

## Appendix B Delaware Citizen and Technical Advisory Committee Meeting Summaries

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT PROGRAM (SWAP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE (CTAC)

Delaware Department of Public Safety  
Conference Room  
Dover, DE

Wednesday  
September 16, 1998  
8:30a.m. - Noon

#### ***I. ADMINISTRATIVE***

Doyle Brown, DNREC, acted as meeting facilitator and provided the welcome and introductions.

John Barnes, DNREC, provided information on the SWAP. He outlined the CTAC agenda:

- Development of Citizen And Technical Advisory Committee (CTAC) 7/98
- SWAP Document Outline Development 8/98
- First CTAC Meeting 9/98
- CTAC Meetings and SWAP Development 9/98-1/99
- Draft SWAP Document to EPA 2/6/99
- Respond to EPA's comments on SWAP Document 3/99

John also highlighted the major parts of the SWAP (taken from EPA guidance)

- Provide for public participation
- Complete source water assessments
- Make assessments available to public water consumers
- Create a State Source Water Protection Program Implementation Plan

Doyle Brown discussed the CTAC proposed calendar. It was decided by all present that the meeting dates would remain as proposed, but that all meetings would be held in Dover, DE starting at 8:30am. Doyle also discussed the mission of the committee. Frank DeRosier asked whether the SWAP program would address domestic wells. It was concluded that the program funding does not allow for the inclusion of private wells, but that this point can be discussed further. Doyle noted that a list of all registered wells included in the assessment will be listed in an appendix to the SWAP plan. In addition, it was explained that the CTAC meetings are open to the public.

#### ***II. OVERVIEW OF DELAWARE HYDROGEOLOGY***

John Talley from Delaware Geological Society (DGS) explained DGS's work program and provided a technical summary of Delaware's hydrogeological formations. He described in detail the Columbia Aquifer, which in DE, is the aquifer closest to the ground surface and most susceptible to contamination from ground sources. A question was posed about well testing. All public wells are tested for contaminants and the Public Health Office of Drinking Water provides test kits for domestic wells. Another question was posed about contamination from the inland bays. Water flows from the groundwater into the bays, so any contaminants in groundwater could potentially reach the bays, but no contamination in the bays can reach groundwater.

#### ***III. SOURCE WATER DELINEATION***

Martin Wollaston from the Water Resources Agency (WRA) asked that all comments on the SWAP plan got to him, as WRA will prepare the plan. Martin reviewed the SWAP plan outline and the draft third chapter, which were both presented to the CTAC for review and comment. As two-thirds of the Christina Basin sets in Pennsylvania (PA), WRA will be coordinating with Pennsylvania agencies on water quality information. (PA kicked off their own SWAP program a year ago.) WRA already has several programs in place, which can provide water quality information, maps, and contacts to the SWAP project.

The next chapter to be drafted is Chapter 4: Contaminant Sources. In most cases surface water is already protected via floodplain, vegetation buffers, and erosion-prone slope codes enacted by New Castle County (NCCo). WRA will be looking at contamination in these areas and the susceptibility of the water supply. A question was posed about aboveground storage tanks. It was explained that existing databases would be used to gain information on these and other structures. In response to a question about Naaman's Creek there are no public wells near Naaman's Creek and will therefore not be included in the SWAP plan. It is, however, included in the Piedmont Protection Program.

Databases exist that include all public wells and NCCo code prohibits construction within 300 yds. of a public well. The SWAP program aims to protect wellhead, wellfield, and recharge areas.

Steve Smailer, DNREC, explained the recharge and wellhead assessment and mapping program currently underway in Kent and Sussex counties. In response, many CTAC members expressed concern about contamination that may be outside these areas. It was noted that the SWAP program is designed to address 1) existing regulations, 2) non-regulatory incentives that could be better guided and 3) educating local municipalities to increase their regulatory control. Complaints were made that Kent and Sussex counties are not legislating source water protection. Concern was also expressed from a representative of the local medical community.

#### ***IV. PUBLIC PARTICIPATION FOR SWAP***

Gerald Kauffman, WRA, explained that EPA requires that the CTAC respond to several questions. He reviewed each question, provided a possible response, and then asked for comments from the CTAC.

#### **Delineation, Source Inventory, and Susceptibility:**

- *What delineation method and criteria will be used for systems using ground waters? Where shall recharge areas not be included and why?*

This is a multiple-step process. First, all wells must be identified, and then WRA/DNREC will delineate sources, wellhead areas (This is complete in NCCo.), and recharge areas with high percentages of sand and gravel.

Ashley Toy, EPA, expressed concern about recharge to aquifers other than the Columbia Aquifer. There are 2 types of wellhead areas: fixed and wellfields, and both should be considered.

Bill Walsh noted that recharge areas outside the state that effect DE water systems should be included. High pumping volume of wells may change the surrounding hydrogeology. It was explained that quantity of water pumped is factored in to wellhead drawdown area and that the radius of influence is based on quantity pumped.

John Barnes explained that wells with less than 50,000-gpd yield are given a 150' radius. Wells with greater yield require a groundwater model.

Time-of-travel of contaminants is also being taken into consideration. John Barnes explained that DE now uses a 5-year time-of-travel.

Ted from Tetrattech requested that the program consider how recharge maps may affect land use and property values, and to consider mapping separately areas relating directly to editing wells and areas that may be near wells in the future.

#### **Boundary Waters, Multi-State Rivers, and the Great Lakes:**

- *What agreement should the state maintain or initiate with other states, tribes, or nations to gain more complete and consistent source water assessments?*

There may possibly be a voluntary agreement through the Christina Basin Committee.

Marian Stewart recommended working with the Delaware Estuary Program (DRB).

John Talley recommended adopting regulations to reach TMDL at the state line. This is currently under negotiation and should be in place by the year 2000.

The USGS and EPA representatives agreed to provide information on recharge areas in Maryland to the committee.

#### **Public Participation:**

- *Should the state do more to provide adequate opportunity for stakeholder groups to participate in the development of the program? If so, how?*

For the program, there will be CTAC meetings, copies of the SWAP plan chapters provided for review and comment, and workshops in January and February for the public to review the final draft of the SWAP plan.

- *Should the state do more to receive recommendations from both technical and citizen's perspectives?*

Both WRA and DNREC representatives can be reached via e-mail, post, telephone, and fax.

- *What should the state do for ongoing public participation in implementing assessments once the state's SWAP is approved?*

An Internet WebPage is maintained by the WRA and contains information on the SWAP.

Also, 4 committees chaired by WRA and DNREC have public outreach including the Christina Basin Committee, the Draught Management Committee, the NCCo Resource Area Technical Advisory Committee and the Whole Basin Program.

A plan is also under creation to include staffers in Public Utility bills. Other options include meeting with Christopher Toulou, providing press releases to local newspapers and cable television news programs, and submitting articles to various DNREC and UofD newsletters.

Steve Smailer offered to provide DNREC information brochures to CTAC members who would like to share information with their respective organizations.

#### **Making the Results of Assessments Available to the Public:**

- *What should be included in the results of the assessments, what should be the format of an understandable report on results, and when should the results be made available?*

A cover and outline of the plan will be available upon EPA approval.

- *How and when should the state make available all the information collected during each assessment when someone requests it?*

Those who would like a copy of the SWAP plan may contact WRA or DNREC.

- *What type of maps should be developed to display the results of the assessments?*

DNREC and WRA both have GIS capabilities. John Talley recommended that the final data might be included on a CDROM.

- *How and when should the state make public all information collected during each assessment for a public Water Supply(ies)?*

An Internet WebPage is maintained by the WRA and contains information on the SWAP. A plan is also under creation to include staffers in Public Utility bills. Also, both WRA and DNREC can provide additional information requested via e-mail, post, telephone, and fax.

- *How should the state or delegated entities provide wide notification of the availability of the results and other information collected?*

Besides the public outreach program already detailed, including the WebPage and staffers in Public Utility bills, brochures, press releases, and the community bulletin boards at public libraries will be used.

#### **V. DISCUSSION/NEXT STEPS/NEXT MEETING**

A representative from the AARP questioned how the CTAC will coordinate with other committees with similar interests, and is there competition for funding?

John Talley asked if there were any other organizations that should be included in the CTAC. He recommended the inclusion of the Chamber of Commerce, representatives from local governments and someone from the agriculture community. Frank DesRosier felt the CTAC should include community environmental water programs. The inclusion of the Delaware Poultry Industries (DPI) in Georgetown was also proposed.

Ashley Toy suggested that an environmental planner could go to local municipality meetings and she expressed concern over interstate boundaries.

It was suggested that a glossary be included in the SWAP plan.

Bill Walsh requested that the plan also include potential future water sources.

There was a complaint that the meeting went too quickly over technical parts such as time-of-travel. A presentation, including diagrams of site delineation, will be added to the next meeting. Sewage and septic tanks will also be discussed at the next meeting. Finally, it was agreed that the next chapter will be sent via post 1 week before the next scheduled meeting.

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT PROGRAM (SWAP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE (CTAC)

Delaware DNREC  
Aquatic Resources Center  
Smyrna, Delaware

Wednesday  
October 14, 1998  
8:30 am - Noon

#### *I. ADMINISTRATIVE*

John Barndt, DNREC, served as the meeting chairman. He welcomed committee members and asked all to introduce themselves. The attendees were asked to sign in when they arrived, make any changes to addresses as necessary, and provide an e-mail address if they have one. Mr. Barndt stated that each member should have received two packets by post within the last week. One packet contained the September meeting summary plus the agenda and questions for the October meeting. The second mailing was the first draft of Chapter 4: Contaminant Source Inventory of the SWAP plan. CTAC members were to have reviewed the meeting summary and the draft chapter for this meeting.

Mr. Barndt also reviewed the meeting schedule. All remaining meetings will be held at the Delaware Department of Public Safety in Dover. The City of Dover has agreed to provide a two-hour tour of its water facilities on November 18, immediately following the CTAC meeting. United Water Delaware has agreed to provide a tour of its facilities in New Castle County (NCC) on November 23. For those who would prefer, transportation will be provided from Dover to the United Water Delaware facilities. More information on the tours will be provided via post.

Lesley McKnight, WRA, reviewed the SWAP webpage. The address is <http://www.wr.udel.edu> and all comments on the webpage should go to Ms. McKnight at [mcknight@udel.edu](mailto:mcknight@udel.edu). Mr. Barndt asked for comments on the September 16 Meeting Summary. Since there were none, a motion to accept the summary was made by Mr. Kraeuter; seconded by Mr. Bross, and unanimously approved. The September meeting summary will be posted to the website now that the committee has approved it.

Steve Smailer, DNREC, clarified that the SWAP plan development is a cooperative effort with WRA being conducted by DNREC.

#### *II. CHAPTER 3: SOURCE WATER DELINEATION STATUS*

Martin Wollaston, WRA, noted that there were several questions on Surface Water delineation at the September CTAC meeting. Since that meeting, he had received the EPA guidance on surface water delineation and will expand on the description presented previously.

The approach taken to delineating source water areas will have implications for the next two steps in the SWAP program – the potential contaminant inventory and the susceptibility analysis. Therefore, it is being recommended that a 3-level hierarchy be established for delineating surface source water areas. Level 1 includes all areas in the watershed above intakes. A database exists for the Christina River Basin in Delaware and Pennsylvania so that these areas may be located easily. Level 2 includes a 50' to 200' buffer area around streams and other water bodies. GIS maps and aerial photos will be used to locate potential contamination sources in this zone. Staff will attempt to do site visits to verify potential contamination sources to surface water. Level 3 includes flood plains and erosion-prone slopes. This area will be surveyed through different programs such as the Piedmont Inventory, and the field reconnaissance of blueline streams in the Piedmont Basin.

*Frank Desrosier, AARP, asked what was meant by a survey. Mr. Wollaston explained that staff would look for physical features, drums, and pipes. Mr. Smailer noted that there are some routine monitoring stations as well. These are for surface water monitoring and a watershed assessment is routinely done also to monitor the health of the state's streams.*

*Mr. Desrosier expressed concern about contamination from runoff. Mr. Wollaston explained that the source water protection program is a multi-step process and that the first step will be source delineation. Chapter 4, to be presented later in the meeting, will address potential sources of contamination.*

*Joseph Demul, AARP, asked if other monitoring efforts were being coordinated. Hassan Mirsajadi, DNREC, answered that the 200 stream water quality monitoring stations in Delaware (40 in the Christina Basin) are monitored for surface water quality and other methods such as testing of fish tissue and sediment sampling are used. Mr. Barndt stated that surface water data is summarized every two years. Below the C&D Canal groundwater is used as the only source of drinking water. Therefore, surface water delineation is only relevant for northern Delaware.*

Mr. Wollaston also noted that one of the three main methods of surface water delineation noted by EPA is time-of-travel. This method will be used to develop guidelines for the time it takes for streamflows in the Pennsylvania portion of the watershed to reach Delaware intakes.

Next, Mr. Smailer described wellhead area methodology. Water flows underground and, in general, the water table mimics the land surface, flowing down gradient, and moving through an idle well. Pumping will decrease the water level around the well, causing a cone of depression. The cone expands until the amount of water entering the cone equals the amount being withdrawn from the well, or until the well is dry. The zone of contribution includes water that will eventually be drawn into the well due to both pumping and natural flow. The zone of transport is a portion of the zone of contribution defined over a certain period of time.

There are many situations that can change the shape of the wellhead area. These include transmissivity (the amount of water that can flow through the aquifer in a certain amount of time), solid rock boundaries or other geological conditions, a surface water body nearby,

multiple wells pumping in the same area, and the amount of water pumped by the well. Depending on the complexity of the area, different methods for delineating wellhead areas will be used. For instance, wells screened below a clay layer may have a small fixed radius, while wells in more geologically complex areas may have a detailed computer-modeled wellhead area.

*Mr. Desrosier questioned what happens to a contaminant in a wellhead area. Mr. Smailer responded by giving some examples. Some contaminants are removed through natural attenuation, while for other chemicals, natural attenuation often does not occur and active remediation must be employed.*

*Jeff Bross, Committee of 100, wished to note that geology really changes the wellhead complexity, especially fractured rocks and rock formations. Mr. Smailer agreed that more than one method would be used to delineate wellhead areas. In some cases, dye-tracing may be used. Mr. Smailer also noted that a more complex setting may require a more complex modeling effort. As the complexity increases, so does the cost, time and effort for the modeling.*

*Mr. Demul expressed concern for prevention of saltwater in domestic wells, which in his town he attributed a recent event to a trench dug to lay pipe. Mr. Smailer explained that this phenomenon depends on the subsurface environment near the domestic wells. If the company digging the trenches is pumping water while they dig, this could possibly impact the domestic wells. This problem is very site-specific near bays and oceans and could be discussed further if seen as a problem.*

*Joseph DiNunzio, Artesian Water Company, wished to point out that concern should be focused on the zone of contribution, not the zone of influence. Bruce Kraeuter, Artesian Water Company, felt that for confined wells, the 300' radius leaves elbowroom around the well itself to protect it from physical damage. Jigar Patel, Delaware Rural Water Association, pointed out that a 150' radius will be used for wells pumping less than 50,000 gpd. Mr. Barndt agreed that it is important to look at the geology around the well and that contaminant sources in close proximity to a well may or may not affect the well depending on the well depth and other factors.*

Next, John Talley, DGS, presented information on groundwater recharge potential mapping. Recharge potential mapping was initiated in New Castle County (NCC) in 1974 for the NCC Water and Sewer Management Office (now the Water Resources Agency) with funds provided by EPA under Section 208. Soils and underlying rocks were characterized by their capacity to transmit water. DGS currently has a contract with DNREC to map groundwater recharge areas in Kent and Sussex counties using "stack-unit mapping" methodology. Mapping is concentrated from land surface to a depth of 20 feet below land surface because almost all water that recharges the groundwater system infiltrates through this near surface zone, this layer almost always contains the water table, and therefore, groundwater recharge occurs in this layer, and the 20 foot thickness is great enough to filter some local scale heterogeneity. Information pertaining to this 20-foot zone is obtained from records of well drillers, engineering test borings, investigation of outcrops, and from drilling completed by the DGS. The sediment types described in logs or outcrops are evaluated and a textural classification is assigned along with a

thickness for each unit. A numerical value is assigned to each textural classification and the entire 20-foot section is rated as having excellent, good, fair, or poor recharge potential. Areas rated as excellent are the most important to protect. In NCC land use decisions are affected by recharge rating and ordinances that limit what can be done on areas rated as excellent are in place. Also in NCC procedures have been developed for challenging areas mapped as having excellent recharge potential. A detailed description of groundwater recharge potential mapping methodology is available from the DGS.

*Judy Denver, USGS, asked if there has been any comparison between nonpoint source contamination and recharge areas. Mr. Barndt answered that this was attempted in a pilot area, but that there was difficulty getting enough datapoints to draw any conclusions.*

*Mr. Kraeuter questioned if good recharge areas corresponded with zones of contribution. Mr. Talley responded that they might correspond, depending on the geology. A majority of DE has already had recharge areas delineated and the entire state should be completed by 2001.*

*Chris Brown, Delaware Nature Society, asked if boundaries are subject to change if new information becomes available. Mr. Talley noted that yes, changes can be made, and reiterated that challenges have been made to delineation areas in NCC.*

*Mr. Desrosier wondered if well testing information might indicate trends. Mr. Talley responded that the information did not apply to recharge areas, but it was used to indicate trends in groundwater quality, and that the testing results are shared since testing is expensive.*

### **III. CHAPTER 4: CONTAMINANT SOURCE INVENTORY**

Mr. Barndt noted that there has been a lot of work by DNREC to map locations of potential contamination sources in the four major basins in Delaware. Thus, much of the potential contaminant source inventory required for the SWAP is underway.

Jerry Kauffman, WRA, provided an overview of the next preliminary chapter, Chapter 4: Contaminant Source Inventory. The committee is encouraged to review the chapter and offer comments. He explained that the purpose of the SWAP is to protect DE drinking water sources. The program involves 3 steps: delineate source water protection areas, conduct an inventory of potential contaminant sources, and then to conduct a susceptibility analysis.

For the contaminant source inventory, EPA requires that states identify contaminants of concern, outline existing data, identify methods for locating potential contamination sources, and then defining and prioritizing significant contaminant sources.

Table 4.1 identifies contaminants of concern listed under DE's drinking water regulations with levels set by DE. *Mr. Desrosier felt that the E. coli testing procedure was confusing and that a footnote should be added. Mr. Kraeuter noted that some contaminants were not listed. Donna*

*Stulir, Office of Drinking Water, stated that there are 84 contaminants in DE's regulations. Mr. Kauffman agreed to investigate these comments further and incorporate them into Table 4.1.*

Mr. Kauffman continued that there is already much data available on point source contaminants. Non-point source contaminants are diffused sources that can not be pinpointed. Existing GIS information is rather extensive in DE and can be used to help identify contaminant sources. Also, under the existing Whole Basin Program, basins will be mapped on a basin-by-basin basis for known contaminant sources.

*Gene Campbell requested that more information and investigation be provided in the chapter with respect to the draft Seaford map – it was incomplete. Mr. Kauffman replied he was aware that some information was missing from the map, but he wanted to get a concept map into the draft chapter.*

The SWAP plan also defines criteria of concern for contamination sources, including proximity to water supplies. Best Professional Judgement has been used to define the criteria, but feedback from the committee is expected as well.

*Mr. Kraeuter expressed concern that non-regulated activities such as photo-labs are not listed. Mr. Bross noted that general NPDES permits are included, but that it is hard to get information on privately-owned, possibly leaking, underground storage tanks. Mr. Barndt reiterated that the committee should identify any gaps they feel should be addressed, and those gaps will be investigated.*

Steve Williams, DNREC, presented a database created by DNREC, which includes potential and known sources of contamination. The database has mapping capabilities and can identify sources by location, site type, basin location, contaminant potential, rating, specific type of contaminant, and monitoring status. This information can be combined with wellhead and recharge data to determine which areas should be investigated further. A next step will be to hotlink the database to DNREC's other programmatic database.

*Mr. Kraeuter requested that this database be made available to the public. Mr. Williams explained that it is not yet available because the database is not complete, but should be completed within the next year.*

*Pam Thornburg, Delaware Farm Bureau, expressed concern that private farms might not be accurately represented in the database. Mr. Williams agreed, but noted that information may not be available, as some farms may not be documented. The goal is to add this information by first targeting state and federal agricultural lands, then update the inventory by working with the conservation districts.*

*Mr. Desrosier asked about fertilizers used by private homeowners and noted that homeowners are excluded from responsibility and may not even be aware of the contamination that fertilizers may cause. Mr. Williams explained that the Whole Basin Program will help address this*

*problem and that DNREC is currently doing an inventory of nutrient management practices of golf courses and lawn-care companies. The Pollution Prevention Program is another program to help educated homeowners about lawncare. Mr. Barndt noted that one purpose of the SWAP is to make information available to the public and to local communities to assist them in creating regulations. Mr. Smailer added that as part of the Pollution Prevention Program, point-of-purchase displays may be used to educate homeowners and through the Whole Basin effort, aerial photos will be used to determine residences with septic systems. Mr. Demul felt that there should be cooperation between CTAC and other organizations such as the Center for Inland Bays (CIB). Mr. Williams noted that there are DNREC employees on CIB committees and that CIB is funding a portion of the septic system mapping project.*

Blair Venables demonstrated the groundwater model and answered questions during the break.

#### ***IV. DISCUSSION OF KEY SWAP QUESTIONS***

Dale Long, EPA, provided EPA publications for delineation methodology, and a guide to wellhead protection.

Doyle Brown, DNREC, presented the following questions to the committee so that the committee might provide input. He requested that long responses be sent to WRA and brief comments could be provided at the meeting.

##### **Source Inventory for Drinking Water Supplies**

- WHAT GENERAL SEQUENCE SHOULD DELAWARE FOLLOW IN DELINEATION OF SOURCE WATER PROTECTION AREAS, IDENTIFICATION OF EXISTING POTENTIAL SOURCES OF CONTAMINATION, AND CONDUCTING ANALYSIS OF STREAM SUSCEPTIBILITY TO CONTAMINATION?

*Tad Yancheski, Committee of 100, had provided written comments to Mr. Wollaston earlier and then presented these comments in the meeting. His concerns centered on possible contamination sources that he felt were not addressed adequately in the chapter. He mentioned stormwater management systems and high-density stormwater basins that discharge into streams should specifically be addressed, including time-of-travel concerns. Mr. Barndt noted that some of this work has been done through the Christina Basin project. Mr. Kauffman noted that stream gauge data and surface water quality monitoring station information is available.*

*Mr. Yancheski also expressed concern about the chemicals from different land uses that find their way into the stormwater and eventually are dumped into surface water systems. Mr. Kauffman discussed the Total Maximum Daily Load model being created by the State of Delaware in conjunction with Pennsylvania regulators for the Christina River Basin, but this will take 2-3 years.*

*Dave Reinhold, DNREC, expressed concern that not all storm sewers and streams that receive stormwater are mapped and that NCC should be able to provide some of this information. Mr.*

*Kauffman stated that data is available from DOT and NCC on the USEPA NPDES municipal stormwater permit program and the stormwater outfalls have been mapped for the Christina Basin. He added it would be difficult to map the entire NCC stormwater system and capital intensive without providing much added value to the SWAP project. Information from the NPDES program also provides possible contamination sources. Land use data is available from the Christina River Basin project.*

*Mr. Barndt noted that the biggest gap identified has been with surface water. Mr. Yancheski would like to see large manufacturing facilities that use large amounts of chemicals included as potential sources of contamination. Mr. Smailer answered that the database includes businesses that store certain chemicals onsite. Agricultural practices downstate will also be investigated. Mr. Barndt agreed that accidental releases are a concern in Delaware. The Christina Basin program is trying to coordinate information on releases coming from Pennsylvania.*

- SHOULD NON-SDWA REGULATED CONTAMINANTS BE PART OF THE STATE'S SWAP PROGRAM?

*Mr. Demul remembered that at the last meeting, it was suggested and agreed upon to use the SDWA regulations as a guideline. Also, Mr. Barndt agreed that although Chryptosporidium is not currently regulated, it will most likely be regulated very soon and should be included in the DE SWAP plan. Mr. Kauffman suggested radon be added. Mr. Kraeuter asked at what level chloride should be regulated. Mr. Barndt agreed that chloride and saltwater intrusion should be included. Ms. Stulir stated that drinking water priority lists should be considered. Dr. Campbell stated that he thought information should be distributed state-wide about unregulated contaminants.*

*Mr. Barndt and Ms. Stulir discussed the Cathcart Bill that just passed in Delaware that dealt with unregulated maximum contaminant levels for secondary contaminants.*

*Mr. Kraeuter expressed concern that this program may be too inclusive. There are over 50,000 chemicals in existence and they do not all require regulation. Dr. Campbell recommended a textbook that contained information on water contamination. He noted that the World Health Organization might also be able to provide information on clean water that could be useful to the CTAC. Mr. Reinhold wondered if DNREC had an idea of what contaminants are manufactured in large quantities in DE that may soon be regulated. Ms. Stulir stated that radon may soon be regulated.*

- SHOULD DELAWARE PARTITION SOURCEWATER PROTECTION AREAS FOR GROUNDWATER AND/OR SURFACE WATER SOURCES FOR MORE FOCUSED SOURCE INVENTORIES? WHAT SHOULD BE THE BASIS FOR SUCH PARTITION?

*Several committee members commented that the groundwater/surface water partition was already rather focused. Mr. Smailer commented on unregulated heating oil tanks and asked if the CTAC thought that a higher level of detail was necessary. Mr. Barndt reiterated that time-of-travel may be used to delineate groundwater and buffer zones and time-of-travel from upstream may be used to delineate surface water. DNREC will also work with farmers with feedlots that may be a contaminant source within a wellhead area. Mr. Wollaston stated that the answer to this question is "Yes," and it is proposed that there should be three levels of investigation for surface water: the watershed, the buffer zone, and steep slopes and floodplains. Wellhead and recharge areas will be inspected as part of the groundwater investigation. Mr. Desrosier expressed concern about groundwater protection in southern Delaware.*

*A committee member stated that higher priorities might be placed on surface water due to its susceptibility to contaminants. Mr. Kauffman used the question to describe how data is presented. In the SWAP draft plan, data is separated into groundwater and surface water contaminant sources. Mr. Kraeuter said that the sources are the same for both water systems, by and large. Mr. Barndt agreed that more work has been done in NCC than in the lower part of the state. Mr. Talley explained that this has mostly been due to priorities set by the politicians. Local leaders in NCC have commissioned the studies that are providing this information. Since few studies have been commissioned in Kent and Sussex counties, little information is available.*

- HOW SHOULD DELAWARE DEFINE AND IDENTIFY SIGNIFICANT POTENTIAL CONTAMINANT SOURCES AND HOW SHOULD THE STATE UNDERTAKE THEIR INVENTORY WITHIN SOURCE WATER PROTECTION AREAS?

Mr. Barndt explained that the approach presented is the Whole Basin Approach. In the next 2 years, the entire state will have been surveyed.

*Mr. Demul returned to the database presented earlier by Steve Williams. He wondered why there seemed to be so much space on the DE map without information on possible contamination sources. Mr. Smailer explained that the spaces represent areas where information has not yet been compiled or has been compiled but has not yet been added to the database. Currently sites like poultry houses are listed as potential sources of contamination. A representative from the Council of Farm Organizations expressed concern that database entries do not differentiate among the sizes of businesses. For instance, one entry may represent 1 farm or 6 farms. Mr. Smailer agreed that only the ones documented are included in the database. And it is updated as more information is made available.*

*Mr. Kauffman stated that the significant sources would be determined by factors such as a water supply's proximity to a contamination source and population at risk will be considered. Dr. Campbell asked if the tourist population was taken into consideration. Mr. Smailer answered that they are considered in the categorizing of wells as transient/non-community such as rest-stops, restaurants, and campgrounds.*

## ***V. NEXT STEPS/NEXT MEETING***

Mr. Brown again asked that all comments be sent to WRA as soon as possible. The next meeting will be November 18, 1998 at the Department of Public Safety Conference Room in Dover.

## **VI. ATTENDEES TO THIS CTAC MEETING**

### Committee members in attendance:

|   |  |
|---|--|
| American Association of Retired Persons (AARP)                                | Frank Desrosier<br>Joseph Demul  |
| Artesian Water Company  | Joseph DiNunzio  |
| City of Dover   | Anthony Gersitz  |
| Committee of 100/Duffield Associates  | Jeff Bross   |
| Committee of 100/Tetra Tech   | Tad Yancheski  |
| Council of Farm Organizations   | Fowler Mitchells (representing Janet Mitchell)   |
| Delaware Department of Agriculture  | A. Grier Stayton (representing Scott Blair)  |
| Delaware Department of Natural Resources<br>and Environmental Control (DNREC) | John Barndt (Water Supply Section)<br>Hassan Mirsajadi (Watershed Assessment)<br>Steve Smailer (Water Supply Section)<br>Stephen Williams (Whole Basin Management) |
| Delaware Farm Bureau  | Pam Thornburg  |
| Delaware Geological Survey  | John Talley  |
| Delaware Nature Society   | Chris Brown  |
| Delaware Public Health Association  | Eugene Campbell, MD  |
| Delaware Rural Water Association  | Jigar Patel  |
| Office of Drinking Water  | Donna Stulir (representing Anita Beckel)   |
| Town of Lewes, Board of Public Works  | Gilbert Holt   |
| US Environmental Protection Agency (EPA)<br>Region III                        | Dale Long (representing Ashley Toy)  |
| United Water Delaware   | Sheila Dolan   |
| US Geological Survey (USGS)   | Judy Denver  |
| Water Resources Agency  | Jerry Kauffman<br>Martin Wollaston   |

Others is attendance:

Artesian Water Company

Delaware Department of Natural Resources  
and Environmental Control (DNREC)

Water Resources Agency

Bruce Kraueter

Doyle Brown

David Reinhold

Stewart Lovell (DWR-WSS)

Lesley McKnight

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT PROGRAM (SWAP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE (CTAC)

Delaware Department of Public Safety  
Conference Room  
Dover, Delaware

Wednesday  
November 18, 1998  
8:30 am - Noon

#### *I. ADMINISTRATIVE*

John Barndt, DNREC, served as the meeting chair. He welcomed committee members and asked all to introduce themselves. The attendees were asked to sign in when they arrived and make any changes to addresses as necessary. Mr. Barndt stated that each member should have received two packets by post within the last week. One packet contained the October meeting summary plus the agenda for the November meeting. The second mailing was the first draft of Chapter 5: Susceptibility Analysis. CTAC members were to have reviewed the meeting summary and the draft chapter for this meeting.

Dr. Eugene Campbell was unable to attend the meeting but, in his stead, Doyle Brown passed out a paper entitled "The Amazons, An Appreciation" that was written by Dr. Campbell in 1995.

On November 10, 1998, Mr. Barndt, and Jerry Kauffman, Martin Wollaston and Lesley McKnight, WRA, attended the EPA regional SWAP meeting held in Martinsburg, WV. At that meeting, several states distributed copies of their draft SWAP plans to be used as reference for the other states. Also, EPA explained the approval procedure for the SWAP plan. Delaware's draft will be submitted in February. If all EPA's criteria are met, it will send a letter to Delaware acknowledging receipt of the draft plan. EPA then has 9 months to review the plan and provide comments. Mr. Barndt recommended that the committee meet again at that time to discuss EPA's recommendations. (There will be no need for the committee to meet from the time the plan is submitted until EPA's comments are received.)

Mr. Barndt then asked for comments on the October 14 Meeting Summary. There were changes recommended by Pam Thornburg, Delaware Farm Bureau and Jigar Patel, Delaware Rural Water Association. Also, John Talley, DGS, and Steve Smailer, DNREC, asked to be allowed to provide written comments that pertained to their talks only. A motion to accept the summary with the changes was made by Gilbert Holt, Town of Lewes; seconded by Anthony Gersitz, City of Dover, and unanimously approved. Copies of the revised minutes will be distributed at the December meeting. The October meeting summary will be posted to the website once all changes have been made. Mr. Barndt expressed concern that committee members are not providing written feedback on the draft chapters presented thus far. A questionnaire will also be sent so that CTAC members may easily provide comments

## **II. CHAPTER 4: CONTAMINANT SOURCE INVENTORY**

Mr. Kauffman presented a review of Chapter 4. Comments from the October meeting had been incorporated. The slides used in the presentation are attached to this meeting summary.

As suggested, the Contaminants of Concern now include the list of contaminants considered by Delaware's Office of Public Health. Cryptosporidium has also been included since EPA will soon be regulating it. *Ashley Toy, EPA, recommended that Giardia also be included. Several members agreed that Radionuclides should be included in place of Radon, as Radon is an airborne particle. Marion Stewart recommended that an appendix be included in the plan that explains all technical terms and spells out all acronyms.*

Mr. Kauffman also discussed the plan's identification of Significant Sources of Contamination. He explained that the matrix approach and best professional judgement will both be used. The committee's feedback is especially needed for the identification criteria. The plan will call for the mapping of land uses and potential contamination sources. Delaware will receive much information by coordinating with Pennsylvania through the Christina Basin program.

## **III. CHAPTER 5: SUSCEPTIBILITY ANALYSIS**

Mr. Barndt began the presentation of Chapter 5 to the committee. He explained that susceptibility is a new requirement by EPA and they have therefore been providing much written guidance. EPA expects Delaware to make the susceptibility analysis available to the public for each public water system.

Delaware will be expected to provide a definition of sensitivity (or what some states are calling vulnerability). There was much discussion by the committee as to whether Delaware should use the term "sensitivity" or "vulnerability." It was decided that Delaware would use the term "vulnerability." In the draft plan, the word "sensitivity" will be changed to "vulnerability."

Mr. Barndt then reviewed the Vulnerability Determination Flow Chart. Mr. Talley and Ms. Toy discussed the definition of GWUDI, or Ground Water Under the Direct Influence of surface water. *Lloyd Hughes, AARP, asked how, using this chart, wells with saltwater intrusion would be handled. Mr. Barndt responded that saltwater intrusion should not affect properly constructed wells (well integrity), but that it could be considered as additional criteria. Mr. Smailer added that wells with poor integrity, which would be subject to saltwater intrusion, would be labeled "High Sensitivity" using the flow chart. Mr. Talley explained that public wells along the Atlantic Coast (beach) and Delaware Bay are usually relatively deep and are constructed in confined aquifers which render them much less susceptible to saltwater contamination from surface or near-surface sources of saltwater. The DGS has defined areas where saltwater is a problem, even in deep wells. (Editor's Note: Saltwater intrusion refers to the entrainment*

of saltwater by a pumping well. A related problem is when coastal areas flood and the top of the well is inundated by floodwater. The latter involves well integrity.)

*Dave Reinhold, DNREC, questioned whether all surface water should be treated equally with respect to contaminants. Mr. Wollaston asked if pumpage should be included in the vulnerability analysis. Both Mr. Barndt and Mr. Smailer responded that pumpage will be handled through delineation.*

*Mr. Holt noted that the public might be concerned if their wells are found to be vulnerable. Betsy Rogers, Tetra tech, Inc., expressed concern about the end result of well labeling. Several committee members agreed that clean water is important and they want the recommendations to have integrity. Mr. Smailer explained that not all wells that will be considered vulnerable would also be considered susceptible to contamination. Mr. Talley explained that the information on vulnerability would also be used to protect the groundwater quality by assisting authorities in making land use decisions. Mr. Barndt explained that the EPA cannot mandate land use, but that the SWAP plan will provide a way to facilitate proper land uses.*

*There was much discussion by the committee as to whether the last criteria, separating wells screened above and below 150 feet, should be used. John Talley communicated that less than 5% of the wells in Delaware are screened below 150 feet.*

*Several committee members agreed that the flow charts should contain footnotes that refer back to the narrative of the chapter. They do not want the charts to be taken out of context. Also, several committee members felt that some flexibility should be integrated into the flow charts to allow for engineering data and professional judgement.*

*Mr. Smailer then explained the susceptibility chart, using a well in Seaford as a groundwater example. Jeff Bross, Duffield Associates, asked how LUSTs (Leaking Underground Storage Tanks) would be handled. Mr. Smailer explained that USTs are considered potential sources of contamination and LUSTs are considered known sources of contamination. Mr. Bross questioned why even include an UST when it has been removed and the site has been cleaned up.*

*Mr. Smailer also explained the point source and nonpoint source ratings being proposed. Mr. Talley asked if these ratings will be tested. Mr. Smailer answered that if the committee approves of the ratings system, several wells will be used as examples to test the process. Examples will be included in the SWAP plan. The committee was asked to consider if they have any wells they would like used as test cases.*

*Mr. Smailer then explained how the susceptibility chart will cross-reference the vulnerability rating with the contaminant source ratings to determine the susceptibility of each drinking water source. Ms. Rogers asked if all the states were determining susceptibility this way. Mr. Barndt explained that many states, such as New York, are using similar methods. EPA, at the Martinsburg, WV meeting, noted New York's plan as a good example.*

The committee was asked how they felt the information should be released. *Mr. Wollaston recommended sending out questionnaires to the CTAC asking how the source water assessments should be disseminated to the public. Ms. Stewart noted that WILMAPCO sends out their information in several different levels of detail. Mr. Smailer observed that the agenda of the December CTAC meeting will include public participation and information dissemination.*

Mr. Kauffman then presented a surface water example, using the City of Newark's Surface Water Treatment Plant. *Ms. Rogers asked why surface water was compared to MCL levels and groundwater will be compared to background levels. Mr. Kauffman explained that groundwater contamination levels are detected using MCLs because contaminants in groundwater have a longer time-of-travel and it is important to detect these contaminants at lower levels. Maryland currently uses 50% MCL level as the cutoff, and this is a possibility in Delaware. Mr. Talley asked about natural-occurring contaminants such as iron. Mr. Kauffman agreed that contaminants could be labeled primary and secondary. Ms. Rogers asked about wells that were once contaminated and have been cleaned up. Mr. Kauffman agreed that best professional judgement could be used in these cases. Sheila Dolan, United Water Delaware, asked if information could be included about which wells are treated before consumption.*

*There was much discussion about who and what should be included in the "population served" category. The term currently includes only residential users. Mr. Bross suggested that commercial users should also be included.*

*There was also much discussion about whether areas that had been cleaned up should be listed on the form. Some suggested that they still be listed, but that it be noted that they are no longer a problem. Others recommended that these sites not be included at all. It was noted that Pennsylvania sites were not included, as this information is not available at this time.*

#### **IV. DISCUSSION OF KEY SWAP QUESTIONS**

Doyle Brown presented the following question to the committee for their input. He requested that the committee provide responses in writing to the Water Resources Agency.

- HOW WILL DELAWARE CONDUCT SUSCEPTIBILITY ANALYSES FOR SOURCE WATER AREAS?

The committee agreed that this question had mostly been answered through the discussion of the draft Chapter 5. *Ms. Stewart asked who would be filling out the susceptibility analysis forms. Mr. Barndt responded that the funding of this work is underway, but that staff is being hired to work on this project. This project is funded for*

*at least seven years. In addition, the contaminant inventory is currently being completed by DNREC under the Whole Basin Assessment.*

*Mr. Bross reiterated his concern that the analyses incorporate a way for best professional judgment to be used if the susceptibility analysis returns an inappropriate verdict. Mr. Wollaston explained that the committee's input is extremely valuable in the area. It appears from the committee's comments that they generally approve of the approach, with some recommended refinements. This program will be presented again in December and the committee will be given the opportunity to vote to approve this program. Several water supply representatives agreed that this report will provide assistance in creating the Consumer Confidence Reports that the water systems must prepare for their customers.*

*Several committee members did express concern that the public might misunderstand the terms used in the plan to describe the water systems. The committee discussed the possibility of using a numerical rating system for vulnerability and susceptibility analysis.*

#### **V. NEXT STEPS/NEXT MEETING**

Mr. Wollaston asked the committee which dates and times they would prefer to hold the public workshops in January, whether 2 or 3 workshops should be held, and whether the format should be workshops or public hearings. *The committee discussed providing the media with some information about the SWAP program design before the public workshops.*

Lunch was served to the committee immediately following the meeting. The committee then toured the City of Dover water system. The tour included the water treatment plant, storage tank, and wells. Vans were provided to transport the committee from the conference room to the site.

The next meeting will be December 16, 1998 at the Department of Public Safety Conference Room in Dover.

#### **VI. ATTENDEES TO THIS CTAC MEETING**

##### Committee members in attendance:

|  |   |
|--|---|
| American Association of Retired Persons (AARP) | Lloyd Hughes (representing Frank Desrosier) |
| Artesian Water Company                         | Joseph DiNunzio                             |
| City of Dover                                  | Anthony Gersitz                             |
| Christina Conservancy                          | Lorraine Fleming                            |
| Civic League for New Castle County             | Marion Stewart                              |
| Committee of 100/Duffield Associates           | Jeff Bross<br>Tim Ruga                      |

Committee of 100/Tetra Tech  
Delaware Department of Agriculture  
Delaware Department of Natural Resources  
and Environmental Control (DNREC)  
Delaware Farm Bureau  
Delaware Geological Survey  
Delaware Nature Society  
Delaware Rural Water Association  
Office of Drinking Water  
Town of Lewes, Board of Public Works  
US Environmental Protection Agency (EPA)  
Region III  
United Water Delaware  
US Geological Survey (USGS)  
Water Resources Agency

Betsy Rogers (representing Tad Yancheski)  
Scott Blair  
John Barndt (Water Supply Section)  
Steve Smailer (Water Supply Section)  
Pam Thornburg  
John Talley  
Chris Brown  
Jigar Patel  
Barbara Blaier (representing Anita Beckel)  
Gilbert Holt  
Ashley Toy  
  
Sheila Dolan  
Dan Soeder  
Jerry Kauffman  
Martin Wollaston

Others in attendance:

Artesian Water Company  
Delaware Department of Natural Resources  
and Environmental Control (DNREC)  
Water Resources Agency

Nancy Parker  
Doyle Brown  
David Reinhold  
Lesley McKnight

# WELCOME

Delaware SWAP  
Citizen and Technical Advisory  
Committee (CTAC) Meeting

Dover, Delaware  
November 18, 1998

## SWAP CTAC Meeting Agenda

- I. Administrative
- II. Contaminant Source Inventory (Ch. 4)
- III. Susceptibility Analysis (Ch. 5)
- IV. Key SWAP Questions
- V. Next Steps/Next Meeting
  - Field Trip Briefing

## Ch. 4 Contaminant Source Inventory

- Contaminants of Concern
- Existing GIS Data
- Ground/Surface Water Methodology
- “Significant” Contaminant Sources

### Contaminants of Concern

- DE Drinking Water Regs. (MCL's)
- Metals (Pb, Hg, etc.)
- Inorganics (Chloride, Iron, etc.)
- Organics (Benzene, etc.)
- Pesticides/Herbicides
- Bacteria
- Chryptosporidium

## Nonpoint Contaminant Sources

- Agriculture
- Construction
- Urban Runoff
- Land Disposal
- Stream Modification
- Spills/Atmos. Deposition

## Point Source Contaminants

- NPDES Wastewater Discharges
- Superfund Sites/Landfills
- Combined Sewer Overflows (CSO's)

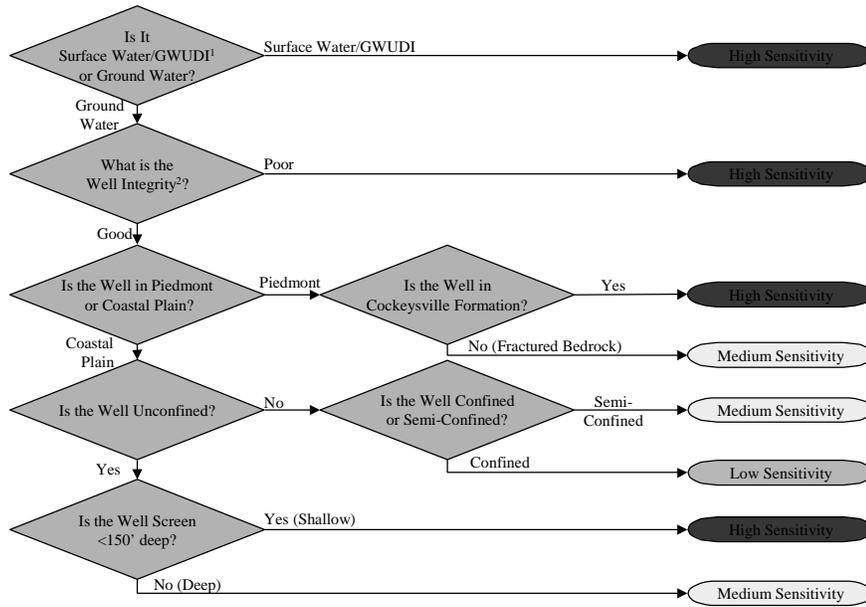
## Significant Sources of Contamination

- Sites within Source Water Areas
- Factors (Risk, Toxicity, Population, etc.)
- Contaminant Classes (Metals, Organics etc.)
- Animal Feedlots, Fertilizer, UST
- Septic Systems
- Hazardous Waste/Superfund Sites
- Saltwater Intrusion

## Ch. 5 Susceptibility Analysis

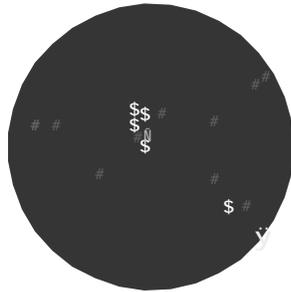
- Definition of Sensitivity
- Definition of Susceptibility
- Surface Water Sources
- Groundwater Sources in Coastal Plain
- Groundwater Sources in Piedmont
- Susceptibility Assessment Methodology

## Sensitivity Determination



1 - GWUDI = Ground Water Under the Direct Influence of Surface Water (i.e. well located very close to a surface water body)  
 2 - Well Integrity = The physical well construction if known, or an assumption based upon the effective date of 1969 for the State's Well Regulations

# Discrete Point Sources



- Discrete Sources
- Animal Operations
  - ▮ Hazardous Waste Generators
  - ▮ Pesticide Loading, Mixing & Storage
  - △ TRI
  - # Underground Storage Tanks
  - Wellhead Area

# Individual Source Rating

| Contaminant Category              | Discrete Sources                      |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
|-----------------------------------|---------------------------------------|-------------------------|---|----------------------------|-------------------|--------------|----------------|-------------------------------------|---------------|--------------|-----|--------------------|------------------|------------|-----|-----|
|                                   | Animal Operations                     | Combined Sewer Overflow | Dredge Spoil  | Hazardous Waste Generators | Landfills & Dumps | Large Septic | NPDES Outfalls | Pesticide Loading, Mixing & Storage | Salvage Yards | Small Septic | SRB | Sludge Application | Spray Irrigation | Tire Piles | TRI | UST |
| Nutrients                         |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Bacteria                          |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Petroleum Hydrocarbons            |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Organics                          |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Pesticides                        |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| PCBs                              |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Sediments/Turbidity               |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Disinfection Byproduct Precursors |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Metals                            |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Inorganic                         |                                       |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Negligible                        | 0 Not Applicable                      |                         | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in this media in the event of a release. |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Low                               | 1 Present - No or Minimal Releases    |                         | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases to this media at levels of concern. |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Medium                            | 2 Potentially Present - No Monitoring |                         | Substance could be present at levels of concern. No or insufficient monitoring of this media.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| Medium                            | 3 Present - No Monitoring             |                         | Substance present in significant quantities onsite. No monitoring of this media.  |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| High                              | 4 Permitted Discharge                 |                         | Substance discharged under permit. Monitoring generally required.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| High                              | 5 Onsite Contamination                |                         | Substance present onsite at levels of concern in this media. Unpermitted discharge.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| High                              | 6 Offsite Contamination               |                         | Substance present offsite at levels of concern in this media. Unpermitted discharge.  |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |



# All Identified Sources



## Susceptibility Determination

|                           |        |                                  |        |        |        |          |
|---------------------------|--------|----------------------------------|--------|--------|--------|----------|
| <b>Sensitivity Rating</b> | HIGH   | LOW                              | MEDIUM | HIGH   | HIGH   | HIGH     |
|                           | MEDIUM | LOW                              | LOW    | MEDIUM | HIGH   | HIGH     |
|                           | LOW    | LOW                              | LOW    | LOW    | MEDIUM | HIGH     |
|                           |        | NEGLECTIBLE                      | LOW    | MEDIUM | HIGH   | EXISTING |
|                           |        | <b>Contaminant Source Rating</b> |        |        |        |          |

**TABLE 5-4**  
**SOURCE WATER SUSCEPTIBILITY ASSESSMENT (EXAMPLE)**  
**Delaware Source Water Assessment and Protection Program**

|   |  |
|---|--|
| <b>I. BACKGROUND DATA</b>   |  |
| 1. Name: <u>  <b>Mary Waters</b>  </u>  | 2. Date: <u>  <b>November 12, 1998</b>  </u> |
| 3. Source Water: <u>  <b>City of Newark Surface Water Treatment Plant</b>  </u> |  |
| 4. Surface Water (SW) or Ground Water (GW): <u>  <b>Surface Water</b>  </u>     |  |
| 5. Whole Basin: <u>  <b>Piedmont</b>  </u>                                      | 6. County: <u>  <b>New Castle</b>  </u>      |
| 7. DNREC ID: _____  | 8. DGS ID: _____                             |
| 9. Latitude/Longitude: _____  |  |

|   |                       |                                 |                 |
|---|-----------------------|---------------------------------|-----------------|
| <b>II. INFLUENCES OF HUMAN ACTIVITY</b>   |                       |                                 |                 |
| <i>List Contaminants of Concern where monitoring indicates contamination above background levels in raw water supply.</i> |                       |                                 |                 |
| 10. <u>Contaminant</u>  | 11. <u>MCL (mg/l)</u> | 12. <u>Concentration (mg/l)</u> | 13. <u>Date</u> |
| <b>Zinc</b>   | <b>5</b>              | <b>0.315</b>                    | <b>Jan 1996</b> |

|   |  |
|---|--|
| <b>III. HYDROGEOLOGIC SENSITIVITY</b>                   |  |
| <i>If surface water system, answer questions 14-16.</i> |  |
| <i>If groundwater system, answer questions 17-20.</i>   |  |
| 14. Watershed Type: _____                               | <u>  <b>White Clay Creek Watershed</b>  </u> |
| 15. Capacity (mgd): _____                               | <u>  <b>3</b>  </u>                          |
| 16. Population Served: _____                            | <u>  <b>36,000</b>  </u>                     |
| 17. Aquifer Type: _____                                 | _____  |
| 18. Capacity (mgd): _____                               | _____  |
| 19. Population Served: _____                            | _____  |
| 20. Depth of Well (ft.): _____                          | _____  |

**IV. POTENTIAL SOURCES OF CONTAMINATION**

*List the sites within the Wellhead, Cockeysville, or Watershed area and note within which area the source resides.*

21. Circle one: Wellhead Area      Cockeysville Area      Watershed Area

22. NPDES Wastewater Discharges

**PA52451      Francis L. Hamilton Oates STP**  
**PA40436      Chadds Ford Investment Co/ Red Fox GC**  
**PA29343      Chatham Acres**  
**PA54356      Getty Petroleum Corporation**

**PA52019      Avon Grove Trailer Court**  
**PA25488      Avondale Borough Sewer Authority**  
**PA24066      West Grove Borough Authority STP**  
**PA53783      Avon Grove School District**

23. Superfund Sites

**DE-052      Newark Housing Authority Landfill**  
**DE-1049      DuPont Louviers – MBNA**  
**DE-214      Gore W.L. Association Inc. – Newark**  
**DE-1050      DuPont Louviers - Gore**

24. Leaking Underground Storage Tanks

**3000-515      Louviers Country Club**  
**3000-515      Louviers Maintenance Yard**  
**3000-515      Louviers CC Equipment Center**  
**3000-515      MBNA Milford Crossroads Clubhouse**  
**3081-719      Wm. Taylor Residence**

25. Hazardous Waste Sites

26. Tire Piles

27. Solid Waste Landfills

**New Garden Township (I)**  
**London Grove – West Grove (I)**  
**SECCRA Landfill (A)**

28. Land Use (sq. mi. / %)

|                              |              |           |            |   |
|------------------------------|--------------|-----------|------------|---|
| Agriculture                  | <u>34.34</u> | sq. mi. / | <u>49</u>  | % |
| Residential                  | <u>10.35</u> | sq. mi. / | <u>15</u>  | % |
| Office/Industrial/Commercial | <u>1.76</u>  | sq. mi. / | <u>3</u>   | % |
| Open Space Wooded            | <u>22.80</u> | sq. mi. / | <u>33</u>  | % |
| <hr/>                        |              |           |            |   |
| TOTAL                        | <b>69.25</b> | sq. mi. / | <b>100</b> | % |

V. WELL INTERGRITY

29. Date well was installed: \_\_\_\_\_

30. Was well installed before Delaware Well Drilling Regulations were passed in 19?? (Circle one): Yes No

VI. SUSCEPTIBILITY TO CONTAMINATION

*Determination should be made based on Tables 5-1, 5-2, or 5-3.*

31. High or Low: High

THANK YOU TO THE  
DELAWARE SWAP  
Citizen and Technical Advisory  
Committee (CTAC)

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT PROGRAM (SWAP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE (CTAC)

Delaware Department of Public Safety  
Conference Room  
Dover, Delaware

Wednesday  
December 16, 1998  
8:30 am - Noon

#### ***I. ADMINISTRATIVE***

John Barndt, DNREC, served as moderator for the meeting. A first draft of the Source Water Assessment Plan (SWAP), dated December 16, 1998, was distributed which included appendices. Mr. Barndt thanked the City of Dover and United Water Delaware for scheduling and conducting tours of their respective water facilities.

The meeting summaries from previous meetings were discussed. There were two changes to the November minutes introduced by John Talley. Gilbert Holt, Town of Lewes, moved that the November summary be accepted and Lorraine Fleming, Christina Conservancy, seconded the motion. The committee then approved the November meeting summary as revised.

#### ***II. CHAPTER 5: SUSCEPTIBILITY ANALYSIS***

Steve Smailer, DNREC, presented an example of a susceptibility determination of a groundwater-based water system using a location in Delaware, labeled Medium Town. This analysis will be performed on each of the groundwater systems in Delaware. The process will be based on key questions and the susceptibility will be based on the answers. Wells can be considered to have "High", "Medium", or "Low" vulnerability based on the geological conditions of the water system and the construction and screening of the well itself. The wellhead area will then be inspected based on existing or potential contamination sources. The wellhead area will be given a rating 0 to 6 for each type of contaminant based on the results of the investigation. The numbers will be translated into the labels "High", "Medium", "Low" or "Negligible". The contamination potential will then be cross-referenced with the vulnerability to determine the susceptibility of the well to each type of contaminant.

*Several committee members discussed contaminant time-of-travel, contaminant transportation routes, and the effect well pumpage may have on it. Some members wanted this taken into consideration in the vulnerability determination. Mr. Smailer explained that 5-year time-of-travel of contaminants is used in the assessment. The wellhead area is based on the well pumpage. As the well use changes, the wellhead area and time-of-travel will also change. Dave Reinhold, DNREC, questioned how transportation routes such as railroad tracks and highways would be assessed. Mr. Smailer agreed that each site was different, but that the committee could decide how, in general, transportation routes would be assessed. The committee did agree that the type*

*of transportation should be included in each assessment.*

*Mr. Reinhold also questioned whether the state has the data, labor and financial resources for such in-depth studies of each well. Mr. Smailer reiterated that some of this work has already been done under the Whole Basin Program. Both Mr. Smailer and Mr. Barndt believe that the resources available are adequate and agreed to include a timeline in the SWAP.*

*During the discussion of Table 5.3-Land Use Designations, Pam Thornburg, Delaware Farm Bureau, expressed concern that the plan is using the assumption that nitrates come from farms. She was concerned that the potential for nutrient contamination from cropland was rated “High” and that this designation does not differentiate between operations that do or do not employ “Best Management Practices.” Chris Brown, Delaware Nature Society, requested that all assumptions made should be cited in the plan.*

Next, Jerry Kauffman, WRA, discussed the susceptibility evaluation process for surface water sources. First, he provided an explanation of why all surface water sources will be considered highly vulnerable. Compared to groundwater sources, surface waters have faster contaminant travel times, surface waters are open to air, and there is lesser attenuation mechanism. Mr. Kauffman then provided a sample analysis using the City of Newark’s White Clay Creek intake.

*Kent Bacon, Culligan Water Conditioning, asked about the sampling methodology of surface water. Hassan Mirsajadi, DNREC, explained that water samples are taken 1 foot below the water surface and sediment samples are taken from the riverbed.*

Mr. Barndt then walked the committee through the written Chapter 5: Susceptibility Analysis.

*Several of the water suppliers who are members of the committee expressed concern that the public may misunderstand the intent if the surface water sources are assessed as having “High Susceptibility” and discussed the public’s possible reactions. Jeff Bross, Duffield Associates, Joe Dinunzio, Artesian Water, and Shiela Dolan, United Water Delaware, explained that they and other water suppliers had met separately prior to this CTAC meeting to discuss the susceptibility assessment being proposed. They all preferred a numerical rating system to the “High,” “Medium” and “Low” designations currently being presented.*

### **III. PUBLIC PARTICIPATION**

*Several committee members expressed concern that the public may have difficulty understanding the difference between vulnerability and susceptibility. Alternatives were offered but the committee chose to stay with the two terms currently in the draft SWAP. The committee agreed that graphics and definitions of these terms would be essential. An executive summary of the plan was also discussed.*

*The committee discussed whether potential sources of contamination should be included in the assessments if they had already been deemed clean by the EPA or by DNREC. The committee decided that sites that had been remediated would be included in the assessments in order to track the progress of the sites, but another column would be added that noted its status.*

*The committee also considered whether or not the general public should be presented the draft the SWAP if the CTAC committee was still discussing the specifics of the vulnerability determination and susceptibility analysis. It was decided that the committee would meet again on January 6, 1999 to make decisions on these issues. A packet of all written comments received to date will be sent to committee members prior to that meeting. The committee will also meet on January 13, 1999 to review changes made at the January 6 meeting and for final comments on the entire draft SWAP document. The public workshops will be held during the week of January 18, 1999. One workshop will be held in Milford, DE, a central location for citizens of Kent and Sussex Counties. The second workshop will be held in a location central to all New Castle County.*

*The committee also discussed the format of the public workshops. It was decided that a less structured meeting was best for allowing the public to make comments.*

#### **IV. NEXT STEPS/NEXT MEETING**

The committee will meet on January 6, 1999 to review the Susceptibility Analysis chapter and on January 13, 1999 for final review of the SWAP plan before it is presented at the public workshops.

#### **V. ATTENDEES TO THIS CTAC MEETING**

##### Committee members in attendance:

|  |   |
|--|---|
| American Association of Retired Persons (AARP)                             | Frank Desrosier                               |
|  | Joseph Demul                                  |
| Artesian Water Company   | Joseph DiNunzio                               |
| City of Dover  | Anthony Gersitz                               |
| Christina Conservancy  | Lorraine Fleming                              |
| Committee of 100/Duffield Associates                                       | Jeff Bross                                    |
|  | Tim Ruga                                      |
| Committee of 100/Tetra Tech  | Elizabeth Rogers (representing Tad Yancheski) |
| Council of Farm Organizations  | Lowder Mitchell (representing Jane Mitchell)  |
| Culligan Water Conditioning  | Kent Bacon                                    |
| Delaware Department of Agriculture   | Scott Blaier                                  |
| Delaware Department of Natural Resources and Environmental Control (DNREC) | John Barndt (Water Supply Section)            |
|  | Hassan Mirsajadi (Watershed Assessment)       |

Delaware Farm Bureau  
Delaware Geological Survey  
Delaware Nature Society  
Delaware Public Health Association  
Delaware Rural Water Association  
League of Women Voters  
Office of Drinking Water  
Town of Lewes, Board of Public Works  
US Environmental Protection Agency (EPA)  
Region III  
United Water Delaware  
Water Resources Agency

Steve Smailer (Water Supply Section)  
Steve Williams (Whole Basin Management)  
Pam Thornburg  
John Talley  
Chris Brown  
Eugene Campbell, MD  
Jigar Patel  
Til Purnell  
Anita Beckel  
Gilbert Holt  
Ashley Toy  
  
Sheila Dolan  
Jerry Kauffman  
Martin Wollaston

Others in attendance:

AARP  
Artesian Water Company  
  
City of Newark  
Delaware Department of Natural Resources  
  
US Environmental Protection Agency (EPA)  
Water Resources Agency

Lloyd D. Hughes  
Bruce Kraeuter  
Nancy Parker  
Joe Dombrowski  
Doyle Brown  
Stewart Lovell  
David Reinhold  
Andrea Bennett  
Lesley McKnight

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM (SWAPP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE (CTAC)

Delaware Department of Public Safety  
Conference Room  
Dover, Delaware

Wednesday  
January 6, 1999  
8:30 am - Noon

#### ***I. ADMINISTRATIVE***

John Barndt, DNREC, acted as facilitator for the meeting. He stated that the purpose of the meeting was to focus on comments received on the susceptibility approach outlined in Chapter 5. He asked attendees to introduce themselves. He then explained that two public workshops would be held to allow for the public to comment on the SWAP. The first workshop will be held from 5:00pm to 8:00pm on Tuesday, January 19, 1999 at the Milford High School Auditorium, a location convenient for Kent and Sussex County residents. A second meeting will be held at the new Bear Public Library on January 20, 1999 from 4:30pm to 7:00pm, a location convenient for New Castle County residents. Any interested citizens, regardless of where they live, are invited to attend either or both meetings. CTAC members are encouraged to attend both, if possible. Each public workshop will consist of short presentations of the SWAP proposal held periodically throughout the workshop. In between each presentation, the public will have an opportunity to voice their comments. Written comments will also be accepted.

*In December, a questionnaire posing specific questions about the SWAP was sent to each CTAC member. About a dozen responses have been received; all committee members were encouraged to take the time to fill out the questionnaire. It is very important that opinions of everyone on the committee be heard.*

On behalf of the EPA, Dale Long, EPA, thanked the committee for their hard work and input into developing Delaware's SWAP.

#### ***II. CHAPTER 5: SUSCEPTIBILITY ANALYSIS***

Steve Smailier, DNREC, reviewed an example of a susceptibility analysis of a ground water source. This is the same example he had provided previously and the graphics used are attached to this summary. Mr. Smailier explained that this analysis would be performed on each of the 1000 public system ground water sources in Delaware.

*Til Purnell, League of Women Voters, asked how permeability was factored in. Mr. Smailier responded that it was included in the wellhead modeling, which is based on the recharge area and 1997 land use data.*

*Several committee members again expressed concern that private (domestic) wells will not be included in the SWAP. They were concerned that the source water of domestic wells will not be protected. There were several suggestions that an explanation about private wells should be included in the SWAP. For instance, it could be noted in the Plan that domestic well owners could be directed to agencies that provide information on the contaminant source inventory of the area surrounding each private well. This information is currently available through DNREC. Various members of the committee suggested including this information in one of the following places: the introduction, an appendix, or a separate chapter. Definitions of both Public and Private (Domestic) Systems will also be included in the Glossary.*

*Joe Demul, AARP, expressed concern that contaminant sources will not be specifically identified. Mr. Smailer explained that this program is only an assessment of possible contamination sources and that investigations of specific sources may come later. Mr. Barndt noted that this is not a remediation-driven program but that other programs will use the information collected to prioritize their remediation program.*

*Joe Dombrowski, City of Newark, asked whether the Land Use characterization in Table 5.3 should be “Possible” and “Not Possible” rather than “High”, “Medium”, or “Low,” to be consistent with Table 5.2. The committee discussed this point at length and it was agreed that “Possible” or “Not Possible” would be used. Ashley Toy, EPA; Tim Ruga, Committee of 100; Dan Soeder, USGS; Scott Blaier, Delaware Department of Agriculture, and Sheila Dolan, United Water Delaware; all agreed to present default Land Use data for Table 5.3 at the next meeting. Bruce Kraeuter, Artesian Water Company, and many other committee members wondered whether those performing the assessment would be able to deviate from the default if conditions warranted. Mr. Smailer assured that flexibility and best professional judgement will be employed with each site characterization.*

Jerry Kauffman, WRA, presented an example of a susceptibility analysis of a surface water source. This, too, had been presented previously and the graphics used are attached.

*Mr. Kauffman reiterated that all surface water sources would be considered highly vulnerable, because compared to ground water sources, surface waters have faster travel times, and due to their inherent nature are open to the atmosphere. Mr. Dombrowski asked if water storage areas such as the Hoopes Reservoir would be considered highly vulnerable. Mr. Kauffman agreed that this point should be reviewed, and that existing monitoring data will be used for assessing susceptibility.*

*Throughout the meeting, the committee members discussed the susceptibility characterization employed of the labels “High”, “Medium,” “Low,” or “Negligible” used in Table 5.1. Some committee members preferred a numerical ranking system to using words, including Mr. Dombrowski, Mr. Dinunzio, Mr. Ruga and the AARP representatives. They were concerned about the public’s perception of surface water sources being labeled “High Susceptibility.” Mr. Dinunzio offered a numerical ranking*

system with a multiplication process used to determine susceptibility. Other committee members including Hilda Amacker, Clean Water Action, stated that they preferred the word designations. Ms. Beckel thought that the public would ask for explanations as to what the numbers meant. Hassan Mirsajadi, DNREC, suggested using both numeric and word classifications. After hearing the arguments, representatives of AARP and other committee members agreed that both numerical and word ranking systems should be used. All possibilities were discussed at length. Those writing the SWAP will consider all comments and propose a possible alternative at the next meeting. Mr. Smailer also agreed that the definitions for the terms used should be more geared toward the SWAP and Mr. Soeder agreed to help him with those definitions.

Several committee members asked whether NPDES discharges that meet their requirements should be considered to have medium, and not high, susceptibility. It was eventually decided that Mr. Smailer would discuss the issue with other DNREC staff that were involved in the site index database .

Mr. Kauffman asked the committee whether they had a preference of inventorying the entire watershed or just a designated area with a tiered approach. It was agreed that a tiered approach would be used.

Anita Beckel, Office of Drinking Water, expressed concern about using 50% MCL levels for the assessments. She suggested that 50% MCL levels were adequate for naturally-occurring contaminants, but inadequate for man-made contaminants such as organics and herbicides. Ms. Beckel suggested that detection limits be used instead for man-made chemicals. Mr. Krauter commented that naturally-occurring contaminants should not be part of these assessments since you can't do anything about them. Mr. Dombrowski noted that the program might not be able to protect the water systems against naturally-occurring chemicals. The committee debated whether naturally-occurring chemicals should be included in the assessment. It was eventually decided that they would be included.

Ms. Purnell asked what effect the dredging of the Delaware River would have on the SWAP. Mr. Smailer explained that this is addressed in the analysis. Mr. Barndt noted that unless dredge spoils were deposited in source water areas, this effort would likely not be particularly relevant to the source water program.

### **III. DRAFT SWAP DOCUMENT – DATED DECEMBER 16, 1998**

Mr. Demul wondered who the audience of the SWAP will be and whom it should be written for. Ms. Toy explained that the Plan is for the EPA, but should be written in plain language so that the public may understand and comment on it. Others noted that the public is the audience for the SWAP and the susceptibility assessments.

Martin Wollaston, WRA, asked which version of the draft SWAP should be disseminated at the public workshops. It was decided that the changes discussed at this meeting would

be made and discussed at the next meeting. A revised version of the December 16, 1998 Draft SWAP will be distributed at the public workshops.

Mr. Barndt told the committee that the workshops will be advertised in all the newspapers in the State of Delaware, and all 600 public water system owners will receive invitations to attend.

*The committee discussed at length as to how long written comments will be accepted from the public. It was concluded that comments would be accepted for 1 month from the date of the last public workshop. EPA agreed, providing the key pieces to the plan were not drastically altered.*

#### **IV. MISCELLANEOUS**

The committee will meet again on January 13, 1999 to review the draft of the SWAP that will be given to the public. Mr. Smailer will summarize the committee's comments on the susceptibility tables.

#### **V. ATTENDEES TO THIS CTAC MEETING**

##### Committee members in attendance:

|   |   |
|---|---|
| American Association of Retired Persons (AARP)                                | Frank Desrosier   |
|   | Joseph Demul  |
| Artesian Water Company  | Joseph DiNunzio   |
| City of Dover   | Sue Klindient (representing Anthony Gersitz)  |
| Civic League for New Castle County  | Marion Stewart  |
| Committee of 100/Duffield Associates  | Tim Ruga  |
| Common Cause  | John Flaherty   |
| Council of Farm Organizations   | Lowder Mitchell (representing Jane Mitchell)  |
| Delaware Department of Agriculture  | Scott Blaier  |
| Delaware Department of Natural Resources<br>And Environmental Control (DNREC) | John Barndt (Water Supply Section)<br>Hassan Mirsajadi (Watershed Assessment)<br>Steve Smailer (Water Supply Section) |
| Delaware Rural Water Association  | Jigar Patel   |
| League of Women Voters  | Til Purnell   |
| Office of Drinking Water  | Anita Beckel  |
| Town of Lewes, Board of Public Works  | Gilbert Holt  |
| US Environmental Protection Agency (EPA)<br>Region III                        | Ashley Toy  |
| US Geological Survey (USGS)   | Dan Soeder  |
| United Water Delaware   | Sheila Dolan  |
| Water Resources Agency  | Jerry Kauffman<br>Martin Wollaston  |

Others in attendance:

AARP

Artesian Water Company

City of Newark

Clean Water Action

Delaware Department of Natural Resources

New Castle Board of Water and Light

US Environmental Protection Agency (EPA)

Water Resources Agency

Lloyd D. Hughes

Bruce Kraeuter

Nancy Parker

Joe Dombrowski

Hilda Amacker

Stewart Lovell

Jason Miller

Chip Patterson

Dale Long

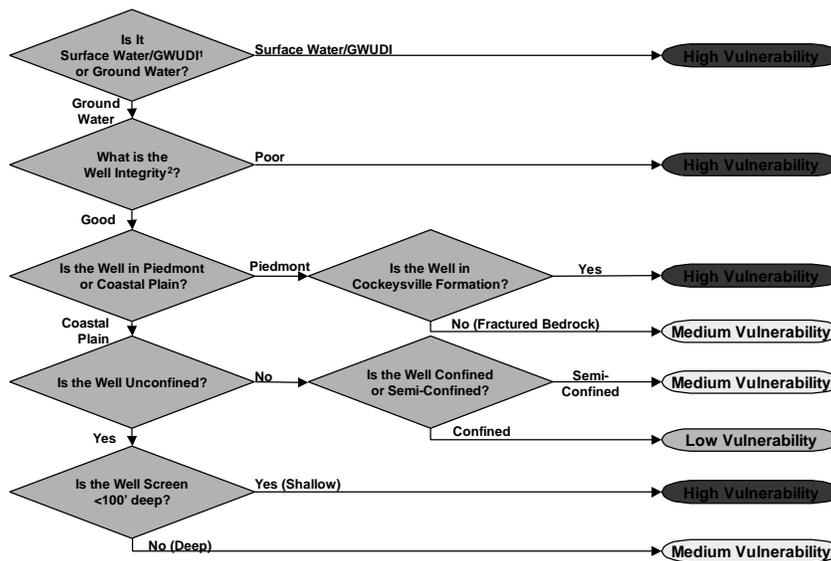
Lesley McKnight

# DELAWARE'S SOURCE WATER PROTECTION

CTAC Meeting

December 16, 1998

## Vulnerability Determination Process

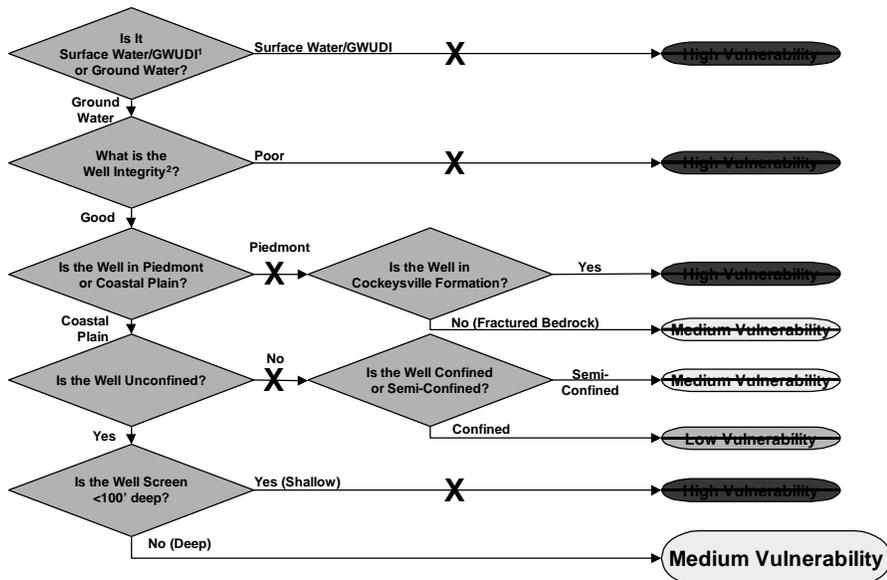


1 - GWUDI = Ground Water Under the Direct Influence of Surface Water (i.e. well located very close to a surface water body)  
 2 - Well Integrity = The physical well construction if known, or an assumption based upon the effective date of 1969 for the State's Well Regulations

## Medium Town Example - Well Characteristics

| MEDIUM TOWN (Wells # 2A & 3A) |                       |                       |
|-------------------------------|-----------------------|-----------------------|
| Well Characteristics          |                       |                       |
| FACILITY NAME                 | Medium Town Water     | Medium Town Water     |
| DNREC ID                      | 47006                 | 64384                 |
| SOURCE TYPE                   | well                  | well                  |
| LOCAL ID                      | 2A                    | 3A                    |
| LONGITUDE                     | 75 34 35.111629585    | 75 34 36.202656255    |
| LATITUDE                      | 38 27 38.107551175    | 38 27 39.157564694    |
| COUNTY                        | S                     | S                     |
| PWS TYPE                      | C                     | C                     |
| PWS ID                        | DE0000567             | DE0000567             |
| ALLOCATION NUMBER             | 89-0006B              | 89-0006A              |
| DATE DRILLED                  | 10/17/80              | 04/07/86              |
| CAPACITY                      | 1100                  | 750                   |
| DIAMETER                      | unknown               | 10                    |
| AQUIFER                       | bd                    | bd                    |
| MODGRID                       | 1020048               | 1020048               |
| BASIN                         | 307                   | 307                   |
| SCREEN INTERVAL               | 155-205               | 116-146               |
| WATER TREATMENT               | unknown               | unknown               |
| DGS ID                        | None                  | Rd31-15               |
| OWNER                         | Town of Medium        | Town of Medium        |
| USGS QUAD                     | Medium                | Medium                |
| WELLHEAD STATUS               | Preliminary WHPA Done | Preliminary WHPA Done |
| AQUIFER TYPE                  | unconfined            | unconfined            |
| DELINEATION METHOD            | MWC                   | MWC                   |
| CONTAMINANT INVENTORY         | Complete              | Complete              |

## Medium Town Example - Vulnerability Determination



### Medium Town Example - Discrete Source Inventory



### Site Index (Discrete Source) Contaminant Potential Rating

|  |   |         |            |   |           |                |
|--|---|---------|------------|---|-----------|----------------|
| Site Type:   | Type of Site (e.g., SIRB, LUST, solid waste, etc.)          |         |            |   |           |                |
| Site Name:   | Joe's Garage  |         |            |   |           |                |
| SiteID:  | N0001795  | Agency: | LUTS       |   |           |                |
| Status:  | Active  |         |            |   |           |                |
| County:  | Suzanne   | Basin:  | Chesapeake | Waterbody:  | Northlake |                |
| Location:  | X: 181,848.7  | Y:      | 78,418.7   | Location in GIS Base Plans<br>Coordinates PWS at intake |           |                |
| Comments:  | As the Remediation (Pump & Treat) Treatment system in place |         |            |   |           |                |
| Contaminant Source Potential Rating  |   |         |            |   |           |                |
|  | SW  | GW      | Soil       | Soil  | AV        | Chemical       |
| Nutrients  | 0   | 0       | 0          | 0   | 0         |                |
| Bacteria   | 0   | 0       | 0          | 0   | 0         |                |
| Petroleum  | 0   | 0       | 0          | 0   | 0         | BTEX, GRO, DRO |
| Organics   | 0   | 0       | 0          | 0   | 0         |                |
| PCBs   | 0   | 0       | 0          | 0   | 0         |                |
| Metals   | 0   | 0       | 0          | 0   | 0         | Lead           |
| Inorganics   | 0   | 0       | 0          | 0   | 0         |                |
| <small>Rating key: 0=Not Applicable, 1=Potential only/no releases, 2=Potentially preventable/no releases<br/>         3=Present (active monitoring), 4=Present (discharge), 5=Check (contaminated), 6=DTG (detect/track)<br/>         Note for: SW=Surface water, GW=groundwater, Soil=soil, Soil=soil</small> |   |         |            |   |           |                |

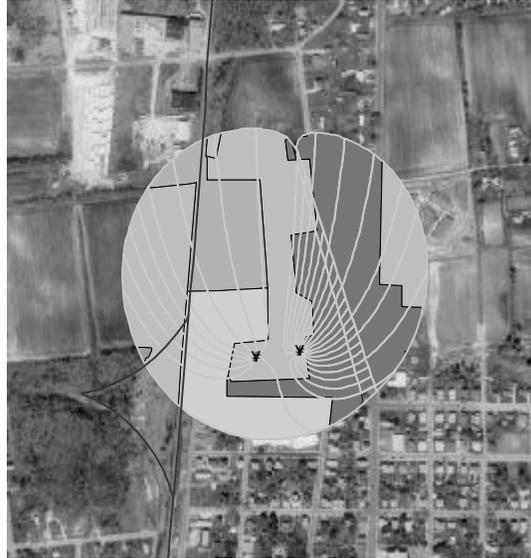
## Source Water Contaminant Potential Rating Classification

| Site Index Rating | Contaminant Potential Rating Definition    |   | Source Water Contaminant Potential |
|-------------------|--|---|------------------------------------|
| 0                 | <b>Not Applicable</b>                      | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in this media in the event of a release. | <b>Negligible (N)</b>              |
| 1                 | <b>Present - No or Minimal Releases</b>    | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases to this media at levels of concern. | <b>Low (L)</b>                     |
| 2                 | <b>Potentially Present - No Monitoring</b> | Substance could be present at levels of concern. No or insufficient monitoring of this media.   | <b>Medium (M)</b>                  |
| 3                 | <b>Present - No Monitoring</b>             | Substance present in significant quantities onsite. No monitoring of this media.  | <b>Medium (M)</b>                  |
| 4                 | <b>Permitted Discharge</b>                 | Substance discharged under permit. Monitoring generally required.   | <b>High (H)</b>                    |
| 5                 | <b>Onsite Contamination</b>                | Substance present onsite at levels of concern in this media. Unpermitted discharge.   | <b>High (H)</b>                    |
| 6                 | <b>Offsite Contamination</b>               | Substance present offsite at levels of concern in this media. Unpermitted discharge.  | <b>High (H)</b>                    |

## Medium Town Example - Discrete Source Inventory

| MEDIUM TOWN (Wells # 2A & 3A) CONTAMINANT POTENTIAL |                           |            |           |          |                |          |                        |          |            |          |   |
|---|---------------------------|------------|-----------|----------|----------------|----------|------------------------|----------|------------|----------|---|
| DISCRETE SOURCES                                    |                           |            |           |          |                |          |                        |          |            |          |   |
| SITE NAME   | SITE TYPE                 | STATUS     | NUTRIENTS |          | PATHOGENS      |          | PETROLEUM HYDROCARBONS |          | PESTICIDES |          | SITE COMMENTS                             |
|   |                           |            | GW        | COMMENTS | GW             | COMMENTS | GW                     | COMMENTS | GW         | COMMENTS |   |
| MEDIUM TOWN WATER TREATMENT FACILITY                | Underground Storage Tanks | INACTIVE   | N         |          | N              |          | L                      |          | N          |          | GWID: 0 FacDesc: Local Government Ret.    |
| JGRC INC  | Underground Storage Tanks | INACTIVE   | N         |          | N              |          | L                      |          | N          |          | GWID: 1 FacDesc: Commercial Ret. GASOLINE |
| DOMESTIC SEPTIC                                     | Residential               | 0.1 / Acre | L*        |          | M              |          | N                      |          | N          |          | 5 Residences                              |
| DISCRETE SOURCES (continued)                        |                           |            |           |          |                |          |                        |          |            |          |   |
| SITE NAME   | SITE TYPE                 | STATUS     | PCBs      |          | OTHER ORGANICS |          | METALS                 |          | OTHER      |          | SITE COMMENTS                             |
|   |                           |            | GW        | COMMENTS | GW             | COMMENTS | GW                     | COMMENTS | GW         | COMMENTS |   |
| MEDIUM TOWN WATER TREATMENT FACILITY                | Underground Storage Tanks | ACTIVE     | N         |          | N              |          | N                      |          | N          |          | GWID: 0 FacDesc: Local Government Ret.    |
| JGRC INC  | Underground Storage Tanks | INACT      | N         |          | N              |          | N                      |          | N          |          | GWID: 1 FacDesc: Commercial Ret. GASOLINE |
| DOMESTIC SEPTIC                                     | Residential               | 0.1 / Acre | N         |          | N              |          | N                      |          | M          |          | 5 Residences                              |

**Medium Town Example - Land Use Land Cover**



**Medium Town Example - Land Use Land Cover**

| MEDIUM TOWN (Wells # 2A & 3A) LAND USE CONTAMINANT POTENTIAL |              |            |           |           |                        |            |                               |
|--|--------------|------------|-----------|-----------|------------------------|------------|-------------------------------|
| LAND USE DATA  |              |            | NUTRIENTS | PATHOGENS | PETROLEUM HYDROCARBONS | PESTICIDES | SITE COMMENTS                 |
| LULC   | AREA (acres) | Percent    |           |           |                        |            |                               |
| CROPLAND   | 19.8         | 39.2       | M         | N         | N                      | M          | *20% - 50% of Wellhead Area   |
| RESIDENTIAL  | 15.9         | 31.6       | L*        | L*        | N                      | N          | *See Discrete Sources         |
| COMMERCIAL   | 8.2          | 16.2       | L         | N         | L*                     | L          | *See Discrete Sources         |
| INDUSTRIAL   | 6.3          | 12.5       | N         | N         | H**                    | N          | **Probable 'Non-Haz Industry' |
| FOREST   | 0.2          | 0.3        | N         | N         | N                      | N          |                               |
| WETLANDS   | 0.1          | 0.2        | N         | N         | N                      | N          |                               |
| <b>Total Area</b>  | <b>50</b>    | <b>100</b> |           |           |                        |            |                               |

| LAND USE DATA     |              |            | PCBs | OTHER ORGANICS | METALS | OTHER INORGANICS | SITE COMMENTS                 |
|-------------------|--------------|------------|------|----------------|--------|------------------|-------------------------------|
| LULC              | AREA (acres) | Percent    |      |                |        |                  |                               |
| CROPLAND          | 19.8         | 39.2       | N    | N              | N      | L                |                               |
| RESIDENTIAL       | 15.9         | 31.6       | N    | L              | N      | N                |                               |
| COMMERCIAL        | 8.2          | 16.2       | N    | M*             | L      | L                | *See Discrete Sources         |
| INDUSTRIAL        | 6.3          | 12.5       | L    | H**            | M**    | M**              | **Probable 'Non-Haz Industry' |
| FOREST            | 0.2          | 0.3        | N    | N              | N      | N                |                               |
| WETLANDS          | 0.1          | 0.2        | N    | N              | N      | N                |                               |
| <b>Total Area</b> | <b>50</b>    | <b>100</b> |      |                |        |                  |                               |

## Source Water Susceptibility Determination Matrix

|                              |               |   |   |   |  |  |      |
|------------------------------|---------------|---|---|---|--|--|------|
| <b>VULNERABILITY RATING</b>  | <b>HIGH</b>   | Surface Water Intakes<br>GWUDI Well<br>Poor Integrity Well<br>Cockeysville Well<br>Shallow Unconfined Well                    | LOW   | MEDIUM  | HIGH   | HIGH   | HIGH |
|                              | <b>MEDIUM</b> | Fractured Bedrock Well<br>Semi-Confined Well<br>Deep Unconfined Well  | LOW   | LOW   | MEDIUM   | HIGH   | HIGH |
|                              | <b>LOW</b>    | Confined Well   | LOW   | LOW   | LOW  | MEDIUM   | HIGH |
|                              |               | <b>NEGLIGIBLE</b>   | LOW   | MEDIUM  | HIGH   | EXISTING   |      |
|                              |               | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in the event of a release. | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases | Substance could be present at levels of concern. No or insufficient monitoring. | Substance discharged under permit (Monitoring generally required) or substance present onsite at levels of concern (Unpermitted discharge) or substance present onsite at levels of concern (Unpermitted discharge). | Substance detected in source (rw) water at levels greater than 50% of the MCL. Active treatment may be in place. |      |
| <b>CONTAMINANT POTENTIAL</b> |               |   |   |   |  |  |      |

### Medium Town Example - Nutrient Susceptibility Determination

```

graph TD
    A{Is it Surface Water/GWUDI or Ground Water?} --> B{What is the Well integrity?}
    B --> C{Is the Well in Piedmont or Coastal Plain?}
    C --> D{Is the Well Unconfined?}
    D -- Yes --> E{Is the Well Screen <100' deep?}
    E -- No (Deep) --> F[MEDIUM]
    
```

| MEDIUM TOWN (Wells # 2A & 3A) CONTAMINANT POTENTIAL |                           |            |           |          |   |               |
|---|---------------------------|------------|-----------|----------|---|---------------|
| DISCRETE SOURCES                                    |                           |            |           |          |   |               |
| SITE NAME   | SITE TYPE                 | STATUS     | NUTRIENTS |          | SITE COMMENTS                             |               |
|   |                           |            | GW        | COMMENTS |   |               |
| MEDIUM TOWN WATER TREATMENT FACILITY                | Underground Storage Tanks | INACTIVE   | N         |          | GWID: 0 FacDesc: Local Government Rel:    |               |
| JGRC INC  | Underground Storage Tanks | INACTIVE   | N         |          | GWID: 1 FacDesc: Commercial Rel: GASOLINE |               |
| DOMESTIC SEPTIC                                     | Residential               |            | L*        |          | 5 Residences                              |               |
| LAND USE DATA                                       |                           |            |           |          |   |               |
| LULC  | AREA (acres)              | Percent    |           |          |   |               |
| CROPLAND  | 19.8                      | 39.2       | M*        |          | * 20% - 50% of Wellhead Area              |               |
| RESIDENTIAL   | 15.9                      | 31.6       | L*        |          | *See Discrete Sources                     |               |
| COMMERCIAL  | 8.2                       | 16.2       | L         |          |   |               |
| INDUSTRIAL  | 6.3                       | 12.5       | N         |          |   |               |
| FOREST  | 0.2                       | 0.3        | N         |          |   |               |
| WETLANDS  | 0.1                       | 0.2        | N         |          |   |               |
| <b>Total Area</b>                                   | <b>50</b>                 | <b>100</b> |           |          |   |               |
| SUMMARY   |                           |            |           |          |   |               |
|   |                           |            |           |          |   | <b>MEDIUM</b> |

|                              |               |   |   |   |  |  |
|------------------------------|---------------|---|---|---|--|--|
| <b>VULNERABILITY RATING</b>  | <b>HIGH</b>   | Surface Water Intakes<br>GWUDI Well<br>Poor Integrity Well<br>Cockeysville Well<br>Shallow Unconfined Well                    | LOW   | MEDIUM  | HIGH   | HIGH   |
|                              | <b>MEDIUM</b> | Fractured Bedrock Well<br>Semi-Confined Well<br>Deep Unconfined Well  | LOW   | LOW   | <b>MEDIUM</b>  | HIGH   |
|                              | <b>LOW</b>    | Confined Well   | LOW   | LOW   | LOW  | MEDIUM   |
|                              |               | <b>NEGLIGIBLE</b>   | LOW   | MEDIUM  | HIGH   | EXISTING   |
|                              |               | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in the event of a release. | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases | Substance could be present at levels of concern. No or insufficient monitoring. | Substance discharged under permit (Monitoring generally required) or substance present onsite at levels of concern (Unpermitted discharge) or substance present onsite at levels of concern (Unpermitted discharge). | Substance detected in source (rw) water at levels greater than 50% of the MCL. Active treatment may be in place. |
| <b>CONTAMINANT POTENTIAL</b> |               |   |   |   |  |  |

# Map of Christina Basin

## Christina Basin Water Quality Management Strategy *Base Map*



### Source Water Susceptibility Assessment (Example Cont'd)

**I. CONTAMINANT CATEGORY**

*List contaminants of concern where monitoring indicates detection above 50% of the MCL.*

| 10. <u>Contaminant</u>                   | 11. <u>MCL</u> | 12. <u>Concentration</u> | 13. <u>Date</u> |
|--|----------------|--------------------------|-----------------|
| <u>Nutrients</u>                         |                |                          |                 |
| Nitrate-Nitrogen                         | 10 mg/l        | 4.5 mg/l                 |                 |
| <u>Bacteria</u>                          |                |                          |                 |
| Fecal Coliform                           | 0              | 10,000/100 ml            |                 |
| <u>Petroleum Hydrocarbons</u>            |                |                          |                 |
| <u>Organics</u>                          |                |                          |                 |
| <u>Pesticides</u>                        |                |                          |                 |
| <u>PCBs</u>                              |                |                          |                 |
| <u>Sediments/Turbidity</u>               |                |                          |                 |
| Turbidity                                | See Regs       | 254                      |                 |
| <u>Disinfection Byproduct Precursors</u> |                |                          |                 |
| <u>Metals</u>                            |                |                          |                 |
| <u>Inorganic</u>                         |                |                          |                 |

## Source Water Susceptibility Assessment (Example Cont'd)

|   |                                   |
|---|-----------------------------------|
| <b>III. HYDROGEOLOGIC PARAMETERS</b>                    |                                   |
| <i>If surface water system, answer questions 14-16.</i> |                                   |
| <i>If groundwater system, answer questions 17-20.</i>   |                                   |
| 14. Watershed Type:                                     | <u>White Clay Creek Watershed</u> |
| 15. Capacity (mgd):                                     | <u>3</u>                          |
| 16. Population Served:                                  | <u>36,000</u>                     |
| 17. Aquifer Type:                                       | _____                             |
| 18. Capacity (mgd):                                     | _____                             |
| 19. Population Served:                                  | _____                             |
| 20. Depth of Well (ft.):                                | _____                             |

## Source Water Susceptibility Assessment (Example Cont'd)

|   |  |
|---|--|
| <b>IV. DISCRETE SOURCES</b>   |  |
| <i>List the sites within the Wellhead, Cockeysville, or Watershed area and note within which area the source resides.</i> |  |
| 21. Circle one:   | Wellhead Area      Cockeysville Area <u>Watershed Area</u> |
| 22. Animal Operations   |  |
| 23. Combined Sewer Overflow   |  |
| 24. Dredge Spoil  |  |
| 25. Hazardous Waste Generators  |  |
| <b>DE-052</b>   | <b>Newark Housing Authority Landfill</b>                   |
| <b>DE-1049</b>  | <b>DuPont Louviers – MBNA</b>                              |
| <b>DE-214</b>   | <b>Gore W.L. Association Inc. – Newark</b>                 |
| <b>DE-1050</b>  | <b>DuPont Louviers - Gore</b>                              |
| 26. Landfills & Dumps   |  |
|   | <b>New Garden Township (I)</b>                             |
|   | <b>London Grove – West Grove (I)</b>                       |
|   | <b>SECCRA Landfill (A)</b>                                 |
| 27. Large Septic  |  |

## Source Water Susceptibility Assessment (Example Cont'd)

### IV. Discrete Sources (Cont'd)

|   |   |
|---|---|
| 28. NPDES Outfalls                      |   |
| <b>PA52451</b>                          | <b>Francis L. Hamilton Oates STP</b>          |
| <b>PA40436</b>                          | <b>Chadds Ford Investment Co./ Red Fox GC</b> |
| <b>PA29343</b>                          | <b>Chatham Acres</b>                          |
| <b>PA54356</b>                          | <b>Getty Petroleum Corporation</b>            |
| <b>PA52019</b>                          | <b>Avon Grove Trailer Court</b>               |
| <b>PA25488</b>                          | <b>Avondale Borough Sewer Authority</b>       |
| <b>PA24066</b>                          | <b>West Grove Borough Authority STP</b>       |
| <b>PA53783</b>                          | <b>Avon Grove School District</b>             |
| 29. Pesticide Loading, Mixing & Storage |   |
| 30. Salvage Yards                       |   |
| 31. Small Septic                        |   |
| 32. SIRB                                |   |
| 33. Sludge Application                  |   |
| 34. Spray Irrigation                    |   |
| 35. Tire Piles                          |   |
| 36. TRI                                 |   |

## Source Water Susceptibility Assessment (Example Cont'd)

### IV. Discrete Sources (Cont'd)

|                               |   |
|-------------------------------|---|
| 37. Underground Storage Tanks |   |
| <b>3000-515</b>               | <b>Louviers Country Club</b>                      |
| <b>3000-515</b>               | <b>Louviers Maintenance Yard</b>                  |
| <b>3000-515</b>               | <b>Louviers CC Equipment Center</b>               |
| <b>3000-515</b>               | <b>MBNA Milford Crossroads Clubhouse</b>          |
| <b>3081-719</b>               | <b>Wm. Taylor Residence</b>                       |
| 38. Land Use (sq. mi. / %)    |   |
| Agriculture                   | <b><u>34.34</u></b> sq. mi. / <b><u>49</u></b> %  |
| Residential                   | <b><u>10.35</u></b> sq. mi. / <b><u>15</u></b> %  |
| Office/Industrial/Commercial  | <b><u>1.76</u></b> sq. mi. / <b><u>3</u></b> %    |
| Open Space Wooded             | <b><u>22.80</u></b> sq. mi. / <b><u>33</u></b> %  |
| <b>TOTAL</b>                  | <b><u>69.25</u></b> sq. mi. / <b><u>100</u></b> % |

## Source Water Susceptibility Assessment (Example Cont'd)

V. WELL INTEGRITY

29. Date well was installed: \_\_\_\_\_

30. Was well installed before Delaware Well Drilling Regulations were passed in 19??  
 (Circle one):        Yes        No

VI. SUSCEPTIBILITY TO CONTAMINATION

*Determination should be made based on Tables 5-1, 5-2, or 5-3.*

31. High or Low:   **High**  

# Individual Source Rating City of Newark Surface Water Intake - White Clay Creek

| Contaminant Category              | Discrete Sources                      |                         |   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
|-----------------------------------|---------------------------------------|-------------------------|---|----------------------------|-------------------|--------------|----------------|-------------------------------------|---------------|--------------|-----|--------------------|------------------|------------|-----|-----|
|                                   | Animal Operations                     | Combined Sewer Overflow | Dredge Spoil  | Hazardous Waste Generators | Landfills & Dumps | Large Septic | NPDES Outfalls | Pesticide Loading, Mixing & Storage | Salvage Yards | Small Septic | SRB | Sludge Application | Spray Irrigation | Tire Piles | TRI | UST |
| Nutrients                         | E                                     | N                       | N   | L                          | L                 | H            | E              | N                                   | N             | H            | N   | N                  | N                | N          | N   | N   |
| Bacteria                          | E                                     | N                       | N   | L                          | L                 | H            | E              | N                                   | N             | H            | N   | N                  | N                | N          | N   | N   |
| Petroleum Hydrocarbons            | N                                     | N                       | N   | L                          | L                 | N            | L              | N                                   | N             | N            | N   | N                  | N                | N          | N   | L   |
| Organics                          | N                                     | N                       | N   | L                          | L                 | N            | L              | N                                   | N             | N            | N   | N                  | N                | N          | N   | L   |
| Pesticides                        | L                                     | N                       | N   | L                          | L                 | N            | L              | L                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| PCBs                              | N                                     | N                       | N   | N                          | N                 | N            | N              | N                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| Sediments/Turbidity               | E                                     | N                       | N   | L                          | L                 | N            | E              | N                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| Disinfection Byproduct Precursors | N                                     | N                       | N   | L                          | L                 | N            | L              | N                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| Metals                            | N                                     | N                       | N   | L                          | L                 | N            | L              | N                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| Inorganic                         | N                                     | N                       | N   | L                          | L                 | N            | L              | N                                   | N             | N            | N   | N                  | N                | N          | N   | N   |
| N = Negligible                    | 0 Not Applicable                      |                         | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in this media in the event of a release. |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| L = Low                           | 1 Present - No or Minimal Releases    |                         | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases to this media at levels of concern. |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| M = Medium                        | 2 Potentially Present - No Monitoring |                         | Substance could be present at levels of concern. No or insufficient monitoring of this media.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| M = Medium                        | 3 Present - No Monitoring             |                         | Substance present in significant quantities onsite. No monitoring of this media.  |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| H = High                          | 4 Permitted Discharge                 |                         | Substance discharged under permit. Monitoring generally required.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| H = High                          | 5 Onsite Contamination                |                         | Substance present onsite at levels of concern in this media. Unpermitted discharge.   |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |
| E = Existing                      | 6 Offsite Contamination               |                         | Substance present offsite at levels of concern in this media. Unpermitted discharge.  |                            |                   |              |                |                                     |               |              |     |                    |                  |            |     |     |

# Non-Point Rating

| Contaminant Category              | Discrete Sources   |            |            |           |           |           |           |              |        |           |       |       |
|-----------------------------------|--|------------|------------|-----------|-----------|-----------|-----------|--------------|--------|-----------|-------|-------|
|                                   | Residential  | Commercial | Industrial | Croplands | Deciduous | Evergreen | Waterways | Impoundments | Barren | Rangeland | Other | Other |
| Nutrients                         |  |            |            |           |           |           |           |              |        |           |       |       |
| Bacteria                          |  |            |            |           |           |           |           |              |        |           |       |       |
| Petroleum Hydrocarbons            |  |            |            |           |           |           |           |              |        |           |       |       |
| Organics                          |  |            |            |           |           |           |           |              |        |           |       |       |
| Pesticides                        |  |            |            |           |           |           |           |              |        |           |       |       |
| PCBs                              |  |            |            |           |           |           |           |              |        |           |       |       |
| Sediments/Turbidity               |  |            |            |           |           |           |           |              |        |           |       |       |
| Disinfection Byproduct Precursors |  |            |            |           |           |           |           |              |        |           |       |       |
| Metals                            |  |            |            |           |           |           |           |              |        |           |       |       |
| Inorganic                         |  |            |            |           |           |           |           |              |        |           |       |       |
| Negligible                        | Substance not present in sufficient quantities onsite to cause contamination at a level of concern |            |            |           |           |           |           |              |        |           |       |       |

## Source Water Susceptibility Determination Matrix

| VULNERABILITY RATING         | HIGH                   | Surface Water Intakes   | LOW   | MEDIUM  | HIGH  | HIGH   | HIGH |
|------------------------------|------------------------|---|---|---|---|--|------|
|                              |                        | GWUDI Well  |   |   |   |  |      |
|                              |                        | Poor Integrity Well   |   |   |   |  |      |
|                              |                        | Cockeysville Well   |   |   |   |  |      |
| Shallow Unconfined Well      |                        |   |   |   |   |  |      |
| MEDIUM                       | Fractured Bedrock Well | LOW   | LOW   | MEDIUM  | HIGH  | HIGH   |      |
|                              | Semi-Confined Well     |   |   |   |   |  |      |
|                              | Deep Unconfined Well   |   |   |   |   |  |      |
| LOW                          | Confined Well          | LOW   | LOW   | LOW   | MEDIUM  | HIGH   |      |
|                              |                        | NEGLIGIBLE  | LOW   | MEDIUM  | HIGH  | EXISTING   |      |
|                              |                        | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in the event of a release. | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases | Substance could be present at levels of concern. No or insufficient monitoring. | Substance discharged under permit (Monitoring generally required) or, substance present onsite at levels of concern (Unpermitted discharge) or, substance present offsite at levels of concern (Unpermitted discharge). | Substance detected in source (raw) water at levels greater than 50% of the MCL. Active treatment may be in place |      |
| <b>CONTAMINANT POTENTIAL</b> |                        |   |   |   |   |  |      |

# CITY OF NEWARK

## Surface Water Intake Along White Clay Creek

| CATEGORY                          | SUSCEPTIBILITY |
|-----------------------------------|----------------|
| Nutrients                         | High           |
| Bacteria                          | High           |
| Petroleum Hydrocarbons            | Medium         |
| Organics                          | Medium         |
| Pesticides                        | Medium         |
| PCBs                              | Low            |
| Sediments/Turbidity               | High           |
| Disinfection Byproduct Precursors | Medium         |
| Metals                            | Medium         |
| Inorganics                        | Medium         |

## MEETING SUMMARY

### DELAWARE SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM (SWAPP) CITIZEN AND TECHNICAL ADVISORY COMMITTEE

Delaware Department of Public Safety  
Conference Room  
1999  
Dover, Delaware  
11:30am

Wednesday  
January 13,  
8:30 –

#### ***I. ADMINISTRATIVE***

John Barndt, DNREC, served as moderator for the meeting. Summaries for both the December 16, 1998 and January 6, 1999 meetings were distributed. Due to time constraints, it was decided that each committee member would review the summaries after the meeting and provide comments to Mr. Barndt or to Lesley McKnight, WRA, by Friday, January 15, 1999. If no comments were received, the minutes would be approved as submitted. (Editor's note: No comments received, so the minutes were approved as submitted.)

Mr. Barndt also reminded the committee about the two public workshops: January 19, 1999 at Milford High School from 5 – 8pm and January 20, 1999 at Bear Public Library from 4:30 – 7 pm. Press releases were sent to all weekly and daily papers in the state on January 12, and advertisements will be placed in the newspapers just prior to the workshops. Melinda Carlisle, DNREC will handle all calls from newspapers. *Joe Demul, AARP, asked that the committee be given handouts of the advertisement so that they might publicize the meeting. Copies were made and distributed at the meeting.*

Mr. Barndt asked for members of the committee to volunteer to talk at each workshop. Anthony Gersitz, City of Dover, agreed to speak in Milford and Sheila Dolan, United Water Delaware agreed to talk in Bear. *Mr. Gersitz suggested that a list of everyone who has attended any CTAC meeting be displayed at the workshops. The committee was then asked who would be attending each workshop. Approximately 1/2 of the committee will attend the Milford workshop and about 3/4 will come to the Bear workshop.*

#### **II. CHAPTER 5: SUSCEPTIBILITY ANALYSIS**

Steve Smailer, DNREC, began this section by reviewing the previously proposed Susceptibility Determination Matrix. *Then, Joe DiNunzio, Artesian Water Company, offered an alternative Susceptibility Matrix. (His alternative is attached.) Mr. DiNunzio explained that he had met with Jeff Bross, Committee of 100, Joe Dombrowski, City of Newark, and others to design an alternative to the "High, Medium, or Low" (HML) system that was being proposed. (His proposal is attached.) The proposal contained vulnerability ratings and contamination potential similar to that proposed by DNREC,*

*and added a column to differentiate between sources of contaminants that test between 50% MCL and 100% MCL exceedance. He also proposed that numbers be used instead of the HML system with each number received a word designation from “Low” to “Significant.” He also stated that he felt since naturally-occurring chemicals can not be reduced in the source water they should not be included in the analysis.*

*Anita Beckel, Office of Drinking Water, was still concerned about man-made chemicals that are above detection limits but below 50% MCL levels. She did like the words that Mr. DiNunzio proposed. Mr. Smailer suggested that a category could be included to note when man-made chemicals are between detection limits and 50% MCL and when naturally-occurring chemicals are above 50% MCL. Jerry Kauffman, WRA, noted that Table 4.1 had been changed to reflect her comments. (The revised table is attached.) Mr. Barndt and Mr. Smailer proposed an alternative to Ms. Beckel’s concern by adding 2 more categories of contamination potential: detection and exceedance. Sheila Dolan, United Water Delaware, stated that exceedance of 100% MCL is not necessarily a source water violation. Mr. Demul reminded that this is source water before treatment.*

*Steve Williams, DNREC, did not agree with the terms that Mr. DiNunzio proposed, as did Lorraine Fleming, Christina Conservancy, and Marion Stewart, Civic League of New Castle County and Ashley Toy, EPA. Frank Desrosier, AARP, liked the grading of terms and the differentiation proposed, but both he and Ms. Toy were concerned that the number system expressed an accuracy of stratum that did not exist. Gilbert Holt, City of Lewes, asked if the public would see the results, and was concerned about land use decisions based on arbitrary numbers rather than HML. Ms. Dolan asked if letters could be used rather than numbers.*

*Several committee members, including Mr. Desrosier, Mr. Kauffman and Ms. Fleming stated that they liked the number ranking used in addition to the verbiage. Mr. Smailer agreed that the numbers showed a trend from low to high. Mr. DiNunzio stated that he was trying to avoid using the term “High”.*

*Mr. Barndt asked how this would work with the Consumer Confidence Report. Ms. Beckel stated that water companies might use the information in their report to show the outcome of treatment being done to water sources.*

*Mr. Smailer then presented an alternative that was a compromise between the original Susceptibility Determination Matrix and the matrix proposed by Mr. DiNunzio. (This alternative is attached)*

*John Talley, DGS, made a motion that the committee accept a susceptibility methodology using “1=least” and “7=most” with no word gradations in between 1 and 7. Ms Fleming seconded the motion. The vote was 14 for and 5 opposed. Ms. Toy was concerned that most who were opposed were the ones writing the SWAP and asked why these people were opposed. Those who were opposed: Ms. Toy, Mr. Williams, Ms. Beckel, Mr. Barndt and Mr. Smailer. Mr. Kauffman was also concerned about the 5 opposed votes and asked that the committee allow these members to voice their concerns.*

*These 5 agreed that they were opposed to the motion because it did not include a “moderate” term. Ms. Fleming motioned to amend the first motion to include the word “moderately”. Joe DiNunzio seconded and the motion was passed by all.*

### III. DRAFT SWAP DOCUMENT

Mr. Barndt thanked those on the committee who had filled out Tables 5.2 and 5.3. Mr. Smailer commented that he liked how Mr. DiNunzio had shaded in the areas he wished counted as possible and this format will be used in the final plan. A composite table will be made based on these recommendations. Ms. Beckel asked how golf courses would be handled under the land use category. Mr. Smailer and Mr. Barndt noted that Scott Blaier, Delaware Department of Agriculture, and Tad Yancheski, Committee of 100, had recommended that golf courses be counted as a discrete source.

*Mr. Talley asked what is the definition of a “substance”? Mr. Smailer explained that the term “substance” is compound-specific. Mr. Talley also asked what is the definition of “onsite?” Mr. Smailer answered that the site refers to the property boundary and contaminant potential onsite refers to anything within the property boundaries. Mr. Talley also asked to have “contaminants of concern” explained. Mr. Barndt noted that this is a programmatic term.*

Martin Wollaston, WRA, presented *Chapter 6: SWAP Implementation* to the committee. He explained that source water assessments would be conducted in the following order: (1) Community Public Water Systems, (2) Non-transient Non-community Public Water Systems, (3) Transient Non-community Public Water Systems. Priority will be given for the following in no particular order: Population served, vulnerability of source, and direct request of water suppliers. Information is still being gathered and this may effect the priority somewhat.

Chapter 6 will also include information for domestic well owners. The information gathered in the contaminant source inventory is available to everyone if requested and can be applied to domestic wells, as can the methodology for determining susceptibility. The chapter also explains how the Division of Public Health offers well-testing and additional information.

Mr. Demul asked that information on domestic wells be brought to the workshops. Ms. Beckel agreed to bring pamphlets.

### IV. MISCELLANEOUS

Mr. Barndt asked the committee if they wanted to meet on February 3, 1999. The committee decided this was not necessary, but that it would like to meet when EPA sends its comments on the SWAP to Delaware's DNREC.

Ms. Fleming asked about the Public Summary. Mr. Barndt noted that this is currently being drafted by Mr. Wollaston and Doyle Brown, DNREC.

Mr. Gersitz thanked DNREC and WRA for their effort and applauded the CTAC for their hard work.

## V. ATTENDEES TO THIS CTAC MEETING

### Committee members in attendance:

|   |  |
|---|--|
| American Association of Retired Persons (AARP)                                | Frank Desrosier                              |
|   | Joseph Demul                                 |
| Artesian Water Company  | Joseph DiNunzio                              |
| City of Dover   | Anthony Gersitz                              |
| Civic League of New Castle County   | Marion Stewart                               |
| Christina Conservancy   | Lorraine Fleming                             |
| Committee of 100/Duffield Associates  | Tim Ruga                                     |
| Council of Farm Organizations   | Lowder Mitchell (representing Jane Mitchell) |
| Culligan Water Conditioning   | Kent Bacon                                   |
| Delaware Department of Natural Resources<br>and Environmental Control (DNREC) | John Barndt (Water Supply Section)           |
|   | Hassan Mirsajadi (Watershed Assessment)      |
|   | Steve Smailer (Water Supply Section)         |
|   | Steve Williams (Whole Basin Management)      |
| Delaware Geological Survey  | John Talley                                  |
| Delaware Nature Society   | Chris Brown                                  |
| Delaware Rural Water Association  | Jigar Patel                                  |
| Office of Drinking Water  | Anita Beckel                                 |
| Town of Lewes, Board of Public Works  | Gilbert Holt                                 |
| US Environmental Protection Agency (EPA)<br>Region III                        | Ashley Toy                                   |
| United Water Delaware   | Sheila Dolan                                 |
| Water Resources Agency  | Jerry Kauffman                               |
|   | Martin Wollaston                             |

### Others in attendance:

|  |                 |
|--|-----------------|
| AARP                                     | Lloyd D. Hughes |
| Artesian Water Company                   | Bruce Kraeuter  |
|  | Nancy Parker    |
| City of Newark                           | Joe Dombrowski  |
| Delaware Department of Natural Resources | Stewart Lovell  |
| Office of Drinking Water                 | Kirsten Higgins |
| Water Resources Agency                   | Lesley McKnight |

**VI. ATTACHMENTS**

**MODIFIED Source Water Susceptibility Determination Matrix 1**

|  |          | <b>SUSCEPTIBILITY DETERMINATION</b>   |  |   |  |  |  |
|--|----------|---|--|---|--|--|--|
|  |          | <b>CONTAMINANT POTENTIAL</b>  |  |   |  |  |  |
|  |          | Substance not present in sufficient quantities onsite to cause contamination at a level of concern in the event of a release. | Substance present in significant quantities onsite but monitoring data indicates no or minimal releases. | Substance could be present at levels of concern, but insufficient monitoring. | Substance discharged under permit (Monitoring generally required) or substance present onsite at levels of concern (Unpermitted discharge) or substance present onsite at levels of concern (Unpermitted discharge). | Substance detected in source (raw) water at levels greater than 50% of the MCL, but less than 100% of the MCL. Active treatment may be in place. | Substance detected in source (raw) water at levels greater than 100% of the MCL. Active treatment may be in place. |
|  |          | <b>VULNERABILITY RATING</b>   | Confined Well  | <b>1</b>  | <b>2</b>   | <b>3</b>   | <b>4</b>   |
| Fractured Bedrock Well<br>Semi-Confined Well<br>Deep Unconfined Well | <b>2</b> |   | <b>3</b>   | <b>4</b>  | <b>5</b>   | <b>6</b>   | <b>7</b>   |
| Surface Water Intakes<br>CAULDI Well                                 | <b>3</b> |   | <b>4</b>   | <b>5</b>  | <b>6</b>   | <b>7</b>   | <b>7</b>   |
| Poor Integrity Well<br>Cockeysville Well                             | <b>3</b> |   | <b>4</b>   | <b>5</b>  | <b>6</b>   | <b>7</b>   | <b>7</b>   |
| Shallow Unconfined Well  | <b>3</b> |   | <b>4</b>   | <b>5</b>  | <b>6</b>   | <b>7</b>   | <b>7</b>   |

- 1 - Negligible
- 2 - Lowest
- 3 - Low
- 4 - Moderate
- 5 - Moderately Significant
- 6 - Significant
- 7 - Known

## MODIFIED Source Water Susceptibility Determination Matrix 2

### SUSCEPTIBILITY DETERMINATION

| VULNERABILITY RATING | SUSCEPTIBILITY DETERMINATION  |   |   |  | OBSERVED DATA  |  |  |
|----------------------|---|---|---|--|--|--|--|
|                      | WELL TYPE   | LOW   | MEDIUM  | HIGH   | HIGH   | ACTUAL EXCEEDANCE  |  |
| <b>HIGH</b>          | Surface Water Intake<br>Unconfined Well<br>Poor Integrity Well<br>Ephemeral Well<br>Shallow Unconfined Well | LOW   | MEDIUM  | HIGH   | HIGH   | ACTUAL EXCEEDANCE  |  |
| <b>MEDIUM</b>        | Fractured Bedrock Well<br>Semi-Confined Well<br>Deep Unconfined Well  | LOW   | LOW   | MEDIUM   | HIGH   | ACTUAL EXCEEDANCE  |  |
| <b>LOW</b>           | Confined Well   | LOW   | LOW   | LOW  | MEDIUM   | ACTUAL EXCEEDANCE  |  |
|                      |   | <b>NEGLECTIBLE</b>  | <b>LOW</b>  | <b>MEDIUM</b>  | <b>HIGH</b>  | <b>DETECTION</b>   | <b>EXCEEDANCE</b>  |
|                      |   | Substance not present in sufficient quantities or does not cause contamination at a level of concern in the event of a release. | Substance present in significant quantities with monitoring data indicating no or minimal releases. | Substance could be present at levels of concern. Near sufficient monitoring. | Substance discharged under permit. Monitoring generally required or substance present at levels of concern. (Reported to regulator). Substance present at levels of concern. (Reported discharge). | Substance detected in source (as a result of a well protection 50% of the MCL, but less than 100% of the MCL). Further substance found above Dismal Level but below the MCL. Active treatment may be in place. | Substance detected in source (as a result of a well protection 100% of the MCL. Active treatment may be in place). |
|                      |   | <b>CONTAMINANT POTENTIAL</b>  |   |  |  | <b>OBSERVED DATA</b>   |  |