 15E-2 Area Features Documentation Form (Form E2)
  - Appendix 15F Potential Conduits to Groundwater Inventory Form (Form F)
  - Appendix 15G Best Management Practice Documentation Form (Form G)
  - Appendix 15H-1 Letter Describing the Assessment Task and Requesting Assistance in Performing the Assessment and Land Use Inventory (Surface Sources)
  - Appendix 15H-2 Letter Describing The Assessment Task and Requesting Assistance In Performing the Assessment and Land Use Inventory (Ground Water Sources)
  - Appendix 15I Source Water Assessment Report
  - Appendix 15J Letter from ODW to Owner Transmitting Source Water Assessment Report
  - Appendix 15K Letter To County Administrator, City Administrator, Etc. Informing Of Existence Of Source Water Assessment Report
  - Appendix 15L Request for Media to Make a Voluntary PSA Stating Results of SWARs
  - Appendix 15M Source Water Assessment Program - Checklist For The Distribution Of The Completed Assessment Report
  - Appendix 15N DCR Agricultural Best Management Practices
  - Appendix 15O Databases Used to Determine Potential Sources of Contamination
  - Appendix 15P Transmittal and Request Forms for Transferring Maps between TSEs and CO
  - Appendix 15Q Revised Ground Water System Sanitary Survey Report Part II – System Survey Information (Field Notes) – Addressing **Protection Efforts and Changes to Previous Results of Source Water Assessment Inventory**
  - Appendix 15R Addition to Surface Water Sanitary Survey Reports **Protection Efforts and Changes to Previous Results of Source Water Assessment Inventory**
  - Appendix 15S Attachment to Final Sanitary Survey Reports for Identifying New LUAs
  - Appendix 15T Form to Track Assessment Events

15.01

## General

The purpose of the Virginia Source Water Assessment Program (SWAP) is to identify potential sources of contamination (PSCs) which are inventoried in available State, Federal and private databases [as defined in Appendix 15O], 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).

Field Directors will be expected to address this effort in their annual work plans as sanitary survey schedules may require modification in order to include the assessments. Source Water Assessment Reports (SWARs) are to be completed only once, unless otherwise directed by the U.S. EPA, Central Office, or in response to significant changes of a waterworks sources, source quality, **or LUA/PSC/PC inventory of which would result in a lowering or increasing of the susceptibility rating.** A change in existing waterworks' ownership should be addressed by providing the new owner a **photo** copy of the original SWAR.

### 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 (GUDIS) 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 **VA SWAP document**, 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 Ground Water

- 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 Ground Water under surface influence (GUDIS)

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 ground water 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 Water

15.05.03.01 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 Ground Water

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 VA SWAP document 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 ground water 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 ODW 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 the **Special Projects Engineer**. Once these maps are received, the Technical Service Engineer 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 Ground Water 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. Two determinations must be made before proceeding further. One is whether the source is a GUDIS. The other determination is the location of the source with respect to the Physiographic Provinces of Virginia.

If the source is a GUDIS or located in an area other than the “Coastal Plain Physiographic Province” you will proceed with step a. **under 15.06.02.01** below. Determine this by referring to the (1985) Ground Water Map of Virginia prepared by the Virginia Water Control Board. The “Fall Zone Ground Water Area” is not to be considered the “Coastal Plain”. Assistance can also be provided by the **Special Projects Engineer** for verification of sources in question.

If the source is located in the “Coastal Plain Physiographic Province” obtain a blank copy of Form A2. Complete Form A2 through Step 8. If the source is determined to be sensitive you will proceed with step a. **under 15.06.02.01** below. If the source is determined to be not sensitive, you are not required to perform an inventory for LUAs or **verify any** PSCs. You are only required to perform an inventory for **these select** PCs (Other Wells in Use and Abandoned Wells) **Use procedures outlined in 15.06.02.02**

##### **15.06.02.01 Sensitive Source**

- 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.
- b. Send form letter describing the assessment task and requesting assistance in performing the assessment and land use inventory (Appendix 15H, for ground water 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). **Don't complete field listed as "Estimated Distance from Well". This field will be automatically calculated in the Central Office by the SWAP GIS.**
- 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 by writing the words "not found".
- 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.)

1. 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/ODW records
  - Harris (or similar) Virginia Industrial Directory
- m. Attempt to verify the property owner name and mailing address information for LUAs **and** PSCs 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 15N). 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 A, A2, C, D and F to the Central Office for inclusion in a GIS layer. Keep at least one additional copy in the office for back-up purposes. The Central Office will provide five copies of the updated Zone 1 map, five 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 five maps are for distribution with assessment reports to the waterworks owner, waterworks operator, county official (not mandatory), Field Office and Central Office.)

#### **15.06.02.02 Not Sensitive Source**

- 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.**
- b. **Send form letter describing the assessment task and requesting assistance in performing the assessment (Appendix 15H, for ground water sources) to the owner of the waterworks. Enclose a copy of the Zone 1 map, Potential Conduits To Groundwater Inventory Form (Form F) and applicable SWAP Appendix F–(Table 3). Attempt to secure the attendance of the owner and/or operator during the field inventory. The owner/operator could have PC knowledge, which would assist in the inventory.**
- c. **Take copies of the maps, SWAP Appendix F LUA Inventory Table 3, Form F, Form G and other related information to the field.**
- d. **Confirm the Zone 1 boundaries on the maps.**
- e. **Compile a listing of the “Other Wells in Use” and “Abandoned Wells” present in the Zone 1 assessment area on Form F. Evaluators shall identify these selected PCs from SWAP Appendix F Table 3. Assign each PC an Identification Number starting with C-1 and progressing as additional PCs are identified. Don’t complete field listed as “Estimated Distance from Well”. This field will be automatically generated in the Central Office SWAP GIS. Upon return to the office, determine which information on Form F is valid, important and should be included in the final report and line through all unnecessary information. Form F will become a part of the assessment report.**
- f. **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.**
- g. **Adjacent property owner and local emergency management personnel contacts may be a benefit and can be utilized as deemed necessary.**
- r. **Send one copy of the marked up Zone 1 field map and Forms A2 and F to the Central Office for inclusion in a GIS layer. Keep at least one additional copy in the office for back-up purposes.**

- s. **The Central Office will provide five copies of the updated Zone 1 map, five copies of the updated Zone 2 map, and Form 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 five maps are for distribution with assessment reports to the waterworks owner, waterworks operator, county official (not mandatory), Field Office and 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. Notify **Special Projects Engineer** of existence of new source. Verify coordinates have been entered into SDWIS. **Special Projects Engineer** will delineate source water assessment area utilizing GIS in Central Office.
- b. The Central Office will send four 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 four 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 Manager. Use this web link to find the correct Local Emergency Manager for your area <http://www.vaemergency.com/library/emlist.cfm>. 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 Appendix F-(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 ground water under the direct influence of surface water: use the PC portions of the letter and enclose SWAP Appendix F-(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. See 15.06.02.01.e
- g. For sources that are classified as Ground Water Under the Direct Influence of Surface Water (GUDIS) 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 GUDIS 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. See 15.06.02.01.k
- k. See 15.06.02.01.l
- l. See 15.06.02.01.m
- m. See 15.06.02.01.n
- n. See 15.06.02.01.o
- o. See 15.06.02.01.q

#### 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.

‘Non-permitted confined animal feeding operations, for the purpose of source water assessments, are animal feeding operations where there is concern that significant waste pollutants may enter State waters and where the following conditions are met:

25 or more large animals (pigs, horses, cows, etc.) have been, are or will be stabled or confined and fed or maintained a total of 45 days or more in any 12 month period; and crops, vegetation forage growth or post harvest residues are not sustained over any portion of the lot or facility.’

#### 15.07 Determining the Sensitivity and Susceptibility of the Source

##### 15.07.01 Determining the Sensitivity of the Water Source

Use the form entitled Source Water Susceptibility Determination Form (Form A) (Appendix 15A-1) or **Ground Water Coastal Plain** Source Water Susceptibility Determination Form (Form A2) (Appendix 15A-2). The form has been designed to evaluate and record the determinations referenced in sections VI.A.1 and VI.A.3 of the SWAP.

Two determinations must be made before proceeding further. One is whether the source is either a surface water or GUDIS. The other determination is the location of the source with respect to the Physiographic Provinces of Virginia.

If the source is a surface water or GUDIS you will use Form A. If the source is located in an area other than the “Coastal Plain Physiographic Province” you will use Form A. If the source is located in the “Coastal Plain Physiographic Province” you will use Form A2. You can determine this by referring to the (1985) Ground Water Map of Virginia prepared by the Virginia Water Control Board. The “Fall Zone Ground Water Area” is not to be considered the “Coastal Plain”. Assistance can also be provided by the **Special Projects Engineer** for verification of sources in question.

The purpose of these forms are to determine the sensitivity of the source and the susceptibility of the sources. Fill in all steps until you reach the last step. First, complete the line identifying the county/city, waterworks, PWSID, and facility being evaluated.

Next, begin the evaluation at Step 1. If the answer to any of the questions is 'YES' circle the instruction in the 'YES' column and proceed to the next step. If the answers to any of the questions are 'NO' circle the instruction in the 'NO' column and proceed to the next step.

(Step 9 of **Form A**; step 7 of **Form A2**) requires the evaluator to list any known contamination of the source within the last 5 years (regardless if the source of the contamination has or has not been identified) in the following order:

- Acute health risk contamination of groundwater sources by microbial contamination (i.e. a geometric mean > 3 in 20 or more total coliform MPN samples or 2 or more identified fecal coliform samples). This means that if this source has been required to install disinfection at any time in the past and this requirement is still in effect, please indicate.
- Associated health risk contamination of water sources by nitrate/nitrite at half the PMCL or greater.
- Contamination by synthetic organic chemicals or volatile organic chemicals.
- Contamination (at a concentration at or above the PMCL) for combined Radium-226 and Radium-228.
- **Contamination (at a concentration at or above the PMCL) for Uranium.**
- Contamination (at a concentration at or above the PMCL) for inorganic chemicals.

This list shall be compiled on Form B.

Step 12 of Form A requires the evaluator to note if any LUA or PSC exists in the Zone 1 assessment area or, for ground water sources, if any PC is present in the Zone 1 assessment area or if any PSC is present in the Zone 2 assessment area. If the answer is 'YES' Form C and Form F must accompany final report. Form E and Form D will be provided by ODW Central Office.

15.07.02: Determining the Susceptibility of the Source: Complete step 12 on Form A or step 10 on Form A2. Identify if the source water type is ground water or surface water. (A GUDIS is considered a surface water for the purpose of this determination.) Note if the source is sensitive. **Where applicable, note if any LUAs, PSCs or PCs (for ground water sources) are present in the assessment area.** Circle the appropriate susceptibility category.

#### 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 or A2), Appendix 15A-1 or 15A-2, completed for each source. Also insert the appropriate explanation(s) for the determination(s) from the bracketed choices in Chart 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 15J 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 PWSID 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.

Appendix 15K will be used to inform local government administrators and cooperative extension agents of the **results** of the SWAR. **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 or A2. The third blank is to be filled in with the explanation from Chart A.** 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 15L is a template that asks for a public service announcement to be voluntarily run stating the results of the SWAR, 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.

#### 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 **changes** within the Zone 1 **or 2** assessment area **during regularly scheduled sanitary surveys**. Identifications will be made by personal observation and by asking the waterworks operating personnel to state **changes to PSCs, PCs, or LUAs** of which they are aware. VDH staff **will attempt to** identify the **PSCs, PCs, or LUAs**, determine the type, 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 15Q). 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 15R. VDH staff shall report this data to the waterworks owner on a form to be attached to the sanitary survey report (Appendix 15S). In order to update the Central Office GIS source water assessment database, the Field Office Technical Services Engineer will transmit **a copy of Appendix 15Q, Appendix 15R, and Appendix 15S** to the **Special Projects Engineer**, who will update the database.

#### 15.11 Outsourced Assessments and Data Collection-THIS TASK HAS BEEN COMPLETED

ODW 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 ODW for review and approval or inclusion into the assessment being prepared by ODW. 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 ODW and the outside agency if the applicable District Engineer met with the agency during the execution of the contract to coordinate efforts.

ODW contracted with the United States Geological Survey to identify the natural susceptibility of regional aquifers. Copies of the *Aquifer Susceptibility in Virginia, 1998-2000*, Water-Resources Investigations Report 03-4278 can be found in each field office or can be found at the following website: [http://water.usgs.gov/pubs/wri/wri034278/wrir03\\_4278.pdf](http://water.usgs.gov/pubs/wri/wri034278/wrir03_4278.pdf).

#### 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 or A2 will be transmitted to the Central Office for inclusion in a SWAP Susceptibility Results Database.

Appendix 15T 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.

VIRGINIA DEPARTMENT OF HEALTH – OFFICE OF DRINKING WATER					
Source Water Susceptibility Determination ( Form A ) Appendix A-1					
County/City:		Waterworks:	PWSID#:	Facility:	
Evaluated by:		Date:	Reviewed by:	Date:	
Step	Complete Entire Worksheet			CIRCLE ANSWER	
1	Is the source a Class IIB (or better) well constructed in accordance with the Waterworks Regulations?			YES	NO
2	Does a driller's log or the U.S. Geological Survey study clearly indicate that an aquitard is present?			YES	NO
3	Does evidence exist to suggest the aquitard does not extend over the entire assessment area?			YES	NO
4	Do any identified Potential Conduits to Ground Water (table 3) penetrate the aquitard? If unknown, answer 'YES'.			YES	NO
5	Does the most recent sanitary survey confirm that the source construction conforms to the construction standards of the Waterworks Regulations?			YES	NO
6	Is the geometric mean > 3 TC/100 ml in 20 or more source (raw) water samples collected in the last 5 years? Have fecal coliform been detected in 2 or more source samples collected in the past 5 years?			(If any are) YES	(If both are) NO
7	<p><b><u>Answers to Step 7 should be based on knowledge that presence is due to a non naturally occurring situation.</u></b></p> Has a nitrate concentration > 5 mg/L been detected in the past 5 years? Has a nitrite concentration > 0.5 mg/L been detected in the past 5 years? Has a combined Radium 226 and Radium 228 concentration > 5 pCi/L in 2 or more samples been detected in past 5 years? Has detection of Uranium > 30 µg/L in 2 or more samples been detected in past 5 years? Has detection of any IOC contaminant exceeded the PMCL in 2 or more samples in the past 5 years?			(If any are) YES	(If none are) NO
8	Have any SOC/VOC contaminants (excluding TTHM's) been detected in the past 5 years?			YES	NO
9	List detected contaminant(s) and sample dates on Form B List of Known Contamination Documentation Form if answered Yes to step 6, 7, or 8.			Go to step 10	
10	[Source <b><u>IS</u></b> Sensitive if answered 'NO' to <b>one</b> or <b>more</b> of the following steps: 1, 2, 3, 5. Source <b><u>IS</u></b> Sensitive if answered 'YES' to one or more of the following steps: 4, 6, 7 or 8.] [Source <b><u>IS NOT</u></b> Sensitive if answered 'YES' to <b>all</b> of the following steps: 1, 2, 3, and 5 and 'NO' to steps 4, 6, 7 and 8.]			Sensitive	Not Sensitive
11	<b><u>DETERMINE THE SUSCEPTIBILITY OF THE SOURCE BY COMPLETING THE CHART BELOW. WORK FROM LEFT TO RIGHT ACROSS THE ROWS.</u></b>				
<u>Source Water Type</u>	<u>Sensitive Source</u>	<u>LUA, PSC or PC Present in Assessment Area</u>		<u>Susceptibility</u>	
		For Ground Water sources does a LUA, PSC , or PC exist in the Zone 1 assessment area or does a PSC exist in Zone 2?	For Surface Water sources does a LUA or PSC exist in the Zone 1 assessment area?		
Ground Water →	NO →	NO →		Very Low	
		YES →		Low	
	YES →	NO →		Moderate	
		YES →		High	
Surface Water →	YES →	NO →	Moderate		
		YES →	High		

VIRGINIA DEPARTMENT OF HEALTH – OFFICE OF DRINKING WATER

Ground Water Coastal Plain Source Water Susceptibility Determination ( Form A2 ) Appendix A-2

<b>County/City:</b>	<b>Waterworks:</b>	<b>PWSID#:</b>	<b>Facility:</b>
---------------------	--------------------	----------------	------------------

<b>Evaluated by:</b>	<b>Date:</b>	<b>Reviewed by:</b>	<b>Date:</b>
----------------------	--------------	---------------------	--------------

Step	Complete Entire Worksheet	CIRCLE ANSWER	
1	Is the source a Class IIB (or better) well constructed in accordance with the Waterworks Regulations?	YES	NO
2	Does a well driller's log, the U.S. Geological Survey Aquifer Susceptibility Study, or an independent geologic study clearly indicate that an aquitard is present within the first 100 ft. below surface elevation and depth of well screen is greater than 100 ft. deep? If unknown, answer 'NO'.	YES	NO
3	<b>Answers to Step 3 should be based on knowledge that presence is due to a non naturally occurring situation.</b> Is the geometric mean > 3 TC/100 ml in 20 or more source (raw) water samples collected in the last 5 years? Have fecal coliform been detected in 2 or more source samples collected in the past 5 years?	(If any are) YES	(If both are) NO
4	Does the most recent sanitary survey confirm that the source construction conforms to the construction standards of the Waterworks Regulations?	YES	NO
5	<b>Answers to Step 5 should be based on knowledge that presence is due to a non naturally occurring situation.</b> Has a nitrate concentration > 5 mg/L been detected in the past 5 years? Has a nitrite concentration > 0.5 mg/L been detected in the past 5 years? Has a combined Radium 226 and Radium 228 concentration > 5 pCi/L in 2 or more samples been detected in past 5 years? Has detection of Uranium > 30 µg/L in 2 or more samples been detected in past 5 years? Has detection of any IOC contaminant exceeded the PMCL in 2 or more samples in the past 5 years?	(If any are) YES	(If none are) NO
6	Have any SOC/VOC contaminants (excluding TTHM's) been detected in the past 5 years?	YES	NO
7	List detected contaminant(s) and sample dates on Form B List of Known Contamination Documentation Form.	Go to step 8	
8	[Source <b><u>IS</u></b> Sensitive if answered 'NO' to <b>one or more</b> of the following steps: 1, 2, and 4. Source <b><u>IS</u></b> Sensitive if answered 'YES' to one or more of the following steps: 3, 5, or 6.] [Source <b><u>IS NOT</u></b> Sensitive if answered 'YES' to <b>all</b> of the following steps: 1, 2, and 4 and 'NO' to steps 3, 5 and 6.]	Sensitive	Not Sensitive

9 DETERMINE THE SUSCEPTIBILITY OF THE SOURCE BY COMPLETING THE CHART BELOW. WORK FROM LEFT TO RIGHT ACROSS THE ROWS.

<u>Sensitive Source</u>	For Sensitive Ground Water sources, does a LUA exist in Zone 1 or does a PSC exist in Zone 1or 2?	Do any identified PCs (Other Wells in Use or Abandoned Wells) to Ground Water penetrate the aquitard referred to in Step 2? If unknown, answer 'Yes'.	<u>Susceptibility</u>
NO →		NO →	Very Low
		YES →	Low
YES →	NO →	NO →	Moderate
	YES →	YES →	
	NO →	YES →	High
	YES →	YES →	

## VIRGINIA DEPARTMENT OF HEALTH – OFFICE OF DRINKING WATER

## Known Contamination Documentation Form ( Form B ) APPENDIX 15B

County/City:

Waterworks:

PWSID#:

Facility:

Compiled by:

Date:

Reviewed by:

Date:

Where applicable, circle 'yes' or 'no'. Note: listing is based on last 5 years of data

MICROBIAL CONTAMINATION

- a. Has a geometric mean determination for 20 or more total coliform samples been conducted in the past 5 years? YES NO
- b. Does the geometric mean exceed 3 col./ 100 ml? If 'yes', what was the geometric mean? \_\_\_\_\_ col./100 ml.
- c. Have fecal coliform bacteria been detected in 2 or more samples collected in the past 5 years? YES NO
- d. If 'yes', list the laboratory sample identification number(s) and sample collection date(s):

NITRATE CONTAMINATION\*

- a. Has the nitrate concentration in any sample collected in the past 5 years exceeded 5 mg/L? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s) and nitrate concentration(s):
- c. Was the 10 mg/L MCL exceeded? YES NO

NITRITE CONTAMINATION\*

- a. Has the nitrite concentration in any sample collected in the past 5 years exceeded 0.5 mg/L? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s) and nitrate concentration(s):
- c. Was the 1 mg/L MCL exceeded? YES NO

SOC/VOC CONTAMINATION\*

- a. Have any SOC/VOC contaminants been detected in the past 5 years? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s), SOC/VOC contaminant(s) and SOC/VOC concentration(s) under line 'c'.
- c. Was any SOC/VOC MCL exceeded? YES NO If yes, circle samples which exceeded the MCL.

RADIUM 226 AND RADIUM 228 CONTAMINATION\*

- a. Has a combined Radium 226 and Radium 228 concentration exceeded 5pCi/L in 2 or more samples collected in the past 5 years? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s) and Radium 226 and Radium 228 concentration(s) under line 'c'.
- c. Was the Radium 226 and Radium 228 MCL exceeded? YES NO If yes, circle samples which exceeded the MCL.

URANIUM CONTAMINATION\*

- a. Has detection of Uranium > 30 µg/L in 2 or more samples been detected in past 5 years? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s) and calculated uranium concentration(s):
- c. Was the Uranium MCL exceeded? YES NO If yes, circle samples which exceeded the MCL.

INORGANIC CHEMICAL CONTAMINATION\*

- a. Has any inorganic chemical contaminant in any sample collected in the past 5 years equaled or exceeded its' respective PMCL? YES NO
- b. If 'yes', list the laboratory sample identification number(s), sample collection date(s) and contaminant concentration(s):

\*Contamination refers to situation whereby source quality was degraded by human activity.















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.

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. Your assistance in identifying appropriate LUAs, PCs, and PSCs will ensure a more complete susceptibility determination.

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

Sincerely,

Enclosures: SWAP Appendix F-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)

**cc: VDH – Central Office**

LETTER DESCRIBING THE ASSESSMENT TASK AND REQUESTING ASSISTANCE IN PERFORMING THE  
ASSESSMENT AND LAND USE INVENTORY [for ground water 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.

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. Your assistance in identifying appropriate LUAs, PCs, and PSCs will ensure a more complete susceptibility determination.

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

Sincerely,

Enclosures: SWAP Appendix F-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)

**cc: VDH – Central Office**



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 Form (Form E)" for this [these] source[s], ranked in order of greater public health risk. [The Potential Conduits to Ground Water are shown in Zone 1 and inventoried on the "Potential Conduits to Ground Water Inventory Form (Form F)" for this [these] source[s]].

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

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

Ground Water 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

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

Ground water 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)
- Ground Water Coastal Plain** Source Water Susceptibility Determination Form (Form A2)
- 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 Form (Form E)
- Area Features Documentation Form (Form E2)
- Potential Conduits to Ground Water Inventory Form (Form F)
- Best Management Practice Documentation Form (Form G)
- Chart A (Susceptibility Explanations)
- Chart B (Key Definitions)

**Chart A**

**Susceptibility Classes**

<b>Susceptibility</b>	<b>Explanation</b>
Very low	Properly constructed ground water 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 with no land use activities of concern or potential conduits to ground water in the Zone 1 assessment area nor potential sources of contamination in the Zone 1 or Zone 2 assessment areas
Low	Properly constructed ground water 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 with <b>[choose]</b> [land use activities of concern][and][potential conduits to ground water] in the Zone 1 assessment area <b>[and]</b> [potential sources of contamination in the Zone 1 or Zone 2 assessment areas]
Moderate	<b>[choose]</b> [Ground water source constructed in an area that tends to promote migration of contaminants] <b>[or]</b> [Ground water source located in an area that tends to inhibit contaminant migration but unprotected <b>[choose]</b> <b>[because of unknown or inadequate well construction]</b> <b>[and]</b> [by an appropriate aquitard] <b>[or]</b> <b>[Properly constructed ground water source located in an area that tends to inhibit contaminant migration in which contaminants have been detected within the last five years]</b> <b>[or]</b> <b>[Ground water source located in an area that tends to inhibit contaminant migration but an identified potential conduit to ground water penetrates the aquitard in the assessment area]</b>
High	<b>[choose]</b> [Ground water source constructed in an area that tends to promote migration of contaminants <b>with [choose] [land use activities of concern][and][potential conduits to ground water] in the Zone 1 assessment area[potential sources of contamination in the Zone 1 or Zone 2 assessment areas]</b> ] <b>[or]</b> [Ground water source construction is unknown or inadequate <b>with [choose] [land use activities of concern][and][potential conduits to ground water] in the Zone 1 assessment area[and][potential sources of contamination in the Zone 1 or Zone 2 assessment areas]</b> ] <b>[or]</b> [Ground water source located in an area that tends to inhibit contaminant migration but is unprotected <b>[choose]</b> <b>[because of unknown or inadequate well construction]</b> <b>[and]</b> by an appropriate aquitard <b>with [choose] [land use activities of concern][and][potential conduits to ground water] in the Zone 1 assessment area[and][potential sources of contamination in the Zone 1 or Zone 2 assessment areas]</b> ] <b>[or]</b> [Ground water source located in an area that tends to inhibit contaminant migration in which contaminants have been detected within the <b>last</b> five years] with <b>[choose]</b> [land use activities of concern][and][potential conduits to ground water] in the Zone 1 assessment area <b>[and][potential sources of contamination in the Zone 1 or Zone 2 assessment areas]</b>
Moderate	<b>[choose]</b> [Surface water] <b>[or]</b> [Ground water 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 <b>or potential sources of contamination</b> of concern in the Zone 1 assessment area
High	<b>[choose]</b> [Surface water] <b>[or]</b> [Ground water 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 <b>or potential sources of contamination</b> 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.
<b>Contaminant:</b>	<b>Any chemical element or compound or cause of change in physical properties that renders water unfit for a given use. In the subsurface, this may be thought of as the presence of any chemical element or compound at a level and in a form that may cause damage to human or environmental receptors.</b>
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 ground water sources, the boundary typically approximates the surface area that contributes water to the aquifer.
Ground Water:	Water that is found below the surface, which has accumulated in pore spaces of geologic material.
Ground Water Under the Direct Influence of Surface Water:	A ground water 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 ground water source meeting certain conditions as a Ground Water 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 ground water 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 of 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	A waterworks that is not a community waterworks but that regularly serves at

Waterworks: least 25 of the same persons for 6 months or more per year.

**Chart B: Definitions of Key Terms**

Potential Conduits to Ground Water:	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 ground water.
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 ground water (for ground water 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 or otherwise known area of recharge from which overland flow drains to a water supply intake.

Letter from ODW to Owner Transmitting Source Water Assessment Report

SUBJECT: \_\_\_\_\_  
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, Office 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).

**If your waterworks is classified as a community waterworks**, 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

cc: **VDH – Central Office**

Letter To County Administrator, City Administrator, Etc. Informing Of Existence Of Source Water Assessment Report

Name & Address  
Town/County/City Administrator

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 listed below. 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. Each owner has been provided a report containing maps, tables, and susceptibility ratings for each of their sources. Results of all completed Source Water Assessment Reports can be found on our VDH Office of Drinking Water Public Website at <http://www.vdh.virginia.gov/dw>.

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

Source Name	Relative Susceptibility to Contamination	Explanation

Sincerely,

\_\_\_\_\_  
District Engineer  
Field Office

cc: VDH – Central Office  
cc: VDH – Local Health Department

Request for Media to Make a Voluntary PSA Stating Results of SWARs

(DATE)

Name & Address  
for Newspaper

Dear \_\_\_\_\_:

**A Source Water Assessment Report (SWAR) was recently completed for the (name of waterworks). The results can be found on our VDH Office of Drinking Water Public Website at <http://www.vdh.virginia.gov/dw>. Below you will find an sample announcement language that can be used for the recently completed SWAR. An announcement may be published as a community service, if you so desire. No state funds are available to advertise these announcements.**

-----  
**Sample Announcement Language**

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.

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

Source Name	Relative Susceptibility to Contamination
Well 50	Low
Well 51	Moderate
Well 53	Low

-----  
Sincerely,

\_\_\_\_\_  
District Engineer  
\_\_\_\_\_  
Field Office

cc: VDH – Central Office

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 or A2)
    - \_\_\_\_\_ 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 Ground Water Inventory Form (Form F) – Ground Water Sources Only
    - \_\_\_\_\_ 8. Best Management Practice Documentation Form (Form G) – If applicable
    - \_\_\_\_\_ 9. Susceptibility Explanations (Appendix A)
    - \_\_\_\_\_ 10. Key Definitions (Appendix B)
- 

**2. Waterworks Operator (if applicable):**

- \_\_\_\_\_ A. 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 or A2)
    - \_\_\_\_\_ 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 Ground Water Inventory Form (Form F) – Ground Water Sources Only
    - \_\_\_\_\_ 8. Best Management Practice Documentation Form (Form G) – If applicable
    - \_\_\_\_\_ 9. Susceptibility Explanations (Appendix A)
    - \_\_\_\_\_ 10. Key Definitions (Appendix B)
- 

**3. Local Health Department**

- \_\_\_\_\_ A. Copy of the letter to the County Administrator/City Manager/Town Manager, etc. (Appendix 15K)
- 

**4. 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)
-

Waterworks Name: \_\_\_\_\_

**5. Local Newspaper**

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

**6. Office of Drinking Water – Central Office**

- \_\_\_\_\_ A. 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 or A2)  
\_\_\_\_\_ 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 Ground Water Inventory Form (Form F) – Ground Water Sources Only  
\_\_\_\_\_ 8. Best Management Practice Documentation Form (Form G) – If applicable  
\_\_\_\_\_ 9. Susceptibility Explanations (Appendix A)  
\_\_\_\_\_ 10. Key Definitions (Appendix B)  
\_\_\_\_\_ D. Copy of the letter to the County Administrator/City Manager/Town Manager, etc. (Appendix 15K)  
\_\_\_\_\_ E. Copy of the letter to the local newspaper transmitting the Public Service Announcement (App. 15L)

**7. Office of Drinking Water – \_\_\_\_\_ Field Office**

- \_\_\_\_\_ A. 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 or A2)  
\_\_\_\_\_ 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 Ground Water Inventory Form (Form F) – Ground Water Sources Only  
\_\_\_\_\_ 8. Best Management Practice Documentation Form (Form G) – If applicable  
\_\_\_\_\_ 9. Susceptibility Explanations (Appendix A)  
\_\_\_\_\_ 10. Key Definitions (Appendix B)  
\_\_\_\_\_ D. Copy of the letter to the County Administrator/City Manager/Town Manager, etc. (Appendix 15K)  
\_\_\_\_\_ E. Copy of the letter to the local newspaper transmitting the Public Service Announcement (App. 15L)
- 

Dated Initials: \_\_\_\_\_

**Department of Conservation & Recreation Virginia Agricultural BMPs**

<b>Practice Number</b>	<b>Practice Name</b>
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

<b>Practice Number</b>	<b>Practice Name</b>
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

<b>Type of Data</b>	<b>Type of Source</b>	<b>Data Provider</b>
Boat Ramps	Surface	VDGIF
Commercial and general aviation airports	Ground and Surface	VEDP
Golf courses	Ground and Surface	ESRI DATA, VEDP
Hazardous waste sites	Ground and Surface	DEQ
Highways	Ground and Surface	VDOT
Hospitals	Ground and Surface	VEDP
Inactive waterworks wells	Ground	SDWIS DATABASE
Industrial Sites	Ground and Surface	Harris Info Services
Leaking Underground Storage Tanks	Ground	DEQ
Marinas	Surface	VDH Marina Program
VPA Permits - No-discharge facilities (sewage lagoons, etc)	Ground and Surface	VEDP, DEQ
VPDES waste discharges	Ground and Surface	VEDP, DEQ
Open solid waste disposal facilities	Ground and Surface	VEDP, DEQ
Rail lines	Ground and Surface	VDOT
RCRA sites	Ground and Surface	DEQ
Storm Water Permits	Ground and Surface	DEQ
Superfund Sites	Ground and Surface	EPA
Tire piles	Ground and Surface	CBLAD, DEQ
Class V Underground Injection Wells	Ground	EPA







**SEE WORKING MEMO 851 ON SANITARY SURVEYS**  
**Revised Ground Water System Sanitary Survey Report Part II**  
**System Survey Information (Field Notes) Addressing Protection Efforts**  
**and Changes to Previous Results of Source Water Assessment Inventory**

**J. Addition to Ground Water Sanitary Survey Reports**

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

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

Frequency for conducting ground water evaluations: \_\_\_\_\_

When was the last evaluation performed? \_\_\_\_\_

Performed by: \_\_\_\_\_

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

Discuss:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What is the nature of ground water setting? Check all that apply.

- shallow fractured rock (less than 125 feet)
- deep fractured rock (greater than 125 feet)
- unconfined unconsolidated material aquifer
- unconfined consolidated material aquifer
- confined unconsolidated material aquifer
- confined consolidated material aquifer

What is size of the ground water recharge area: \_\_\_\_\_

Percent of ground water protected/controlled: \_\_\_\_\_

How is the ground water controlled/protected?

- ordinances  owned by waterworks
- zoning  other \_\_\_\_\_

2. Identify any new land use activities of concern, potential conduits, or changes to potential sources of contamination in zone 1 or 2 as defined in WM 852 Source Water Assessment Program Implementation Manual using Form C or F. Forward Form C or F to Special Projects Engineer in Central Office to ensure changes are made to SWAP GIS database.

3. Does waterworks have a spill response plan?  Yes  No

**B.**            **Has it been tested?**

**Yes**

**No**

**SOURCE WATER PROTECTION (continued)**

4. Has there been a contamination event since last evaluation (date of evaluation \_\_\_\_\_)?  
( ) Yes ( ) No

If "Yes", discuss (source, materials and quantities involved, effects on operation, etc.):

---

---

---

---

---

**Comments:**

---

---

---

---

---

---

---

---

Addition to Surface Water Sanitary Survey Reports **Addressing Protection Efforts and Changes to Previous Results of Source Water Assessment Inventory**

**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-ODW 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 **the** 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 **changes to potential sources of contamination in zone 1 or 2 as defined in WM 852 Source Water Assessment Program Implementation Manual using Form C or F. Forward Form C or F to Special Projects Engineer in Central Office to ensure changes are made to SWAP GIS database.**

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. **Use WM 852 Appendix 15S.**





