

National Drinking Water Advisory Council

Summary of Meeting November 8-9, 2000

Marriott Residence Inn at Pentagon City
Arlington, Virginia

Members of the NDWAC:

Dr. L.D. McMullen, Chairperson
Ms. Mary Pesina Baiza
Dr. William Bellamy
Mr. Richard J. Coombe
Mr. Henry Duque
Dr. Jeffrey K. Griffiths
Mr. Kenneth J. Merry
Ms. Diana Neidle
Ms. Cynthia J. Roper
Mr. John P. Scheltens
Mr. Dennis Schwartz
Dr. David P. Spath
Mr. Peter D. Thornton
Dr. Thomas Yohe
Dr. Richard Bull, Science Advisory Liaison Member

NDWAC Members Absent:

Ms. Valerie Lemmie

EPA Staff:

Mr. Jim Cogliano, Office of Research and Development
Ms. Cynthia Dougherty, Director, Office of Ground Water and Drinking Water (OGWDW)
Dr. Fred Hauchman, Office of Research & Development, Research Triangle Park, NC
Mr. Ephraim King, Chief, Standards & Risk Reduction Branch, OGWDW
Mr. Mike Osinski, Special Assistant to Cynthia Dougherty, OGWDW
Ms. Janet Pawlukiewicz, Chief of Staff, OGWDW
Ms. Charlene E. Shaw, Designated Federal Officer, OGWDW
Mr. James Taft, Director, Acting Director, Standards and Risk Management Division, OGWDW

Others Attending All or Part of the Meeting:

Mr. Steve Albee
Ms. Rebecca Calderon
Mr. Bill Diamond
Ms. Judy Lebowich
Mr. Ben Smith
Ms. Evelyn Washington

WEDNESDAY, NOVEMBER 8, 2000

I. Opening Remarks-Dr. L.D. McMullen/Ms. Cynthia Dougherty/Dr. Richard Bull

- The Chair of the National Drinking Water Advisory Council (NDWAC) welcomed the participants, referred to the ongoing election process, and dealt with housekeeping issues.
- Ms. Cynthia Dougherty discussed the transition process at EPA following an election. EPA will have a number of changes at the political senior executive level this coming year. NDWAC will continue to try to assure the safety of drinking water although there may be slight changes in priorities as time goes on. The NDWAC meeting has been reduced from two and one-half days to one and one-half days for this meeting only.
- Dr. McMullen introduced the topic of the roles of the NDWAC and the Science Advisory Board in regulation development. Included in the meeting packet was a write-up of the charter for the NDWAC and a description of the activities of the Drinking Water Committee of the Science Advisory Board.
- Dr. Richard Bull described the Drinking Water Committee (a sub-committee of the Executive Committee) and the role of the Science Advisory Board (SAB). He described the roles of the NDWAC and the SAB as complementary. EPA OW puts proposals before the SAB for comment, and SAB will review some but not all, trying to limit comments to the science that bears on the issue. When reports are forwarded from the Drinking Water Committee to the Executive Committee, opportunity exists for comment from both the Office of Water and from other persons on the Executive Committee. The report will also be forwarded to another committee of the SAB, the Research and Strategies Advisory Committee. Dr. Bull sees the need for collaboration between NDWAC and SAB on drinking water issues arising during the coming year due to the overlap involved. Some activities that fall into this category from the Office of Research and Development include:
 - - CCL Research Plan
 - Comprehensive Research Strategy

Some activities from the OGWDW include:

- Arsenic Rule;
- MDBP Health Risk Reduction Cost Analysis;
- MDBP Proposal;
- TMDL allocations;
- CalFed Process; and
- Sulfate Advisories.

II. Council Discussion and Recommendations

- Dr. McMullen emphasized that the NDWAC has the opportunity to work on the policy side of issues whereas the SAB doesn't.
- In response to a question from a member, Dr. Bull explained that the Executive Committee was the same as the SAB. Chairs of standing committees are members of the Executive Committee. There may be liaisons to other committees for example, the Science Advisory Panel regarding pesticide regulation and impacts of pesticides on drinking water.
- Dr. McMullen noted that not all drinking water regulations go to the Drinking Water Committee, but perhaps another committee of the SAB, for example, the Radiation Advisory Committee, Economics Committee, or Environmental Health Committee or joint subcommittees thereof.
- In response to a question from a member, Dr. Bull responded that issues are brought before the Drinking Water Committee of the SAB usually in response to a charge from OGWDW.
- To clarify a question by a member, Dr. Bull explained that the SAB is different from the National Research Council of the National Academy of Science, although sometimes, as was the case with arsenic, reports and recommendations may overlap.

III. Update on EPA Regulatory Actions-E. Washington/James Taft/Ephraim King

MTBE-Ms. Evelyn Washington

- MTBE, although reducing harmful air emissions, has become a big issue for the Drinking Water Program. Five to ten percent of the community drinking water systems in areas that use oxygenates have occurrence of MTBE, although most below the current 20-40 µg/l drinking water advisory (based on taste and odor). A larger problem concerning MTBE exists with private drinking water wells and surface water contamination.
- EPA is currently working on a secondary standard for MTBE based on taste and odor, as well as public welfare. The proposed secondary standard will be published by the end of the year and a final standard to follow shortly thereafter.
- EPA is also looking at updating the health advisory for MTBE based upon new information from the Office of Research and Development interpreting pharmacokinetic data on MTBE toxicity by ingestion through drinking water. Following creation of a health advisory, the drinking water advisory will be updated, as well as MTBE's status on the Contaminant Candidate List (CCL) and Unregulated Contaminant Monitoring List. Monitoring of MTBE by drinking water systems (all large and representative small systems) is to begin in January of 2001.
- EPA is also working on a proposal under TSCA, Section 6.0, to eliminate or ban the use of MTBE. This proposal is expected in February or March of 2001.
- Cleanup of MTBE-contaminated areas (primarily from underground storage tanks) is currently occurring under the Superfund program.
- In conjunction with the USGS, EPA conducted a study of MTBE occurrence in public water systems of 12 northeastern states. The report should be available in final form during the next few months.

Response to Questions:

- The issue of multiple routes of exposure is dealt with by EPA through an analysis called Relative Source Contribution. The appropriateness of applying data on exposure to MTBE from inhalation near gasoline pumps to a drinking water standard was questioned.
- Dr. Spath spoke on the health effects of MTBE. CA regulates using risk of carcinogenicity (1 in one million) as the principal endpoint. Carbon absorption and air stripping are current treatment measures although research on more effective treatment is ongoing.
- MTBE is not likely to have a determination made by EPA by August 2001. EPA requires more conclusions regarding health effects.
- A secondary standard based on odor and taste, as is the case with MTBE currently, is not federally enforceable. It acts as an industry benchmark. Some states, like CA, make their secondary standards enforceable.
- The OGWDW's position is that the loss of groundwater due to MTBE contamination, and concomitant loss of production facilities, is a serious issue, aside from potential for health effects.
- Use of Superfund funds for cleanup of underground storage tank leaks and MTBE contamination was considered interesting by the group.
- Movement of plumes from leaking underground storage tanks, impacts on wells, movement in ground water of MTBE versus other constituents of gasoline, slowness of dissipation, lack of MTBE monitoring requirements, and other research regarding MTBE was mentioned. A lot remains unknown regarding the extent of MTBE contamination of ground water and there is the potential for the situation to get worse as monitoring and research increases.

Arsenic-Mr. James Taft

- EPA's Proposed Rule accepted comments on proposed arsenic concentrations in drinking water of 0, 3, 5, 10, and 20 µg/l. The proposal suggested that community water systems be fully covered, however simply monitoring and reporting be applied to non-transient/non-community water systems. EPA suggested a five year time frame for small systems to come into compliance.

EPA also solicited comment on whether they appropriately exercised their benefit-cost discretionary authority to move away from the feasible level approach.

- The Proposed Rule is controversial regarding agreement on potential health effects, high costs associated with removal, and effects on small water systems.
- A study by Harvard University, published in the July issue of "Environmental Health Perspectives," recalculated the estimated lung and bladder cancer risks from arsenic ingestion in drinking water to be approximately double that estimated in EPA's June proposal. Thus, the issue of combined risk becomes of particular concern.
- The Notice of Data Availability (NODA) published by EPA also included a sensitivity analysis incorporating information on cooking practices in the study population. Availability of new information with respect to cost curves, as well as updated cost curves, was also included. EPA is currently accepting comments on the NODA.
- The appropriations bill language, signed by the President into law, changes the underlying Safe Drinking Water Act (SDWA) language regarding the deadline for the final arsenic rule, to no later than June 22, 2001.

Radon-Mr. James Taft

- EPA proposed, in November of 1999 (with a 90 day comment period), an MCLG of zero based upon no threshold for ionizing radiation. An outcome to the SDWA Amendments, an MCL of 300 was proposed, and use of a higher, Alternative MCL (AMCL) if either a state adopts and has approved a multimedia mitigation (MMM) program or, in the absence of a state program, if an individual community water system elects to develop an MMM program. The AMCL level is 4,000 picocuries/l. It is basically a physical-chemical factor taking the ambient outdoor level of radon and the air/water transfer factor to come up with the AMCL.
- The EPA proposal also listed four MMM criteria that states or community water systems would need to address. Also proposed was that community water systems be covered, but not non-transient/non-community water systems, based on estimates of risk.
- EPA believes that the AMCL/MMM approach is more cost effective and provides a greater opportunity for health risk reduction. 95 percent of the risk or more from radon comes from indoor air, with about 5 percent or less coming from water.
- EPA estimates that the majority of states will elect to go with the MMM program which means that the community water systems in those states will take advantage of the 4,000 picocurie/l MCL. There has been Congressional concern, and concern, especially in CA, that threats of tort litigation may arise over the use of the 4,000 MCL rather than the lower 300 limit. So far, no legislation in a final format has addressed this issue, although a directive to the GAO to do an analysis of costs and benefits was issued.
- The costs are not as controversial an issue as with the Arsenic Rule. The final rule deadline is early 2001.

Non-Radon Radionuclides-Mr. James Taft

- The EPA is using a NODA as a stepping stone between the 1991 proposal and the final rulemaking. There is a court-stipulated deadline based upon an agreement with litigants (the Bull Run Coalition) of November 21, 2000. The NODA relied on Federal Guidance Report 13, for health effects information and provided costs and benefits information. EPA plans to essentially keep in place the numbers that are represented in the current regulation: 5 picocuries combined for radium-226 and 228, a gross alpha limit of 15 picocuries per liter, beta and photon emitters of 4 millirem with a look-up table, and 20 µg/l for uranium (principally as a concern over kidney toxicity).
- The uranium limit is one of the controversial parts of the proposed rule and EPA is accepting comments on a higher level, such as 40 or 80 µg/l. The recommendation given to the Agency from the San Francisco meeting was that if the Agency decides to move off of the feasible level,

that it must give clear and directed consideration to both quantifiable and non-quantifiable benefits, particularly in reference to kidney toxicity.

Ground Water Rule-Mr. Ephraim King

- EPA has completed the comment period and is moving to the final rule. EPA received comments from approximately 250 organizations and 3,300 individual comments. The final rule is expected in mid- to late-2001.
- There are five key parts to the Ground Water Rule. The strategy of this rule is to take an incremental approach to targeting high-risk areas. When the high-risk areas are identified, the sources involved will have to take one of four kinds of corrective action - correct a significant deficiency, remove the source of contamination, go to a new source, or if they choose, go to disinfection. This rule does not require disinfection across the board for all systems in the country.
- The NDWAC recommended to EPA that it strongly consider monitoring both bacterial and viral contaminants. The group also recommended that all systems across the country (even if they are not in sensitive hydrogeologic areas) conduct some level of monitoring. The group also recommended that EPA go with sanitary surveys and was reluctant to recommend that EPA specify a minimum list of significant deficiencies.

LT1/Filter Backwash-Mr. Ephraim King

- The LT1 Rule applies the 1998 Interim Enhanced Surface Water Treatment Rule requirements to systems serving under 10,000 persons. The proposal received 67 comments and EPA expects a final rule this year. The Rule establishes a new performance requirement of 0.3 NTU 95% of the time and a maximum turbidity limit of 1 NTU, requiring individual filter turbidity monitoring, and also requiring that systems, in preparation for compliance with the Stage 1 disinfection by-product rules, create a baseline of microbial inactivation.
- The NDWAC recommended to EPA that small systems conduct a baseline for microbial protection if they are going to make changes on disinfection by-products. The group also supported individual filter monitoring for all sizes of systems, and strongly recommended that EPA develop fact sheets, training, and technical assistance. EPA is proceeding in each of those areas.
- The Filter Backwash Recycling Rule deals with those systems that clean their filters and backwash them, recycling the backwash somewhere in the treatment train as opposed to putting it into lagoons or sending it off as a direct discharge to surface waters. EPA received 67 comments on this rule as well and a final rule is expected this Fall.
- EPA's current perspective on the rule, after considering comments, is to require systems to return recycle flow to the head of the plant, identify who they are to the States, provide some basic information about their recycle practices, their flows, their volumes, and let them work directly with the states to determine hazards and appropriate steps to take.
- Examples of hazards from backwash recycling include a recycle flow that exceeds the design parameters established by some states for particular systems.
- The NDWAC recommended that no direct recycling be allowed for direct filtration plants. Where it is allowed, EPA should take a look at the variability and hydraulic loading. The group recommended that EPA not specify a particular recycle return location. EPA plans to say that the recycle location has to be at the head of the plant or before the treatment train (either simultaneously with rapid mix or somewhere before). EPA plans to give the states discretion in this matter, although it will provide guidance for the states on how to make these kind of judgments. The regulatory presumption is that the recycle flow goes to the head of the plant unless the state steps in and makes an independent decision based upon the facts and the design of the plant that an alternative location is appropriate.

IV. Council Discussion and Questions

- In response to a question from a member, Mr. Osinski described the Truth in Regulating Act that will require the GAO to review the cost-benefit analyses done for every proposal for significant rules or rules having a significant impact on a certain sector of the economy, generally around \$100 million. The GAO has 180 days for review.
- Mr. King clarified the issue of publication of comments on a proposed rule for a member. In general, summaries of comments are not published, however, EPA will send a list of commentators, the comments themselves, any analysis of the comments, and EPA's response to those comments

V. Risk-Based Regulation of Non-Community for Arsenic and Radon-Mr. Ben Smith

- EPA must make a decision as to whether they are going to extend the regulation for arsenic and others to non-transient/non-community drinking water systems.
- In the past, EPA has assumed that persons getting water from non-transient/non-community water systems drank half their daily water for 270 days of the year and 70 years at a single system. For transient systems, EPA assumed (for acute exposures only) that an individual consumes half their daily water 10 days per year and for 70 years at a single system.
- There are some technical issues wrong with the previous assumptions. EPA did a survey of the non-community water systems in SDWIS, to correct errors, and to take a close look at ownership of systems.
- EPA also looked at the radon RIA to examine what the indoor air exposures for radon might contribute to the overall scheme.
- EPA determined that there are about 38 categories of non-community water systems. With the proper computer tools, EPA now has the ability to do a risk analysis of these categories.
- The SDWA Amendments required EPA to consider a cost-benefit analysis as the basis for decision-making, and introduced policy issues. In the area of new constituents, EPA will look to see if the regulation offers a meaningful opportunity for health risk reduction.
- Doing a cost-benefit analysis for arsenic, for example, where exposure in non-community systems is assumed to be an order of magnitude less than that for community systems; reducing the arsenic standard from 50 to 5, one order of magnitude down, will not provide the expected benefits, however, the costs will still be there.
- In a non-residential case, if you have a factory, there is the option of offering bottled water. There are alternatives for limited use drinking water systems.
- From a policy perspective, with several regulations coming together, is involving non-transient/non-community systems the best use of limited state resources? In addition, is there a logical reason for dealing with transients separate from non-transients? Should EPA really be thinking about regulation of all non-community systems, no matter the size?
- For the new approach, EPA developed models to look at the type of institution and figure out the population. What EPA found, looking at both non-transients and transients in a very conservative analysis, is that there are a lot more people exposed than previously assumed, but at much lower levels.
- Based upon a second refinement of the human exposure scenarios, EPA suggested that all non-transients/non-community systems monitor, example for arsenic, and systems exceeding the MCL would just provide public notification. This notification would inform consumers that water from this source has a higher level than would be allowed in a community setting. Where there is no chronic exposure, EPA would not require monitoring for these contaminants.
- For radionuclides, EPA suggested in the NODA a number of ways to deal with these contaminants. These methods included:
 - - Monitoring required for non-transients only where community systems are experiencing high levels of contamination;
 - Systems above the MCL could provide reporting or be required to come into compliance;
 - Issue guidance that would recommend compliance and monitoring;
 - No coverage at all; and
 - Defer action until all technical uncertainties and policy issues are resolved.

- Commentators on the radionuclides NODA included both supporters and opponents. Addressing and managing public reaction is a very big issue.
- Concerning the comment that addressing extreme cases, for example, one unregulated system with arsenic at 900: when does something become an issue of national concern which should involve a drinking water standard being applied? These type of comments are related to policy issues and go beyond the scope of the regulations applicable now. How should EPA deal with these type of regulatory determinations?
- On the scientific side, there is the question of how far the analysis can be pushed given the unknowns about distribution and the overlap among sources.
- Concerning the risk communication issue; if EPA requires monitoring and reporting, how are results communicated to the public?

VI. Council Discussion and Questions

- The 1998 Stage 1 Disinfection By-Product Rule does apply to all systems whether they are community water systems, or non-transient public water systems, or non-community water systems. MCLs for chronic contaminants have been applied to these systems. In this instance however, EPA is struggling with whether or not to apply MCLs to these additional contaminants. There is a consistency issue involved here as well.
- To clarify, Mr. Smith noted that the above discussion referred to chronic exposures; acute exposures will be treated the same regardless. EPA hasn't considered at all how to deal with short-term exposures that could potentially have impacts on developmental issues (for example, children in schools).
- On the issue of susceptibility, there is an age variation in the case of radionuclides, in addition to the difference in consumption and the difference in body weight. In cases where EPA has age-specific data that would give a different risk profile, the modeling would be done using that information. A member suggested that EPA consider the issue of differential susceptibilities across all populations.
- A member suggested that EPA use DAILYs (Disability-Adjusted Life Years) in their analyses. EPA responded that the Office of Policy Analysis is assessing this issue (or "quality-adjusted life years") in their overall look at the Agency's Guidelines for Risk Assessment. EPA's position is that it does not support quality-adjusted life years in terms calculating benefits from its regulations. EPA prefers to evaluate "willingness to pay." This refers to what people across the country are willing to pay to extend or improve the quality of their life (including the elderly-a sensitive subpopulation). The SAB indicated to EPA that they should use willingness to pay rather than quality-adjusted life years.
- A member summarized by saying that the consequences of ingestion of a contaminant are different depending upon age, and it is not simply differential susceptibility. It is the length of time that a person would suffer the consequences. A more conservative approach would be to say that the younger ones have a bigger impact than the older ones.
- A member also suggested that these issues be looked at in terms of population-based risk (rather than individual-based risk as previously discussed).
- A member stated that EPA is misapplying the standard if it is trying to take a lifetime risk-based exposure estimate and apply that as an event-based risk model. A better approach would be to go where there is the most "bang for the buck." For example, prevent bacterial infections or nitrate exceedences, etc., that cause a public health concern.
- In response to a question from a member, EPA explained that they use data developed by the Office of Science and Technology, and reviewed by the SAB. Actual distribution of water consumption patterns and total water consumption were used. This was the most conservative approach. This represents what people actually drink in terms of water versus other beverages.
- The difference in regulation of non-transient/non-community water systems versus transient (non-regulated under this framework, the focus here is on acute risk issues) was stressed. This framework does not include even short-term exposures; just some chronic issues.
- The members conducted a lengthy discussion of the risk communication issue among others, including the following:

- - "Duty to warn" in risk communication;
 - State committees on source water protection do not provide rigorous enough review;
 - Appropriate use of resources;
 - Rural areas with "transient" sources may actually serve a residential population;
 - Risk avoidance and transfer of cost from the system to the individual;
 - Cumulative exposures; and
 - Careful consideration of sensitive subpopulations.

VII. Presentation to Departing Members

- Appreciation was expressed to the four Council members whose terms had expired and plaques given. The four members were: Dr. William Bellamy, Mr. Richard Coombe, Dr. Jeffrey Griffiths, and Dr. David Spath.

VIII. Update on Research-Dr. Fred Hauchman

- The EPA Drinking Water Research Program has a strong and stable budget, with a marginal increase in the number of researchers. In coordination with the NDWAC Working Group on Research, there will be an opportunity to see products and discuss some of the work. Dr. Hauchman presented the following information concerning projects of the EPA Drinking Water Research Program:
 - - Outline of the Comprehensive Drinking Water Strategy is completed;
 - A multi-year internal research plan for drinking water is under development;
 - An improved tracking system within the Office of Research and Development is under development;
 - The CCL Research Plan has recently been reviewed by the SAB and revisions are being made to the Draft;
 - The CCL Implementation Work Group will decide priorities for research and needs; and
 - Some products are being produced through the Drinking Water Grants Program.
- Dr. Hauchman described some activities concerning antibiotics in drinking water in response to a question from a member. This issue will be a component of the drinking water strategy. Please refer to the October issue of Environmental Health Perspectives: "Drugged Drinking Water," or C. Dalton's (ORD) detailed paper on the issue. It is important to consider that the public is getting more and more informed on this and other related issues.

IX. Overview of Drinking Water Epidemiology Program-Dr. Rebecca Calderon

- The Human Studies Division includes not only Epidemiology, but Clinical Studies, Biomarker Validation, and Human Pharmacokinetics as well.
- The Epidemiology Program is an intramural research, investigator-initiated program. The Program covers:
 - Drinking Water;
 - Air Pollution;
 - Pesticides; and
 - Multidisciplinary Studies.
- The Drinking Water Program covers the following:
 - Arsenic;
 - Disinfection By-Products;
 - CCL chemical work, primarily pharmacokinetics;
 - MTBE; and
 - Microbes.

- The Microbial Program is engaged with the CDC in waterborne disease outbreak surveillance. It also involves organism-specific work utilizing serosurveys, the CCL organisms, and infectious dose studies. The Program also includes work to measure endemic gastrointestinal illness, particularly relating to drinking water as a source of the organisms.
- The outbreak surveillance work relies a lot on networking. About a third of the outbreaks reported to the Program are a result of networking with state and local health officials. A substantial number of outbreaks are of unknown etiology. The big question: As new etiologies are discovered or better diagnosing of etiologic agents occurs, what will happen with the unknown fraction of outbreaks?
- The trend has been for more outbreaks associated with non-community systems. EPA is particularly interested in what deficiencies cause outbreaks to occur. Early on in surveillance, a noticeable fraction of outbreaks were related to untreated surface discharges. This is anticipated to go down with as these systems are regulated out of existence. Distribution system deficiencies have been increasing, possibly due to aging infrastructure.
- Endemic gastrointestinal disease is of typically unknown etiology. The Program is involved in endemic gastrointestinal illness work. The Program decided to use a community intervention study design rather than a household intervention study in assessing waterborne related endemic disease.
- Following the 1989 Surface Water Treatment Rule, with a concomitant increase in the pool of supplies making major changes, the Program determined the "enteric disease rate" (measured by symptomatology) in a community before and after the changes. By doing this it was hoped that it would be possible to look at a relative source contribution of water, as well as study etiologic agents and traditional sources medical surveillance. Children were the target and most sensitive subpopulation in the study. In the longitudinal study, an 80 percent higher rate of GI illness was found before versus after filtration. The attributable risk of drinking water was 34 percent. The conclusion was that before filtration, drinking water was at a minimum supplying 34 percent of the enteric illness rate in this community. The highest rates were in children. There was a public health benefit associated with filtration. In the future, two additional sites will be studied and the study design will be improved.
- GI illness does have a seasonal fluctuation and it may actually have longer fluctuations associated with different periods in time. To study this phenomenon, a paired study design is necessary. The first large stool survey since the fifties will be accomplished as part of this study.
- EPA is participating in an interagency initiative to establish birth cohorts. There will be a major emphasis on reproductive effects. A focus will be on cumulative and recurrent exposures, and endpoints of reproductive asthma, growth and development, infectious disease, and neurobehavioral. Drinking water exposures are being considered, especially disinfection by-products and microbial exposures. EPA is hoping to identify some risk management and prevention strategies, as well.

X. Council Discussion and Questions

- The issue of travel to another community or across a border and effects on the study was raised by a member. The study does ask about travel on a daily basis.
- A member suggested that by looking at disinfection residuals, it might be possible to shed light on outbreaks related to distribution system deficiencies and relationships to disinfection.
- In response to a question by a member, Dr. Calderon explained that the Program does not do any work on ribotyping or RNA in terms of *Cryptosporidium* or *E. coli* but does use a serology measure to look at antibody in individuals.
- A member noted how important it is to note that the typical techniques to identify outbreaks may not work where the longitudinal study described was able to identify outbreaks.
- A member reflected that there is good information that riverain sources, at least for *Cryptosporidium*, are more likely to be contaminated at higher levels, than standing bodies that are reservoirs.
- A member noted the existence of an epidemiological study in Vancouver, British Columbia correlating turbidity with an increase in disease rates.

- Dr. Calderon, in response to a question from a member, explained that sanitary surveys were also conducted as part of the study, both before and after. The utilities are also closely assessed.
- In addition to parasitic agents, the Program is also looking at some of the viral agents, for example, Hepatitis A. In addition, in the Seattle Study, there is a focus on some of the CCL organisms such as non-tuberculosis mycobacterium, heliobacter, and aeromonas.
- An issue to resolve, as brought up by a member, is how to relate an outbreak, for example, shigella, to water, and not some food or other source? EPA is working on this issue.
- The group felt that it is important to consider more multi-agency research efforts.
- Dr. Hauchman pointed out that the EPA Drinking Water Research Program is required under the SDWA to develop a national estimate of waterborne disease, sometime in 2002.

XI. Report of Research Working Group-Dr. Fred Hauchman

- The first meeting of the Research Working Group will be held at the end of November, 2000. The Group will review the Outline of the Comprehensive Drinking Water Strategy that EPA is developing. An important objective is to get feedback from the very beginning of the process. A list of invited members of the Working Group was available to members of NDWAC.
- The Strategy is divided into an evaluation of research to support the existing rules (MDBP, arsenic, and the regulatory requirement to do six-year reviews of the MPDWRs) and research on the unregulated contaminants (CCLs).
- Some topics of importance include:
 - Sensitive subpopulations;
 - Water quality;
 - Water quantity;
 - Pharmaceutical issue; and
 - Public health benefits of risk management actions.
- A scientific framework will be used to organize the discussions of needs for each of the topic areas.

XII. Council Discussion and Questions

- A member asked how can source waters be assessed to identify opportunities for protection and what are the most effective approaches? A fast, cheap, easy method for testing for viable oocysts is needed. The member urges the Working Group to consider methods for testing and validating BMPs for source water protection. Dr. Haughman responded that the Working Group will eventually go back to each of these scientific questions and ask: What do we need to know about source water protection and management?
- A member inquired as to how Chapter 4, unregulated contaminants, fits into the research strategy that is being prepared for SAB review? Dr. Haughman replied that the Group is grappling with this right now. Contaminant-specific research needs will not be provided in this document. A description of the approach being used will be included. There is a two-phased research approach, screening and more detailed. The research plan will likely point to what will probably be other types of reports that come out of the Implementation Work Group.

XIII. Update on EPA's New Cancer Risk Guidelines-Mr. Jim Cogliano

- The history of the new Cancer Risk Guidelines involves the following:
 - Proposed Guidelines published in the Federal Register in April of 1996;
 - Federal Register Notice two months later discussing how EPA would reevaluate cancer risk assessments that had been done in the past under the new Guidelines;
 - Review of new Guidelines by SAB and in 1997 the issuance of SAB advice to EPA;
 - Second Draft Guidelines came out in July 1999; and
 - SAB review received by EPA in September, 2000 focusing on children's risk issues.

- The main point to remember in how the new guidelines differ from the old is that the new guidelines are really developed so that mode of action data is used. Mode of action refers to how the chemicals cause cancer, which allows EPA to ask additional questions such as:
 - Relevance of laboratory animal experiments to human environmental exposures;
 - Whether the animals are predictive of humans; and
 - Whether the high doses in laboratories are predictive of what is going to happen at presumably lower doses that people are exposed to in the environment?

Mode of action allows other things as well. When how a chemical operates is understood, it is possible to start to identify what are the risk factors that would make a chemical more likely to cause cancer under some circumstances and less likely under other circumstances, which gives a key to trying to identify sensitive populations.

- Another focus of the new Guidelines is to provide different ways of extrapolating risk - whether risk is likely to be linear or proportional at low doses. Mode of action provides a key piece of information as to what the shape of the dose-response curve is likely to be.
- Mode of action also allows for adjustment of risk estimates. If it is understood how the chemical is causing cancer in animals, we can try to quantify the relative differences between animals and humans, and so we can perhaps scale risks from animals to humans more effectively than in the past.
- Four areas of recent discussion (or controversy) are:
 - Weight of evidence descriptors;
 - How we know that we have enough information to understand mode of action;
 - How we are going to do nonlinear dose-response assessments; and
 - To expand the cancer guidelines to make sure that it addresses risks to children.
- Regarding weight of evidence descriptors, Mr. Cogliano explained that EPA wanted to get away from the former classification system that basically looked at the number of studies that were positive and into a classification system that allowed incorporation of mode of action data that is more flexible. Five descriptors are utilized.
- A framework was put together having nine steps to evaluate when there is enough information about a chemical's mode of action which include:
 - Describe what this mode of action is;
 - Specifically identify the key events;
 - Look at experimental evidence that identifies and supports that mode of action;
 - Look for dose-response relationships;
 - Look for temporal relationships;
 - Look for biological plausibility;
 - Look for other modes of action;
 - Look for other explanations for how that tumor could be developing and investigate; and
 - Show that other modes of action are not plausible or that the experimental data cannot be explained through other means.
- After the overall conclusion is drawn, then the human relevance is considered (what is the relevance to human environmental exposure including subpopulations, children, elderly, other?).
- The July 1999 SAB review questioned whether the new guidelines, as proposed, were really protective of children. Most of the data are developed in laboratory rats and mice that are exposed after they are physiologically mature, missing the developmental period. Most of epidemiologic studies come from worker populations, once again missing children or special populations not well enough to work. The question is whether the conservative principles incorporated in the risk assessments are adequate to cover cases where data isn't available. Most agree that the linear extrapolation used for default is sufficiently conservative.
- The premise is that mode of action is probably applicable to children or in-utero exposure, but sometimes it is important to look at how development might affect the rates of these processes. The population threshold or level at which cancer would be seen might be lower for children, but a single factor could not be applied in all cases. The SAB recommended a case-by-case basis analysis.

- The interim use of the proposed Guidelines will be applicable, in part or in whole, on a case-by-case basis for new assessments as data warrant. This would allow for experience in applying the new Guidelines and assessment of practical application of the Guidelines. EPA will continue to rely on existing assessments, but on an annual basis will ask the public for candidates for reassessment under the new Guidelines.

XIV. Council Discussion and Questions

- A member described how the issue of children's health was particularly frustrating in review of the new Guidelines because there are some circumstances where carcinogens, particularly genotoxic carcinogens, are involved that you would suspect children to be at somewhat higher risk. In investigating the mode of action for a carcinogen, frequently you get broad hints that you have a special concern in a developing fetus simply because the mode of actions that are involved in carcinogenesis, particularly non-genotoxic carcinogens, tend to be also important in developmental defects.
- A member stated that it is important to pay attention to differential effects based upon people's backgrounds, genetic makeups, etc. Mr. Cogliano explained that EPA sees "mode of action" fairly broadly, as opposed to "mechanism."
- A member brought up the issue of linear response versus step-off functions and what kind of slope factors EPA uses. The EPA Guidelines are not explicit on how they propose to do non-linear extrapolations and SAB would like additional guidance in this area. Members suggested that the process be as transparent as possible.
- In reference to drinking water contaminants, one member noted that there is a long way to go before these assessments can be applied. Another member noted the limitation of toxicological testing and the implication to this process.
- The six-year review of the contaminant list will look at how do we build on work that is going on to update the IRIS information related to particular chemicals.
- One member spoke regarding the framework for evaluating postulated modes of action. The member noted that the identification of key events was a critical issue; as was the strength and consistency and specificity of association; and consideration of other modes of action, ruling out significant contributions from other modes of action. Mr. Cogliano responded that the process does require a fairly high standard of testing and confidence in those results.
- One member noted the very political nature of the process and questioned when does a look at alternatives get introduced? Mr. Cogliano explained that a lot of these issues are out of the scope of what is defined as risk assessment and more into the field of risk management.

XV. Report of the Six-Year Review Working Group-Ms. Evelyn Washington/Dr. Tom Yohe

- The second task of the Working Group was to develop recommendations that the Working Group has developed on the protocol to use to review existing regulations. This is discussed today starting with Ms. Washington.
- The statutory requirement for the Six-Year Review under the SDWA requires EPA to look at each National Primary Drinking Water Regulation not less than every three years and review that regulation and revise it as appropriate. In that revision, each regulation shall maintain or provide for greater protection of the health of persons.
- The assumptions that were made by the Working Group were that the review of the information means an analysis of the data related to each of the technical areas that support the regulation and that new scientific information will be required to substantiate any revisions to a regulation, and for this first year cycle, that the review and revision wouldn't be completed within the six-year time frame, but that it would happen for future cycles under the six-year review. The other focus was that for the contaminants that the Working Group is looking at for this round, for six-year review, would be all of the regulations that were developed pre-1996.

- The over-arching criteria that the Working Group came up with was that after reviewing the supporting data on the regulations, the criteria for determining if a regulation needed to be revised was that it had to meet one of two tests:
 - The revision itself would present a meaningful opportunity to improve the level of public health protection; or
 - The revision of the regulation presents a potentially significant opportunity for cost savings while maintaining or improving the level of public health protection.

The relationship between the primary and secondary elements are that if nothing has triggered a potential change of the regulation under the primary element, the secondary element may never be tested because it may not be worth doing.

- For each of the elements in the steps in the criteria, specific procedures and analysis of data, description of data sources, and areas of additional research needs are spelled out in the document that the Working Group produced. Additional research needs are linked to the Comprehensive Drinking Water Research Strategy.
- In the first six-year cycle, EPA is going to do an Advance Notice of Proposed Rule-Making by August of 2001, where the regulations proposed to be revised are identified (based upon review of data according to the protocol), describe the protocol, describe specific findings, accept public comment, and then one year later, make final decisions on what regulations need to be revised and provide a schedule for when those revisions will take place.
- For future six-year cycles, the objective is to propose regulations and finalize those regulations before the six-year process is complete, banking on resources.
- Dr. Yohe explained that this process applies to existing regulations and contaminants that are already regulated in water. Provided for review by the members was a decision tree for every chemical that comes up for review including such questions as:

Test 1:

- Are new health effects data available or in process?
- If yes, are we going to look at analytical methods?
- If there is new health effects data, will it be ready in time for the six-year review cycle?
- If yes, does it suggest a possible MCLG change?
- If yes, estimate the analytical methods limits, determine if changes to best available technology are appropriate or possible, and reevaluate the existing occurrence and exposure data; and
- If the analytical methods are the limiting factor, identify future research needs.

Test 2:

- Is improved technology available or feasible?
- If no, then the limiting factor is treatment technology, and identify future research needs; and
- If yes, then redo the risk assessment with the reduced exposures.

Test 3:

- If the MCL was not limited by treatment capabilities, then, was it limited by cost/benefit considerations or economic considerations?
- If yes, have things changed so that the cost estimates might change?
- If yes, then go back to the exposure assessment; and
- Based on the number of public water supplies impacted and the population exposed, estimate cost and benefits of each potential MCL change.
- The decision tree leads to further questions such as:
 - Are there other potential regulatory revisions, yes or no?

- Are data sufficient to support rulemaking and determine that it will be no less protective of public health?
 - If yes, then a risk assessment can be done for all potential changes, including cost/benefit considerations and non-regulatory options as interim measures;
 - If the MCLG or the MCL changes were not recommended, then, revisions are not made during the cycle.
- The members conducted a lengthy discussion of decision tree/flow charts which included such topics as:
 - If there were need to go with a treatment technique versus an MCLG and is the risk management decision revisited?
 - Use of surrogate measures and impact on risk management decision; and
 - Discretionary question of what level of review for each chemical.
- Recommendations of the Working Group to the members for consideration included:
 - - During the first six-year cycle, EPA should revisit data on which previously regulated decisions were made, effectively identifying data gaps that need to be filled; and
 - In future six-year review cycles, assume that existing regulations are adequate, except where more current, reliable data are available;
 - For the second and subsequent review cycles, group regulated contaminants for review, in order to achieve some efficiencies in the review process;
 - EPA should rely on data available to the Agency in a time frame that allows the Agency sufficient time for the review process;
 - Identify areas where significant data gaps exist and initiate activities to fill those gaps for subsequent review rounds, requiring sound scientific methods to carry out a review leading to a revision;
 - EPA should apply the basic principles of risk management in order to make the most protective and cost-effective decisions possible;
 - The protocol should address chemical, radiological, and microbial regulations;
 - The protocol itself should undergo periodic review and should include a non-comprehensive listing of future research areas;
 - The protocol should include consideration of other regulatory revisions and other options to protect public health;
 - If EPA has significant new data, it should accelerate the review and revisions of National Primary Drinking Water Regulations;
 - Health effects data should not be more than 12 years old;
 - Benefit assessment should include consideration of special subpopulations, synergistic health effects, and effects of chemical degradation products;
 - The cost/benefit should evaluate each potential National Primary Drinking Water Regulation revision and EPA should check the validity of post-1996 cost/benefit assumptions;
 - The National Contaminant Occurrence database should be reinforced with data that support this program; and
 - EPA should consider non-regulatory programs to reduce introduction of contaminants to drinking water and increase compliance through education, voluntary actions in centers and integration programs.
- Stakeholder involvement in the peer review process will follow EPA procedures.
- A minority opinion on the six-year review was available for anyone interested and concerned three issues:
 - The Work Group was not given time to verify the language that the document reflects;
 - EPA misused its authority and resources to spend limited taxpayer money on extensive reviews designed to weaken public health protection; and
 - The document did not propose to review every six years, but at least once in every two six-year cycles. The proposal to review health effects every 12 years is double the time allowed under the SDWA. In addition, EPA has proposed that the health effects of pesticides be reviewed every 15 years according to the schedule imposed by FIFRA. EPA has also proposed to review the health effects of radiological contaminants through

the Office of Radiation and Indoor Air every 10 years. The minority opinion urges NDWAC to insist that EPA review health effects according to the SDWA six-year schedule.

- The Working Group came to a consensus regarding the new cancer guidelines that going back to regulations where there were no new data to apply the new risk assessment measures was not worth the effort, but that as new data were identified, the new guidelines should be applied to the new data as changes are made in the regulations.

NOTE: A Motion was made to recommend approval of the recommended protocol for review of existing National Drinking Water Regulations, and appendices. The Motion was seconded. The members were asked to craft a statement to accompany the recommendations regarding the protocol for review of existing National Primary Drinking Water Regulations.

XVI. Council Discussion and Recommendations

- A member brought up the issue of the no backsliding rule and how it applies to the contaminants list or MCLs if a contaminant were found to be non-carcinogenic, for example. Dr. Yohe explained that the protocol would allow for a revision if it is still protective of the public health. With new information, it would not be considered backsliding. Moving off an MCL may present a legal issue however.
- A member questioned whether or not a contaminant could be dropped from regulation altogether if, for example, a certain pesticide use was phased out. Dr. Yohe replied that that was why the Working Group provided for a periodic revisiting of the protocol to address issues that come up.
- A member was concerned about the review process and how it applied to children's health effects. The protocol will require a specific look at developmental and reproductive data, a needs assessment, and a review of earlier assessments.
- A member suggested that in the unusual cases where a less stringent regulation is being considered, EPA obtain an opinion and commentary on the issue to improve transparency. Dr. McMullen explained that the protocol is a screening process before the rulemaking and public comment takes place. The member prefers to have a recommendation in the protocol that explicitly provides for transparency in cases such as this, where there may be a public perception of backsliding.
- The members discussed the issue of roll-over reviews, impacts of independent activities such as IRIS, pesticides analyses, and future data availability. A member made the suggestion to move the protocol as a guideline, and then make a separate statement to EPA with regard to backsliding and review of the National Primary Drinking Water Standards.

XVII. Update on MDBP FACA-Mr. Ephraim King

- The microbial and disinfection by-products rules are worked side by side in a risk-risk tradeoff basis. The Federal Advisory Committee met for about 18 months with 21 members.
- The purpose of the Stage 2 negotiation, which builds on the 1998 Stage 1 negotiations, was to ask the question: Is there any new information in either the area of disinfection byproducts or microbial that was not considered in 1998, that would lead or should lead EPA to revise or go further than the Agency went in 1998?
- There was a substantial amount of occurrence data and treatment data from the Information Collection Rule in addition to:
 - The National Rural Water Association survey of small systems;
 - Supplementary surveys on small, medium, and large systems;
 - State performance data on filter performance;
 - The FACA focused on reproductive and developmental effects of disinfection by-products (area of uncertainty);
 - Epidemiologic and toxicologic studies;

- Hazard identification;
- The FACA also focused on Cryptosporidium;
- Occurrence data of microbial effects dropped but was offset by new data on infectivity which increased by an order of magnitude (eg. cryptosporidium) and areas of high concentrations; and
- New information on morbidity.
- The FACA came up with recommendations in a signed Agreement in Principle. Proposed Rules are expected in late 2001, with the final rule in May of 2002.
- The agreement is between EPA and the stakeholders that participated in the negotiations. The agreement was that there is complete or substantial consensus around a certain number of issues. EPA agreed, as a part of the group, to go forward and to propose those recommendations in a Federal Register Notice. EPA will then proceed based upon comments received on the Proposal. The group reached full consensus on Part A and substantial consensus on Part B (the development of national microbial water quality criteria under the CWA and proceeding forward with developing regulations or analysis on distribution systems). On Part B, the National Rural Water Association declined to join the consensus.
- Part A consisted of the following:
 - Stage 2 MCLs; and
 - A new LT2 treatment technique.
- Mr. King described the differences in monitoring requirements from the 1998 IESWTR, compliance schedules, requirements for small systems, unfiltered systems, revisiting of microbial risk assessments in certain watersheds, and the availability and technical feasibility of UV as a technology for inactivating Cryptosporidium.
- There was also an agreement that existing finished water reservoirs that are not covered either should be covered or the state must make a determination that there is an adequate hazard reduction plan in place for that system or some sort of ongoing monitoring program for the uncovered reservoir to assure that it is protected from a public health point of view.
- In Part B, most of the members of the Federal Advisory Committee recommended to EPA that the Agency develop under the CWA a water quality criterion for drinking water stream reaches, putting the question of other people's discharges of microbial concentrations into the stream.
- The Federal Advisory Committee also agreed that EPA should proceed with evaluating distribution system issues including cross-connection control.

XVIII. Council Discussion and Recommendations

- In response to a question from a member, Mr. King explained that a Stage 3 would come someday, but not soon. This would involve information on reproductive and short-term endpoints, and low-dose, long-term research for exposure to disinfection by-products.
- Mr. King characterized the issues the National Rural Water Association had with Part B concerning water quality criteria and distribution systems and impacts on policy positions.
- Mr. King also explained that the National Water Quality Criteria target the stream or river designated for drinking water use. One of the greatest challenges in doing this criteria would be to figure out what is the appropriate indicator or surrogate in a stream reach, and that is not something there is an answer to yet. In addition, a very high quality, cheap, and easy method is necessary for detection.
- Ms. Dougherty explained that, eventually, if EPA sets a national criteria, the states have a certain amount of time to adopt those criteria as part of the state's water quality standards program, and depending on the uses they have designated for the water, first, they have to judge whether or not the stream meets that use, and second, if it doesn't, they have to do a TMDL about how to meet that use.

XIX. Public Comment

- There were no public comments made.

THURSDAY, NOVEMBER 9, 2000

I. Source Water Protection Strategy-Mr. Bill Diamond

- Mr. Diamond pointed out that EPA has identified areas that need further work which include:
 - - A better understanding by all participants of what EPA is trying to accomplish;
 - Provide meaningful strategic measures used to emphasize priorities and assess progress and ultimately, success; and
 - Develop a good data and tracking system with reporting to the public.
- EPA has established a National Work Group that includes Headquarters and regional people, with drinking water and CWA representatives.
- EPA held a multi-day, early involvement meeting with state partners in June.
- EPA prepared a Draft Strategy Document.
- In September, EPA held a national stakeholder meeting.
- Currently, EPA is revising the Draft Strategic Plan and working with partners to promote consensus on future activities.
- Mr. Diamond discussed elements of the Source Water Protection Program and the need for involvement in the program by multiple disciplines and a broader stakeholder involvement. These needs will be addressed in subsequent drafts of the strategy document.
- EPA is also addressing the issue of how to measure progress and what this means in day-to-day activities. There are four critical question that must be addressed:
 - Where are we?
 - What are the threats and the nature and extent of the risk to source water?
 - What are the effective actions that are being taken by the responsible party? and
 - Are the actions making any difference?
- EPA is charging staff that the program should meet not just statutory goals, but the ultimate goal of public health reporting.
- The Strategy aims to be flexible to meet current and future demands in terms of programmatic questions not yet asked. The Strategy also aims to be simple and cheap with changes made incrementally and over time.

II. Council Discussion and Recommendations

- In response to a comment from a member, Mr. Diamond explained that in terms of the broader community including agricultural interests, EPA has some activities, but they are not the focus of the Program (although the resources may be there to be tapped). EPA is telling the local drinking water community has an obligation to participate at the local level.
- A member brought up the issue of precursors (e.g. as relate to disinfection by-products) and the possibility to work this issue into the TMDL process. Mr. Diamond responded that the TMDL process is related to water quality standards which in many cases are focused on chemicals and long-term toxic effects. It would be necessary to adopt water quality standards for the precursors. A case in point is discharge of disinfectants.
- One member lead a discussion on the data infrastructure where the bottom is the state rather than local level. This does not allow for capturing subpopulations. Therefore, data capture needs to be done at the local level. This applies to many programs within EPA. The driver in watershed protection will be having local, voluntary, incentive-based programs in partnership with governmental and other entities.
- One member addressed the wording of the report itself and suggested some specific changes in phrasing to add "meaningful" and "collaborative," for example.

- The members discussed specific personal examples of how source water protection occurs in regions they are familiar with.
- One member was concerned with the plausibility of the goal of serving the population by 2005. Mr. Diamond responded that EPA is wrestling with this issue.
- One member suggested that NDWAC be updated at a future meeting on the issue of problems with SDWIS and other databases.

NOTE: The Council moved, seconded, to express their appreciation to the Chair, Dr. McMullen, for his work benefitting the Council.

III. Wastewater Infrastructure Gap Analysis Approach-Mr. Steve Albee

- Mr. Albee noted that the bottom line is that capital spending is not adequate, new water and wastewater debt is flat in terms of new investment. The sustainability of the system is at risk. Affordability is a growing problem.
- In terms of the gap, Mr. Albee explained that he sees it in terms of the difference between projected annual spending and projected investment requirements, the difference between the two as you look out into the years is the gap.
- The gap is currently about \$6 billion a year, and is going to go to 20 by the year 2020. The same thing is true in the water industry.
- To examine where the money is going, big growth in water and wastewater in the last couple of decades has been in operation and maintenance to repair and maintain aging systems. In this country, about the same amount of money is spent on water as wastewater.
- What does everyone want? Mr. Albee suggested the following:
 - A healthy infrastructure;
 - Promote efficient urban growth;
 - Funds to build and rebuild systems;
 - Efficient use of existing capacity;
 - Integration of services;
 - Policy neutrality;
 - Pricing and risk management;
 - Leadership (Center for Excellence for water utility management);
 - Maximum utilization;
 - Ten-year financial commitment;
 - Broad license for innovation and change;
 - Optimal decision-making at different levels; and
 - Subsidization.
- Asset lives are long (generational) and services are major inputs to other industries.
- Regarding federal interests, the federal government spends a lot of money on infrastructure, fairly important in wastewater, not so in water. Capital spending peaked in about 1990 and has been declining since then.
- Infrastructure spending is up by 60% since 1970. Water spending has doubled. Wastewater spending has tripled. Water as a business is garnering much more of the investment demand on infrastructure dollars than it did 30 or 40 years ago. Water and wastewater drainage represent about 30 to 35 % of the total expenditures in a community on infrastructure.
- One issue to examine is affordability for a household. Interesting public policy issues arise. The difference in the constant dollar income of the bottom quarter, middle quarter, the three-quarter mark, versus the top quarter of the population. The bigger population centers have decreasing populations, but the infrastructure cost is the same. Therefore the infrastructure costs per person is going up.
- Another issue is water quality. There is a terrific record of beneficial progress in terms of water quality, but there is a huge challenge ahead. Basically, if everything is held constant, the growth in the economy and the growth in the population would generally present the type of increase to

the kind of loading observed in the 1970's. It will be a serious challenge to continue to make progress.

- The issue of needs always involves a dialog of how this is calculated. Mr. Albee described that his version of counting needs is different in this presentation for the gap analysis.
- The gap analysis looked at replacement, which in the future arena is a much bigger issue than it has been in the past. Documented needs were looked at as well as model needs.
- Money has four purposes:
 - To retire existing debt;
 - New debt service;
 - Pay as you go; and
 - Increased cost of operations and maintenance associated with what we currently have and what we are going to have in the future.
- Mr. Albee provided detailed case study information.
- The agenda for future decision-making involves a funding problem in terms of money, not just federal money, but state money, local money. The population needs to understand the economic value of these systems. This dialog is well underway in Washington and nationally. Trade agreements are starting to drive decision-making in the water and wastewater area in some countries. Other issues involve record of reform, amalgamations, new approaches to price regulation, centralized and decentralized service, cost savings, and strategic approach (increasing the investment and asset management). Fostering the process involved talking with thousands of groups.
- Mr. Albee stresses that this is a huge problem and also an issue of obligation to future generations.

IV. Council Discussion and Vote on Guidance Document

- The members had a lengthy discussion on Mr. Albee's presentation including regional and local examples including the following issues:
 - Impact and users fees;
 - Differences in development (e.g. sprawl);
 - Reserve accounts are gone;
 - The total cumulative municipal debt for infrastructure has doubled over the last 15 years;
 - Institutional barriers;
 - Tapping of fees for other uses;
 - Systems designed for worst case viewed as over-built;
 - Efficiency of municipal governments and how to overcome short-term offices with long-term management;
 - Communications problems between public works people and political people;
 - Moving water into a businesslike environment;
 - Movement between public and private in the industry;
 - Trusts;
 - Abandonment of systems; and
 - Complexity of the problem.
- The members were asked to review the proposed recommendation from NDWAC to EPA regarding the guidance for review of existing National Primary Drinking Water Regulations. The work "protocol" was replaced with "guidance." D
- An additional change regarded potential changes to MCLs where the paragraph was revised to read, "As a part of the Six-Year Review, EPA will consider MCL changes." The guidance will not discuss whether MCLs are going up or down, or indifferent, this discussion was just removed from the guidance. There were other minor changes in wording.

NOTE: There was a motion, seconded, that NDWAC recommends to EPA that they adopt the Working Group's document. The vote in favor was unanimous.

V. Next Meeting / Agenda

- The next meeting of the NDWAC will be held May 16, 17 and 18, 2001.
- The agenda will tentatively include:
 - Material from the Research Group;
 - Development of a subgroup that deals with data gaps;
 - Possible Working Group on Water Infrastructure;
 - Advice on specific regulations to be examined in the six-year review; and
 - Further issues regarding source water.

NOTE: The next meeting of the National Drinking Water Advisory Council will be held at the Camino Real Hotel, El Paso, Texas on May 15 -17, 2001..

- The second meeting will tentatively be the 7th, 8th , and 9th of November, 2001.

NOTE: The Council moved, seconded, to express their appreciation to Charlie for all her work for the Council and to wish her luck in future endeavors.

- The meeting adjourned at 12 :00 p.m.

I certify that, to the best of my knowledge,
the foregoing minutes are complete and
accurate.

_____/s/_____
L.D. McMullen, Chair, National Drinking
Water Advisory Council

_____/s/_____
Charlene E. Shaw, Designated Federal
Officer, National Drinking Water Advisory
Council