

APPENDIX C

TECHNICAL AND CITIZENS ADVISORY COMMITTEE

AGENDAS AND MEETING SUMMARIES

North Carolina Source Water Assessment Advisory Committee

Meeting Agenda

September 3, 1998

- 9:00 - 9:15 Welcome and Introductions - Jessica Miles,
Chief, Public Water Supply Section
- 9:15 - 9:30 Keynote - Linda Sewall
Director, Division of Environmental Health
- 9:30 - 9:45 Source Water Assessment and Protection Program,
Background and Summary - Bob Midgette, Supervisor,
Protection and Enforcement Branch
- 9:45 - 10:00 Overview of Public Water Supplies in North Carolina, Bob Midgette
- 10:00 - 10:15 SWAP Plan Requirements, Elizabeth Morey, Hydrogeologist
- 10:15 - 10:30 Wellhead Protection, Gale Johnson, Hydrogeologist
- 10:30 - 10:45 Break
- 10:45 - 11:00 North Carolina's Water Supply Watershed Protection Program,
Steve Zoufaly, Supervisor, Water Quality Section
- 11:00 - 11:15 Public Participation, Jessica Miles
- 11:15 - 11:45 SWAP Program Benefits and Uses, Jessica Miles
Facilitated Discussion, Norma Murphy, Craig Deal
- 11:45 - 12:00 Sign-up for Ground Water and Surface Water Work Groups,
Questions, homework Assignment, Bob Midgette
- 12:00 - 1:30 Lunch (on your own)
- 1:30 - 4:30
Break Included
- | | | |
|-----------|--|-------------|
| Session 1 | Ground Water Assessment Approach
Delineation, Contaminant Inventory, Susceptibility
Determination | FACILITATOR |
| Session 2 | Surface Water Assessment Approach
Delineation, Contaminant Inventory, Susceptibility
Determination | FACILITATOR |
- 4:30 Adjourn

Summary of First Technical and Citizens Advisory Committee Meeting for North Carolina's Source Water Assessment Program Plan Development

Introduction

The first of three planned North Carolina Source Water Assessment Program (SWAP) Technical and Citizens Advisory Committee meetings was held in Raleigh, NC in the Ground Floor Hearing Room of the Archdale Building on September 3, 1998. An agenda of the meeting is attached. The morning session consisted of a series of short presentations by Department of Environment and Natural Resources staff to introduce the SWAP plan development process and define the role of the Advisory committee in its development and implementation. The afternoon break-out groups were designated for discussions of ground water and surface water source water assessment delineation methodologies. Some discussion of contaminant inventory strategies was also held in both groups. A summary of the discussions and presentations is included in this report.

Brief Summary of Presentations from the Morning Session

Jessica Miles, Chief, Public Water Supply Section, Jimmy Carter, Deputy Assistant Secretary of Environmental Protection Department of Environment and Natural Resources, and Linda Sewall, Director, Division of Environmental Health, gave introductory remarks emphasizing the value of the SWAP for focusing the state's program efforts on prevention of pollution of public water supplies. Additionally, they stressed the importance that the SWAP places on public involvement and stakeholder representation in program development and implementation.

Bob Midgette, Supervisor, Protection and Enforcement Branch, Public Water Supply Section, presented a background and overview of the SWAP highlighting 1) the goal of preventing pollutants from entering drinking water supplies, 2) the intent to integrate North Carolina's existing drinking water supply protection programs into the SWAP, and 3) the opportunity to use the SWAP as a means through which contaminant source information from existing environmental programs can be focused specifically to protect drinking water supplies. Also, a brief summary of the public water supply systems in North Carolina and how the state categorizes them was provided. Elizabeth Morey, Hydrogeologist, Public Water Supply Section, presented a brief overview of the requirements of an EPA approvable SWAP plan. Gale Johnson, Hydrogeologist, Public Water Supply Section, gave a summary of the Wellhead Protection Program in North Carolina, its relation to the SWAP and its role in protecting drinking water supplies that rely on ground water sources. Steve Zoufaly, Supervisor, Water Quality Section, presented a review of the North Carolina Water Supply Watershed Protection Program water supply classification scheme and the required local government ordinances for the protection of drinking water supplies that rely on surface water.

Jessica Miles gave an overview of the required elements of public participation in the SWAP development and the state's plan of convening joint citizens and technical advisory committee meetings with breakout groups for discussions of surface water and ground water SWAP strategies. The role and responsibilities of the advisory committee was defined as providing feedback on proposed strategies as well as offering advice and making recommendations. Additionally, the importance of making the assessments available to the public in an easily understandable form was presented. The critical need for making the SWAP beneficial and useful to public water systems was emphasized. This led into a discussion led by trained DENR facilitators with all attendees. The participants were asked to share their ideas for potential benefits and uses of SWAPs. These are summarized at the end of this report.

Brief Summary of Ground Water Work Group Afternoon Session

The first meeting of the Ground Water Work Group was convened at 1:30 PM in the auditorium of the Highway Building at 11 S. Wilmington Street. The purpose of the meeting was to present the proposed methodology for delineating boundaries of assessment areas. These delineated assessment areas represent the area from which water supplying a public water supply well or well field is derived. The delineated area is also the area through which contaminants are reasonably likely to move towards and reach such water well or well fields. The state also elicited committee members' recommendations and advice regarding the technical feasibility and effectiveness of the proposed methodology.

Carl Bailey, Assistant Chief for Planning, Groundwater Section, opened the meeting with a presentation of the calculated fixed radius delineation method employed in the state's EPA approved Wellhead Protection (WHP) Program. The state's WHP Program was approved by EPA in 1995. This voluntary program provides guidance, training, and wellhead protection plan approval for public water supply systems. During this presentation it was proposed that the calculated fixed radius method be employed in the source water assessment program. Gale Johnson gave a presentation of other delineation methods acceptable under the WHP Program. This presentation included a discussion of the data availability, suitability and relative effort required by each method and the rationale supporting the use of the calculated fixed radius method.

Following the presentations, questions and comments were taken from the ground water work group. The work group was then asked if the proposed delineation method is sufficient for the source water assessment program. All were in agreement that the proposed method can serve as a minimum or baseline method with more sophisticated delineation methods acceptable under the state's WHP Program potentially applied to specific water systems where time and data availability allow. It was agreed that the state would review site specific data provided by local governments or other PWS system owners. If it is determined that the supplied data can support a more sophisticated delineation method acceptable under the state's WHP program, then

delineation may be conducted using this method. The work group also recommended that the shape of the calculated delineation area be modified, where appropriate, to take into account flow boundaries.

CONSENSUS FOR GROUND WATER DELINEATION METHODOLOGY:

The calculated fixed radius method in North Carolina's established Wellhead Protection Program will serve as the minimum or baseline delineation method for the SWAP plan. More sophisticated methods defined in the Wellhead Protection Program may be employed by the state, local governments or PWS systems in an effort to more accurately define the area contributing water to the well system. It was agreed that the state, within time constraints and budgeted resources, will review delineations provided by local governments or PWS systems that employ acceptable alternative delineation methods. Resulting alternative delineation areas will be incorporated into the SWAP if the state concludes that the use of the more sophisticated method was appropriate.

In addition during the ground water work group session the following questions and comments were recorded by Craig Deal, DENR facilitator.

Do we know what percent of wells we have or can get the data for in order to pursue more analytic delineation methods?

How well do different agencies with data share that data - availability and compatibility?

Where the data exists for individual systems, wells, aquifers, etc, can the public, especially utilities, gain access to it to make good decisions about locating new wells?

Calculated, Fixed radius & simplified variable shape methods don't capture flow boundaries- needs to be considered; need feed back from local water supply owner/operators on proposed area.

Need ultimately to consider well construction methods.

How does delineation, contaminant inventory and susceptibility determination all interact to ensure best protection strategy? May vary from site to site, or from one area of state to another.

Need to inform public of method limitations and assumptions.

How will we achieve QA/QC?

How will we consider effects from proximate recharge areas?

Summary of Surface Water Work Group Session

A review of the Water Supply Watershed Protection classification standards was presented. The 1989 N.C. Water Supply Watershed Protection Act established delineated watersheds identified as water supply watersheds that would be subject to

state rules. Local governments are required by the state to adopt minimum protective ordinances in these critical and protected areas.

The Water Supply Watershed Protection rules state that for WS-I, WS-II, WS-III and WS-IV watersheds the **critical area** is defined as either 2 mile from the normal pool elevation of the reservoir and draining to the intake or to the ridge line of the watershed (whichever comes first); or 2 mile upstream from and draining to the intake located directly in the stream or river or to the ridgeline of the watershed (whichever comes first). For WS-I, WS-II, and WS-III waters the **protected area** is defined as the entire drainage area or watershed for the river or stream. For WS-IV watersheds a protected area is defined as the area adjoining and upstream of the critical area in which protection measures are required. The boundary of the protected area is defined as within five miles of the normal pool elevation of the reservoir and draining to water supply reservoirs (measured from the normal pool elevation) or to the ridge line of the watershed (whichever comes first); or 10 miles upstream and draining to the intake located directly in the stream or river, or to the ridgeline of the watershed (whichever comes first). In a WS-IV watershed, three zones have thus been defined and GIS layers exist: the critical area, the protected area, and the entire watershed.

There was concern expressed that the delineated protected area of 10 miles upstream and draining to the intake for WS-IV waters wouldn't allow for consideration of potential contaminants outside the protected area. The discussion led to the conclusion that if this is determined to be a serious issue, the susceptibility determinations described in the SWAP plan can include searches for contaminants of interest within any of the three zones of the WS-IV watershed. Specific contaminants may be evaluated differently depending on the zone where they occur.

There was some interest expressed in expanding the contaminant inventory and also the susceptibility determination beyond the protected area in WS-IV waters based on the characteristics of the contaminant and the receiving surface water.

CONSENSUS FOR SURFACE WATER DELINEATION METHODOLOGY:

Use existing delineation method as defined in the Water Supply Watershed Protection rules. For the Source Water Assessment Program plan the protected area or the entire drainage area for WS-I, WS-II, and WS-III, delineates the assessment area. For the Source Water Assessment Program plan the protected area of a WS-IV delineates the minimum area for the assessment area. If warranted, based on expert knowledge, a larger assessment area may be established for WS-IV watersheds as determined by characteristics of specific contaminants and the receiving surface water.

In addition during the surface water work group session, the following questions and comments were recorded by Norma Murphy, DENR facilitator.

Use current delineation methods.

Current delineation meets EPA requirements.

The state's WSWP sets minimum requirements for protection ordinances but local governments can adopt more stringent ordinances.

Interstate cooperation - each state responsible for its own intake.

Focus resources on new data and analysis.

Keep WS I - III as they are but change WS-IV to be more specific to the environmental conditions of the river itself.

Use current methodology but along entire watershed.

Use current methodology but consider the total upstream drainage and watershed when evaluating contaminant inventory and vulnerability.

Use existing methodology but modify it to include contaminant sources upstream of the 10 mile protected area; this will vary by both contaminant type and stream type.

Use current methodology but use entire watershed for WS-IV's. Include additional watershed attribute data to assist in susceptibility analysis like watershed slope physiographic province etc.

Should inventory/assessment area be different for WS-IV and WS-V's than the current state delineation method ?

Support following existing methods of state's methodology for delineation unless there are watersheds in which contaminant inventories suggest otherwise.

Should there be a one-size fits all method or a case-by-case method of delineation for assessment/inventory purposes ?

Brief Summary of Surface Water and Ground Water Work Groups Contaminant Inventory Discussion

A summary of the state's proposed approach to contaminant inventory was distributed for review and comment at both the Ground Water and Surface Water Work Group afternoon sessions. The state proposes to use existing databases on contaminant inventory. All known potential sources of contamination that can be located through an existing electronic database will be identified within the delineated source water assessment area. The contaminant inventory will support the computer based, GIS approach to be used for the SWAP process. The contaminant source list in Appendix F of the SWAP Guidance will be used in conjunction with applicable databases in DENR for possible contaminants. The database search will go outside of the Department to other state agencies, local health departments, local governments, and others identified as maintaining key contaminant databases. The data will be incorporated in a GIS format and plotted on maps showing the delineated area and potential contaminant sources.

The generated maps will be sent to the public water systems in draft form to allow the system, if it so chooses, to correct data on the map or provide additional information. The water system will not be required to do anything with the draft map. If the water system makes corrections or can provide compatible data to add to the assessment, it will be incorporated and provided in the final assessment results.

The issue of contaminant inventory will be on the agenda for the October 2, 1998 Advisory Committee Meeting. In order to meet SWAP plan development deadlines consensus on the state's approach for contaminant inventory in source water assessment delineated areas will need to be reached during that meeting or in a scheduled additional meeting thereafter.

The following comments on Contaminant Inventory Strategy from Surface Water and Ground Water Work Groups were recorded by the facilitators:

How well do different state agencies that have contaminant inventory data share that with other agencies ? And how compatible are the databases ?

Identify known problems from the raw water monitoring data that is available.

Need to address non-regulated contaminants even though it may be a problem not recognized now but rather a future problem to be assessed.

Consider using EPA sediment sampling database. (Corps of Engineers, USGS may also have data)

Other sources of data, local governments, county/municipal planning departments.

Advertise for assistance from citizens through the use of public service announcements.

Use an Internet site to post the locations of contaminant sources for the education of public water suppliers.

Seasonal variability of parameters should be considered.

Use this program to guide gathering of more data. Compile metadata of data including analytical methods and procedures.

Parking Lot Issues from SWAP Plan Development Morning Session

These comments were recorded by the facilitators during the discussion. However, because they were not directly related to the ongoing discussion they were parked for later consideration at future Advisory Committee meetings.

Definition of "contaminant inventory"

-former land uses

-land practices

Definition of "susceptibility" / "vulnerability"

Distinguish between:

- 1. Ground water*
- 2. Drinking water*
- 3. Potable water*

Protection of wells: poorly constructed wells, irrigation sources contamination

Mechanism to "grandfather" /address sources that maybe affected by more stringent regulations

Substandard septic systems & wells.

Parking Lot Issues from Ground Water Work Group Session

These comments were recorded by the facilitators during the discussion. However, because they were not directly related to the ongoing discussion they were ~~Aparked~~ for later consideration at future Advisory Committee meetings.

Geologic factors

Land use/cover

Land surface/slope

Subsurface transmissivity

Parking Lot Issues from SWAP Surface Water Work Group Meeting

These comments were recorded by the facilitators during the discussion. However, because they were not directly related to the ongoing discussion they were ~~Aparked~~ for later consideration at future Advisory Committee meetings.

What program will there be to assure public distribution of information and oversee whether assessments used?

Can local governments adopt ordinances that alter the delineation of the critical area or the protection area?

For WS-IV, what criteria will be used to delineate area in which a contamination source inventory will be conducted?

What is done upstream, potentially effects downstream water quality and quantity. Therefore, look at cumulative effects rather than solely focus on discrete and linear effects.

Should there be a public advisory committee set up now to advise during implementation?

Is contamination inventory a state or local responsibility? If local, what is the oversight?

What system will be put in place to monitor changes and update advisories?

If entire watershed is delineated (WS-1- 4) then is the state obligated to complete SWAP for

watershed?

What will be the efforts for interstate cooperation in conducting SWAP and delineation in shared areas?

Are there any cases where there are overlapping protection and critical areas? If so, which ordinances are applicable? (Only WS-IVS may overlap)

Will current delineation strategy meet EPA criteria to delineate entire watershed area upstream of any intakes including WS-IV?

Summary of Suggested Benefits and Uses of Source Water Assessments

1. Integrate SWAP plans into basinwide management plans.
2. Increase public awareness of the relationship between human activities and protection of public water supplies and that they have a role in protecting water supplies.
3. Target incentive and technical assistance programs.
4. Facilitate the process for determining alternatives for disposing of waste and contaminants.
5. Local governments can use susceptibility determinations to plan for future needs.
6. SWAP plans might encourage local governments to adopt more stringent ordinances than the state minimum requirements.
7. Improve land use planning for future water uses.
8. Avoid redundancy in multiple local programs
9. Phase out landfills and increase recycling.
 1. Assist local governments in completing local water supply plans since the information is the same as required for SWAP plans.
11. Assist in identifying risk/cost of clean-ups.
 2. Compiling data into one place can assist DENR and other agencies in improving regulations and programs.
13. Help local governments in siting new wells.
 3. The data developed and compiled should be treated as a strategic resource.
15. Incentives in rules for implementing SWAP plans.
16. Focus attention on areas for additional research and monitoring.
17. Ensure quality data.
18. Incorporation of Internet access valuable for public education.
19. Integrate into land use planning guidelines that incorporate water quality.

20. Help inform developers about options for development of land.
21. Tool for discussion of relative risk.
22. Enable better decisions on economic development.
23. SWAP plans can serve as basis for source water protection by the water system owner/operator.
24. Enhance understanding of consumer confidence reports.
25. Increase consumer confidence in drinking water quality and safety.
 4. Enhance understanding by consumers of why protection and treatment strategies are implemented and how they affect water supply pricing/rates.
27. Help utilities identify contaminants and contaminant sources.
28. Help utilities prepare consumer confidence reports.
29. Emphasize importance of good well construction for drinking water supplies.
30. Increase awareness of quantity/availability of water as well as quality.
31. Foster cooperation between all users of water within a basin or watershed.
32. Allow local governments to make good decisions to improve public health.
33. Ensure equity among all who benefit with regard to costs of implementation.
34. Provide consultants with basis for designing treatment processes.
35. Tailor frequency and type of monitoring for water supply systems.

Technical and Citizens Advisory Committee Meeting
North Carolina SWAP Plan Development
October 2, 1998
Combined Morning Session

- 9:00 - 9:10 North Carolina's Proposal for Public Participation in SWAP Plan Development and Implementation, Jessica Miles, Chief, Public Water Supply Section
- 9:10 - 9:45 Facilitated Discussion on Public Participation Proposal, Norma Murphy
- 9:45 - 10:00 North Carolina's Proposal for Completing the Required Contaminant Inventory for Source Water Assessments, Raj Butalia, Computing Consultant, Public Water Supply Section
- 10:00 - 10:30 Facilitated Discussion on Contaminant Inventory Proposal, Norma Murphy
- 10:30 - 10:45 Break
- 10:45 - 11:00 Overall Approach to Determining Susceptibility of Public Water Supplies to Contamination, Bob Midgette, Supervisor, Protection and Enforcement Branch
- 11:15 - 11:30 Surface Water Vulnerability Rating System, Elizabeth Morey, Hydrogeologist, Public Water Supply Section
- 11:30 - 11:45 Ground Water Vulnerability Rating System, Gale Johnson, Hydrogeologist, Public Water Supply Section
- 11:45 - 12:00 Susceptibility Determinations for Source Water Assessments, Bob Midgette
- 12:00 - 12:15 Questions, Objectives for Afternoon Work Group Sessions, Bob Midgette
- 12:15 - 1:45 Lunch (on your own)
Afternoon Ground Water and Surface Water Work Group Sessions
- 1:45 - 4:30 Session 1 Ground Water Susceptibility Determination Approach
FACILITATOR
- Break Included
- 1:45 - 4:30 Session 2 Surface Water Susceptibility Determination Approach
FACILITATOR

Summary of the Second Technical and Citizens Advisory committee Meeting for North Carolina's Source Water Assessment Program Plan Development

Introduction

The second of three planned North Carolina Source Water Assessment Program (SWAP) Technical and Citizens Advisory Committee meetings was held in Raleigh, NC in the Parker Lincoln Building on October 2, 1998. An agenda of the meeting is attached. The morning session consisted of a series of short presentations by Public Water Supply (PWS) Section staff on components of the SWAP plan including Public Participation, Contaminant Inventory, and Susceptibility Determination. Since the Public Participation and Contaminant Inventory issues had been discussed in the previous Advisory Committee meeting they were presented briefly again and then facilitated discussions were held in the morning combined session to allow for all participants to provide comments on the state's proposed strategies. Therefore, the proposed strategies as presented to the Advisory Committee for these two components will now be considered appropriate for incorporation into the state's draft SWAP plan.

The state's proposal for determining the susceptibility of public water supplies to potential contaminant sources was presented for the first time. The afternoon break-out group sessions discussed the state's proposed methodology for determining the susceptibility of surface water and ground water public water supply intakes to potential sources of contamination.

After the meeting summary below is an important notice on some changes that have resulted since the meeting as a result of brand new guidance information from EPA. Be sure to review this section.

Brief Summary of Presentations from the Morning Session

Public Participation

Jessica Miles presented a brief overview of the state's plan for the Public Participation component of the SWAP plan. This was a review of the presentation provided in the first meeting. Following the presentation, a facilitated discussion was led by Department of Environment and Natural Resources (DENR) facilitators, Norma Murphy and Christy Osterhout, to provide opportunity for Advisory Committee participants to provide comment or make suggested additions or revisions of the state's proposed plan for the Public Participation component of the SWAP plan. The comments below were recorded by the facilitators during the discussion:

- *Concern about short-time between now and public meetings for plan development.*
- *Emphasize non-regulatory aspect of plan especially for public meetings.*

- Use a specific plan for disseminating assessment information to specific groups - water suppliers, etc., local planning organizations (Council of Governments), NC American Planning Association., League of Municipalities, NC Medical Society, AARP, AIDS services groups, Health Directors, River Basin Organizations.
- Incorporation of SWAP information into DWQ Basinwide plans for program priority setting and plan development.
- Uncertainty of information (limitations & assumptions need to be clearly presented in the plan).
- Another meeting to oversee *Worst cases, or False sense of security* may be necessary. Make sure plan doesn't scare public.
- Minimum set of data to report to ensure uniformity/credibility.
- Specific ways to disseminate information: Internet, send post cards with URL.
- Great way to teach the public (public health).
- University extension services should be utilized.
- Public service announcements on radio & TV (NC Now, PBS).
- Mass mailing (system or general public or town elders); format an email announcement of the SWAP plan for different environmental list-servers.
- Annual meetings (League of Municipalities and other groups) get on their agenda for SWAP presentations.
- AIDS services groups, Local Health Directors, Medical Doctors need to be informed.
- Farming communities - worst case scenario (oversee development of plan - another meeting).
- Need for addressing data voids & data concerns.

These comments and suggestions will be incorporated into the state's proposed Public Participation component for the draft SWAP plan as deemed appropriate by PWS staff.

Contaminant Inventory

Raj Butalia, Computer Consultant, PWS Section, presented the state's proposed strategy for the Contaminant Inventory component of the SWAP plan. North Carolina's SWAP plan needs to specify the contaminants of concern and the significant sources of the identified contaminants. The majority of the contaminants of concern are specified in the Safe Drinking Water Act, i.e. the Primary Drinking Water Standards. There are a few additional contaminants regulated by the PWS Section in North Carolina. The state will focus its efforts on acquiring data for potential sources, and thus for the contaminants. All potential sources in the delineated assessment area will be identified from electronic databases.

The sources of the electronic databases include the Environmental Protection Agency's regulatory programs (RCRA, TRI, CERCLA, NPL, non-NPL), DENR's regulatory programs (Divisions of Land Resources, Waste Management, and Water

Quality, as well as other state agencies (Department of Health and Human Services, Employment Securities Commission, NC Department of Agriculture). A draft written summary of the state's strategy, AProposed Contaminant Inventory for North Carolina SWAP@ was provided to Advisory Committee participants and is included as an attachment for anyone unable to attend the October 2nd meeting. Also included as Attachment 1, is a table of A Databases identified that will be used for assessment purposes@, that lists possible contaminant source databases as well as other GIS data that will be used in the assessment process.

Following the presentation, a facilitated discussion was led by Department of Environment and Natural Resources (DENR) facilitators, Norma Murphy and Christy Osterhout, to provide opportunity for Advisory Committee participants to provide comment or make suggested additions or revisions of the state's proposed plan for the Contaminant Inventory component of the SWAP plan. The comments below were recorded by the facilitators during the discussion:

- *Need for agriculture data (land use, animals, crop patterns, chemical use); problem - crops by county reported at year's end;*
- *How to present data uncertainty, limitations and assumptions;*
- *UST incident list;*
- *Pesticide dealerships list - restricted use (see Henry Wade);*
- *Potential contaminant source list - remove military installations from list but include potential contaminating activities (Gary Davis will provide list from Camp Lejeune) - contact other military bases;*
- *Waste spills database;*
- *Generic category for other military sources;*
- *Microbiological contamination needs addressing;*
- *Pesticide releases (Henry Wade);*
- *Database of animal operations available.*

These comments and suggestions will be incorporated into the state's proposed Public Participation component for the draft SWAP plan as deemed appropriate by PWS staff.

Susceptibility Determination

Bob Midgette presented the overall approach to ADetermining Susceptibility of Public Water Supplies to Contamination.@ The state proposes to delineate ground water source PWS systems in accordance with North Carolina's approved Wellhead Protection Program. The state proposes to delineate surface water source PWS systems as defined in the Water Supply Watershed Protection Rules with some consideration for

increasing the assessment area for WS-IV watersheds if warranted based on expert knowledge.

Because of the need to prioritize PWS systems due to limited time and resources available for SWAP plan assessments to be completed the state proposes to use a phased approach to the assessments. Transient non-community systems will be assessed according to the Phase I susceptibility determination procedure. Community systems and Non-transient Non-community systems will be assessed according to a combined Phase I and Phase II susceptibility determination. The procedure for susceptibility determination for ground water and surface water PWS intakes is described in detail in two draft documents (ASurface Water System Susceptibility Determination Procedure@and AGround Water System Susceptibility Determination Procedure@) that were distributed to participants at the October 2nd meeting and are included as attachments for anyone unable to attend.

Briefly, for a Phase I assessment, after delineation is completed, the inherent vulnerability of the intake shall be determined based on a set of specific factors for both ground water and surface water sources. Elizabeth Morey and Gale Johnson, gave presentations providing detail on how the inherent vulnerability of surface and ground water intakes will be determined. After the inherent vulnerability rating is determined then a potential contaminant source rating will be determined for each intake. The two ratings will then be mathematically combined to equally consider both the inherent vulnerability of the intake and the potential contaminant sources identified within the delineated area. The results of all these Phase I assessments will be converted to a percentile ranking. The percentile ranking will be divided into five equal parts or quintiles. The highest ranked 40 percent, including any systems with monitoring results indicating raw water contamination, will be assessed further according to the Phase II procedure. The Phase II susceptibility determination procedure will utilize an evaluation of the number of potential contaminant sources within a refined risk category of lower, moderate, and higher, and the location of these sources within the delineated assessment areas. The result is a determination for each Phase II assessed public water system of an overall susceptibility category of higher, moderate, or lower. This approach provides a relative comparison of susceptibility for a public water system to other assessed public water systems.

Summary of Surface Water Work Group Session

The afternoon breakout session for surface water walked through the 10/1/98 draft document "Surface Water System Susceptibility Determination Procedure" that was handed out at the start of the meeting.

Step 1: No elaboration of delineation occurred.

Step 2: Inherent Vulnerability

Table 1. Intake Characteristic Factors

Watershed Classification.

The group liked the use of the watershed classification structure in the table. It was noted that there was a typo in Column 2 - one of the WS-IVs should have been a WS-V. The result of the discussion was the conclusion that the WS-III classification should be with the moderate Vulnerability as the WS-III has more similarities with the land use restrictions of the WS-II than the WS-IV.

Intake Location

Several group members were not familiar with the distinctions between Class 1, 2, and 3 reservoirs. Class 1 are single purpose drinking water reservoirs with specific restrictions controlling the shoreline, while Class 3 are large multipurpose reservoirs like Falls Lake, Jordan Lake and Lake Norman. Land use controls around Class 1 and 2 are much tighter, affording greater public health protection. Direct stream intakes have fewer protections. Some discussion about the fact that run-of-river intakes can pass pollution more quickly downstream past the intake, while reservoirs need more time to flush contaminants. Their vulnerability to variations in water quality was an issue. Since their vulnerability to acute contaminants was at least as great as for impoundments, the consensus was to leave it as it was, but to consider reducing the score for moderate and lower vulnerability to maybe 4 and 2 as determined by PWS Section staff.

Raw Water Quality

There was substantial discussion about how best to incorporate concerns about the actual water quality at the intake into the susceptibility analysis. Surface water plants

routinely monitor for several water quality parameters, including coliform, turbidity, and color. Discussion around the Department's system of classifying the use support was questioned as a possible surrogate: fully supporting, partially supporting, use threatened, and not supporting. That stream water quality rating system was explained to be based on biologic or chemical data if data were available and on the agency's best professional judgement if data was not readily available. Since the plant data is actual data at the intake, it was chosen as a better measure of water quality, even though no plant data is gathered for contaminants like organic chemicals. It was decided to add a row to the table to add the use support category, but NOT to assign points to it and not factor it in to the calculation, but rather as additional information for the water system and general public.

One issue that was not resolved at the meeting was the need to put some sort of definition on the raw water quality standard vulnerability determination. Having "Exceeds Standards" or "> 50% of Standards" does not provide the associated time frame for the measurement. Is it worst case? Worst day each year? The 90th percentile? The Public Water Supply Section was instructed to refine the definition to clarify the intent.

Watershed Characteristics Evaluation

The watershed characteristic evaluation is expected to include an analysis of land use/land cover, population density, soil type, precipitation patterns, geology, and land slope. This analysis, expected to be contracted with USGS, would be one method of getting at nonpoint water quality impacts where detailed data sets are not available. The group was very supportive of this type of analysis factoring into the overall susceptibility determination approach. One source of data to look at is the Agricultural Statistics Division.

Step 3 Contaminant Inventory/ Rating

Table 2 from "Surface Water System Susceptibility Determination Procedure" was not discussed in any depth, as it had been covered in the combined morning session. There was some elaboration from the text in how the ranking of H,M,L would be assigned. For databases of known regulated contaminants, such as exists in DENR, higher would be assigned based on professional judgement. For databases of facilities likely to use regulated contaminants, the table grouping facilities as higher, moderate and lower would be used, as developed from EPA and Oregon's WHP program and modified by PWS staff.

Table 3 from *Surface Water System Susceptibility Determination Procedure* discussions did lead to the desire to change the table. The committee determined that there was a need to normalize the watersheds, or for example, to calculate the surface water contaminant rating ***per unit of watershed area***. The final weighting factors in Table 3 may be adjusted to facilitate an easier combining of the Inherent Vulnerability calculated in Step 2 with the Contaminant Rating generated in Step 3. The relative weights should stay the same. In order to get a Contaminant Rating with a meaningful number, once the weighting is done, the final unit may be something like number of contaminant units per 10 square miles, or per 100 acres, or something similar. PWS should adjust the multiplier to get something understandable. It was also recommended that when the watershed area calculations are done, to be sure not to include the surface area of the water body.

Step 4. Susceptibility Rating/Priority Screening

There were no comments or questions on Step 4.

Step 5. Susceptibility Determination - Phase I

There was not a broad support for the A-E ranking concept. The surface water work group felt that once the decision was made for a particular system to proceed with a Phase II or not was all the relative ranking that was necessary. PWS expressed some concern that there might be an assumption that systems that did not get a Phase II susceptibility determination were not vulnerable, while the number of systems that will go through the Phase II procedure is driven by resource constraints, not the need for further assessment. Information on higher/moderate/lower risk for the various categories should be provided to the water systems as the assessment. Providing the relative rankings was seen as potentially detrimental and misleading. Remember that being lower on the relative ranking list would not necessarily equate directly to real risk of contamination.

It was recommended that the passing out of the draft assessments to the water systems be added as a separate step after Step 5. It was agreed that Phase 1 assessments would be distributed to all water systems upon completion, even those slated for a Phase 2 work.

Step 6. Susceptibility Determination - Phase II

Table 4 from *Surface Water System Susceptibility Determination Procedure* was not changed. There was some clarification provided about the rating values. Table 4 is representative of the type of more specific information believed to be available for regulated contaminant databases. It is the supposition of the PWS Section that most of the regulatory programs behind these databases will have some statutory or regulatory distinctions between operators or facilities that exist. In cases where that split between what can be classified as higher, moderate, and lower is included in the statutes or rules, that split will be made. In cases where guidance on relative risk has not been predetermined, the approach will be to rank all occurrences and group by thirds as higher, moderate, and lower. For example, if quantity of a certain contaminant is found in a database, such as metal finishers, and ranges between 500 and 4000 gallons, the facilities would be sorted by quantity and then given a relative rank. This was decided to be preferable to trying to go contaminant by contaminant and set specific quantity thresholds as a group without a lot of data to support one level versus another.

There was some discussion about the need to include consideration of the size or type of NPDES discharge. In Phase I, one small package plant of residential wastes would be counted as one potential contaminant source, as would one large municipal discharge receiving waste from an industrial pretreatment facility. The question was raised if this shouldn't be better differentiated in Phase I than Phase II. The PWS Section's response to this question was the concern of differentiating between different types of contaminants in Phase I. Similar breakdowns are possible for probably any database found. If we try to get more specific data for NPDES dischargers in Phase 1, then each group with interest in a particular contaminant group would probably request the same differentiation for their particular facility or contaminant. This would, in effect be a commitment to doing Phase II level analysis for all water supplies, for which the resources are insufficient. Others in the subcommittee echoed their interest in expanded detail in their area of interest if another facility type received the higher level of detail. PWS committed to consideration of this issue.

Table 5 from *Surface Water System Susceptibility Determination Procedure* was discussed in some detail. Some clarification of zones was provided. For WS-I and WS-II, the zones that exist are the critical area, and then the rest of the watershed which is protected. A titled zone of Protected officially exists only for a WS-IV watershed, which is the 10 mile radius drainage area. Therefore, the zones in the first column should be amended to read, Critical; Watershed (WS-II, III); Protected (WS-IV); Watershed (WS-IV, V); and Total. Note that switches the order of the second and third row headings. It was also noted that the asterisk should be associated with the word *Total* not the number 10. As discussions about the numbering system progressed, it was agreed that

consistent with Phase 1 Assessments, if relative rankings are not published, then the numbers in the table become irrelevant. It was agreed that the PWS Section and DENR may continue with the ranking system in order to help guide DENR priorities for work.

Summary of Ground Water Work Group Session

The afternoon breakout session for ground water centered on the 10/1/98 draft Ground Water System Susceptibility Determination Procedure that was handed out at the start of the meeting.

Step 1: Delineation

As the delineation methodology was the topic of discussion at the September 3rd meeting no further discussion was required.

Step 2: Inherent Vulnerability of the Aquifer

The meeting began with a discussion of Table 1. Aquifer Rating Based on Water Transmitting Characteristics. Concerns were raised with regard to the relative ratings assigned to the aquifers and ground water sources listed in the table. Many of the concerns centered on the observation that the aquifer ratings did not take into account water table depth below land surface or the material overlying the aquifer. It was pointed out that the aquifer rating was a relative measure of the transport characteristics of the different aquifer materials and did not consider any mitigating factors associated with the unsaturated zone. It was further noted that these factors were considered separately in the unsaturated zone rating. At this point the group decided that it would be more appropriate to discuss the unsaturated zone rating and, once completed, to return to the discussion of aquifer rating.

Unsaturated Zone Rating

The discussion of the unsaturated zone rating began by informing the group that the state is considering contracting with the USGS to develop an unsaturated zone rating system. The group was informed that, if developed, the GIS based system would use a combination of selected factors to assign an unsaturated zone rating to each PWS

ground water intake. The selected factors (land use/land cover, hydraulic conductance, and land-surface slope) are those that contribute to the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. Following a discussion of the procedure for rating and weighting the contributing factors the group recommended that land use/land cover should be weighted relatively very high. The group further recommended that, once developed, the unsaturated zone ratings along with the rating and weighting values assigned to the contributing factors should be confirmed with historical data, literature review, and expert opinion. The group inquired as to the possibility of obtaining hydraulic conductance values and depth of the water table information from county soil surveys. It was pointed out that information available from county soil surveys might suffice in areas with shallow water tables but would be insufficient in many areas. It was also noted that existing digital elevation models combined with statistical information on the depth below land surface of the water table in different regions would be used to calculate the thickness of the unsaturated zone.

Several work group members felt that information on well construction and improperly abandoned wells should be included in the unsaturated zone rating. After discussing this issue it was agreed that problems associated with improperly constructed and abandoned wells were typically addressed on a site-specific basis as identified and could not be considered up front. It was also pointed out that the inherent vulnerability analysis, of which the aquifer and unsaturated zone ratings are components, refers only to the geologic/hydrogeologic characteristics of the delineated area. Anthropogenic influences on the vulnerability of the ground water intake are not considered at this stage of the analysis. If information concerning improperly constructed and abandoned wells is to be factored into the SWAP plan, it would be in some other component of the analysis. The group was informed that PWS systems would be given the opportunity to review the information supporting the Phase I assessments for corrections and/or to add information for use in the assessments. It is possible that information received from PWS systems concerning improperly constructed and abandoned wells could be incorporated into Phase II assessments. However, absent this information, PWS wells would be considered to be properly constructed. The group recommended that assumptions such as this should be clearly stated in the SWAP.

Aquifer Rating

Table 1. Aquifer Rating Based on Water Transmitting Characteristics

Members of the work group stated that the term "highly confined aquifers" is a misnomer and that such aquifers do not actually occur in North Carolina. Evidence was cited of wells screened in the water table aquifer responding to withdrawals from deeper, supposedly confined aquifers. The group agreed that aquifer designations such as "Highly Confined," "Leaky-Confined," and "Semi-Confined" should be avoided. It was also agreed that references to specific hydrogeologic unit names (e.g., Castle Hayne Aquifer) should be removed. The group recommended that coastal plain aquifers should be designated as "Deep Confined," "Shallow Confined," and "Unconfined" with examples given of where they typically occur (e.g., Deep Confined (Kinston area), Shallow Confined (Pamlico County), Unconfined (Sand Hills area), etc.). Some members of the group felt that fractured rock aquifers should likewise be divided into shallow and deep categories. It was felt that ground water from deeper fracture zones was more protected from surface and shallow sources of contamination than ground water from shallower fracture zones. However, the categorization was rejected due to the fact that rock wells are typically open hole wells with the potential for fractures occurring at any depth to yield water to the well. Concern was expressed that an aquifer rating of 1 (lowest vulnerability) might lead some PWS systems to regard their intakes as not vulnerable to contamination and result in their disregarding possible contaminating activities and sources. It was explained however, that the aquifer rating was relative to other aquifers and not an absolute measure of aquifer vulnerability.

Table 2. Example matrix used to establish an inherent vulnerability rating for ground water sources of public water supply by addition of the source aquifer and unsaturated zone ratings.

No objections were raised to the equal weighting of the aquifer and unsaturated zone ratings.

Step 3: Contaminant Rating

Table 3. Example Databases Containing Information about Known Potential Contaminant Sources

Group members pointed out that Farmers for Fairness had a database of all reported sewer spills in North Carolina. It was suggested that this database could be used to locate areas with chronic sewer problems. In a similar fashion, sections of

highways with a high incidence of traffic accidents involving spills and releases should be identified.

Table 4. Ground Water Contaminant Rating

The question was raised as to whether or not a single, high risk potential contaminant source within the delineated area should result in the ground water intake be designated as highly susceptible to contamination. It was pointed out that the contaminant rating is only one component of the susceptibility determination. A single, higher risk potential contaminant source would be more or less significant to the susceptibility of the ground water intake depending on the inherent vulnerability of the aquifer. The group was in agreement that the number of potential contaminant sources, along with their risk category, should figure into the overall susceptibility determination.

Due to time constraint, the Ground Water Group session ended at this point with the group deciding to resolve any remaining issue via conference calls and email.

IMPORTANT NOTICE - CHANGES SINCE THE OCTOBER 2ND MEETING:

One day after the Advisory Committee meeting, an official correspondence arrived by e-mail from EPA stating that state SWAP plans were required to provide a final, bottom line, assessment result for each system or a relative ranking system, and that the presentation of the material in the tables or in a GIS system data layer as the assessment, as favored by the Advisory Committee, would be rejected by EPA. This new information, combined with the Advisory Committee meeting requires that we rethink our strategy.

It appears that EPA would approve a plan with the A-E in the 10/1/98 proposals, as relative assessments are approvable, but there was interest by the stakeholders in staying away from relative assessments. If we do not provide relative rankings, even by groups like A-E, then a definitive answer for each system is required. The DENR steering committee is working on a revised proposal that would result in a final assessment result for each system by combining an overall H, M, L (higher, moderate, lower) for Inherent Vulnerability with an overall H, M, L for Contaminant Characteristics, to give a final assessment result for each system of H, M, or L, or perhaps a Yes/No on vulnerability. The interim tables would still be provided in the assessment.

We are also evaluating the ease of moving to incorporate the concept of the Zones, or proximity to the source, from Phase II to Phase I and dropping the Phase concept (but not the priority for more detail concept). Once the assessments were distributed to all system, we would focus the subsequent work (what was Phase II) on the protection activities of trying to provide more contaminant specific detail to the most susceptible systems (as was proposed previously). From that effort, we could provide procedures and guidance for systems that were not susceptible enough to get state assistance with subsequent database review to initiate additional protection efforts on their own.

This approach should receive EPA approval, while providing more specific useful information to public water systems, staying away from a grouped ranking, and providing more definite answers to the water system.

Technical and Citizens Advisory Committee
North Carolina SWAP Plan Development
Meeting Agenda
November 5, 1998

- 9:00 - 9:15 Advisory Committee Comments on Proposed Susceptibility Determination Procedure; Jessica Miles, Chief, Public Water Supply Section
- 9:15 - 9:30 Overview of Revisions to Susceptibility Determination Procedure; Bob Midgette, Supervisor, Protection and Enforcement Branch, PWS Section
- 9:30 - 10:00 Revised Surface Water System Susceptibility Determination Procedure; Elizabeth Morey, Hydrogeologist, Protection and Enforcement Branch, PWS Section
- 10:00 - 10:30 Revised Ground Water System Susceptibility Determination Procedure; Gale Johnson, Hydrogeologist, Protection and Enforcement Branch, PWS Section
- 10:30 - 10:45 Break
- 10:45 - 12:00 Facilitated Discussion of Revised Susceptibility Determination Procedure; Norma Murphy, Facilitator
- 12:00 - 1:30 Lunch (on your own)
- 1:30 - 2:00 Overview of Draft SWAP Plan; Bob Midgette
- 2:00 - 3:00 Facilitated Discussion of Draft SWAP Plan; Norma Murphy, Facilitator

Summary of the Third Technical and Citizens Advisory Committee Meeting for North Carolina's Source Water Assessment Program Plan Development

Introduction

The third of three planned North Carolina Source Water Assessment Program (SWAP) Technical and Citizens (TAC) Advisory Committee meetings was held in Raleigh, NC in the Parker Lincoln Building on November 5, 1998. An agenda of the meeting is attached. The combined Surface Water and Ground Water work group session consisted of a series of short presentations by Public Water Supply (PWS) Section staff on revisions to the Susceptibility Determination procedure and an overview of the Draft SWAP plan. The Susceptibility Determination procedure was revised to incorporate suggestions received during the October 2, 1998 TAC Advisory Committee meeting. Facilitated discussions on the revised Susceptibility Determination procedure and the Draft SWAP plan were conducted. Because the discussions were inclusive of PWS systems regardless of source there were no breakout work-group sessions for ground water and surface water.

Brief Summary of Presentations

Jessica Miles presented a brief overview of the October 2, 1998 comments of the TAC Advisory Committee and how they were incorporated into the revisions of the Susceptibility Determination procedure. Additionally, it was explained that TAC Advisory comments were included appropriately by Staff in several sections of the draft SWAP plan.

Susceptibility Determination

Bob Midgette presented the revisions to the state's overall approach to **Determining Susceptibility of Public Water Supplies to Contamination.** The revised procedure as detailed in Chapter 2 of the Draft SWAP plan, combines descriptive ratings for inherent vulnerability and contaminant rating that results in a qualitative rating for susceptibility of higher, moderate, or lower for each

PWS system. The state believes these revisions will satisfy EPA's requirement for a susceptibility determination for all PWS systems. Also, this procedure will minimize the potential for inappropriate use of SWAP results to directly compare or rank PWS systems while maintaining the ability to prioritize PWS systems for the Phase II susceptibility determinations. Elizabeth Morey and Gale Johnson made short presentations on the revised surface and ground water susceptibility determination procedures. This led into a facilitated discussion with all attendees. The participants were asked to share their ideas on the revised susceptibility determination procedure and to reach consensus for the Draft SWAP plan. The following comments were recorded by Norma Murphy, DENR facilitator:

- *can we make plan changes after finalization?*
- *GW/Surface contamination i.e. fertilizer should also be listed in residential/municipal*
- *forest mgt. move off moderate list - Christmas tree/shrubbery mgt. should be separated out*
- *amount of source information released on Internet*
- *results format in reports and call meeting to discuss format*
- *salt water intrusion...a contamination source?*
- *conduct pilot before public meeting/finalization*
- *qualify databases*
- *funeral homes listed in contaminate inventory?*

Following the facilitated discussion the TAC Advisory Committee was asked if there was consensus on the revised susceptibility procedure and all agreed that the new procedure was satisfactory.

Bob Midgette and Gale Johnson reviewed the Draft SWAP plan with emphasis on the sections that were added to the Draft that was available at the meeting. These sections included conjunctive delineation, delineation of recharge areas not adjacent to ground water intakes, consideration of well integrity, and proposed schedule of completion for SWAP activities. This led into a facilitated discussion with all attendees. The participants were asked to share their ideas on the Draft SWAP plan. The following comments were recorded by Norma Murphy, DENR facilitator:

- *database quality needs correction*
- *pilot study PWS systems need to agree to perform verification of assessment results*
- *disseminate pilot study data to appropriate parties*
- *include rural water groups & AWWA for final rollout of plan*
- *program implementation section should refer to idea of continual improvement*

Following the facilitated discussion the TAC Advisory Committee was asked if they were satisfied with the Draft SWAP plan. It was agreed that the Draft SWAP plan was acceptable. The participants were thanked for their contributions to the SWAP plan development and were reminded that further input may be sought by the state as the implementation of the SWAP plan progresses.