

**Meeting Minutes**  
**Texas Commission on Environmental Quality**  
**Nutrient Criteria Development Advisory Workgroup: June 20, 2011**

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Follow up information is presented in this document and denoted by "*Italics*". For more information please see the meeting presentation and handouts.

Location: Building F, Second Floor, Room 2210

Time: 9:30 am – 3:30 pm

### **9:30 a.m. Welcome and Workgroup Introductions**

- General welcome and introduction of Debbie Miller as moderator
- Call to order, initial welcome, introduction of Kelly Holligan, Water Quality Planning Division Director (Debbie M.)
- Welcoming remarks (Kelly Holligan)
- Introduction of Water Quality Standards Group staff and workgroup members (Debbie M.)
  - Jim Davenport (Jim D.)
  - Laurie Eng Fisher (Laurie F.)
  - Jason Godeaux (Jason G.)
  - Joe Martin (Joe M.)
  - Debbie Miller (Debbie M.)
- Went over facilities, general safety information, sign in, and list serve. (Debbie M.)

#### Morning Handouts:

Agenda, Water Quality Criteria for Nutrients: Overview of Status and Activities in Texas and U.S., Recent National Guidance and Policy Documents, Summary of Numeric Nutrient Criteria in Florida, and Numeric Nutrient Criteria Development in Other States

### **9:45 a.m. Purpose, Goals, and Operating Procedures of the Workgroup**

#### Workgroup process, presented by Debbie M.

- All attendees can participate in the discussions
- Handouts, draft options, and related information will be posted on the website before and after meetings.
- Communication will be primarily by email, but alternatives can be arranged.
- The TCEQ will accept written comments but will not respond in writing. Those comments are due within two weeks of the workgroup.

### Purpose and goals of this workgroup, presented by Laurie F.

Facilitated opportunity to provide input on potential options for numeric nutrient criteria (NNC) and provide open review and suggestions for general TCEQ analysis.

For this meeting:

- Explain current developments in numeric nutrient criteria development nationally.
- Provide overall update on status and plans for nutrient criteria in Texas
- Encouraged feedback and suggestions.

Question asked of the group: "Any initial suggestions or comments on goals and procedures of the workgroup?" No input was given by workgroup at this time.

### **10:00 a.m. Nutrient criteria development - national overview**

#### Information on EPA Guidance, presented by Laurie F.

In 1998 EPA mandated that all states promulgate numeric nutrient criteria by 2004. They later allowed states to develop their own plans and schedules. TCEQ's current plan is from 2006. EPA developed National Guidance Criteria starting around 2000. The guidance was separate for lakes, streams, and estuaries. Groupings were large, aggregate nutrient ecoregions based on historical data for total phosphorus and total nitrogen, and they represented the 25th percentile or the 75th for unimpacted sites.

#### Recent nutrient criteria guidance, referenced handout, presented by Laurie F.

- Nutrient Innovations Task Group (August 2009) Report "An Urgent Call to Action - Report of the State" reports findings and suggests next steps needed to better address nutrient pollution
- EPA Empirical Approaches for Nutrient Criteria Derivations – SAB Draft (August 2009)
- SAB review (April 2010) by the Ecological Processes and Effects Committee Review of Empirical Approaches Nutrient Criteria Guidance  
[http://yosemite.epa.gov/sab/sabproduct.nsf/0/E09317EC14CB3F2B85257713004BED5F/\\$File/EPA-SAB-10-006-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/0/E09317EC14CB3F2B85257713004BED5F/$File/EPA-SAB-10-006-unsigned.pdf), noted correction to the link on the handouts.
- EPA's using stressor-response relationships to derive NNC (November 2010)
- Nutrients in Estuaries (November 2010)

#### Recent developments in numeric nutrient criteria, presented Laurie F.

Information covered included:

1. EPA memo from May 2007 that encouraged states to speed up numeric nutrient criteria development.
2. Lawsuits over numeric nutrient criteria have been filed against the EPA over the lack of criteria in states, for example Florida, which we will be talking about more in a minute.
3. EPA Inspector General criticized slow adoption of nutrient criteria by states in August 2009.
4. EPA promulgated numeric nutrient criteria for Florida rivers & lakes in November 2010.

5. EPA letter (Tinka Hyde, Region 5) to Illinois in January 2011 required evaluation of individual wastewater permits to implement the state's narrative nutrient water quality standard.
6. EPA response letter to New England states affirmed numeric nutrient criteria must have total nitrogen and total phosphorus criteria in March 2011.
7. EPA memo (Nancy Stoner) Working in Partnership Memo from March 2011, which was also discussed in later slides.

All of these developments are outlined in the Water Quality Criteria for Nutrients: Overview of Status and Activities in Texas and U.S.

General information on recent developments in Florida, presented by Laurie F.

EPA was sued by Florida's Wildlife Federation (FWF) and others over lack of numeric nutrient criteria in Florida. As a result, in a 2009 Clean Water Act determination and settlement with the FWF, the EPA issued a consent decree to propose nutrient criteria for Florida waters by January 2010. The EPA published the final nutrient criteria for Florida's lakes and flowing waters in November 2010. The promulgated criteria come into effect in March 2012. The EPA "extended the effective date for the rule for 15 months to allow cities, towns, businesses and other stakeholders as well as the State of Florida a full opportunity to review the standards and develop flexible strategies for implementation." More information is available on EPA's Florida Rule Webpage. The EPA plans to propose numeric nutrient criteria for Florida's estuaries in November 2011 with the criteria scheduled for 2012. Presentation went over the Nutrient Criteria that was promulgated for Florida and recent developments with regards to counter lawsuits against EPA, Florida Departments of Environmental Protections Petition (FDEP) to EPA to withdrawal criteria in April 2011, and public meetings FDEP is holding to revise the nutrient criteria. Reference to [FDEPs nutrient webpages](#) was provided.

Recent countersuits have developed as a result of EPA's promulgation. Florida municipalities and utility districts, Florida Fertilizer and Agrichemical Association, and the Florida Agriculture Commissioner have all filed lawsuit against EPA. In addition, very recently the Florida Department of Environmental Protection has petitioned EPA for withdrawal of the rule and is holding public meetings regarding possible revisions. All of these developments are outlined in Summary of Numeric Nutrient Criteria in Florida handout.

Section Question posed to group, "Any events of note or comments on Florida?"

Discussion Florida Numeric Nutrient Criteria

1. A participant asked how are the Florida criteria applied. Laurie F. responded that she was unsure of ultimately how they will be applied in permitting since they are not going to be implemented until next year. A participant expressed an opinion that two years was not enough time for industry and waste water treatment plants to implement the changes. A participant stated their will likely be a compliance schedule on top of that before it will be implemented. Diane Evens, EPA Region 6, volunteered to provide more information after the meeting.
2. Workgroup participant asked if the impact to impairment was understood. Laurie F. referenced a handout and pointed out that the financial implications are difficult

to discern and directly compare because impacts are reported differently between agencies and the organizations reporting them. Workgroup participant further clarified that they wanted to know the percent of water bodies likely to be listed in Florida as a result of NNC. Several participants offered percentages that ranged from 35-90 percent, and another pointed out that there was no clear determination of the exact number because the implementation of the criteria is not yet defined.

### General information on other states numeric nutrient criteria, presented by Laurie F.

General information about numeric nutrient criteria in Alabama, Arizona, Minnesota, Oregon, and Wisconsin was presented. The summarized criteria information was from the Numeric Nutrient Criteria Development in Other States handout which was referenced during the discussion.

Section Question posed to group, "Any events of note or comments on criteria in other states?"

Discussion of numeric nutrient criteria in other states

1. Workgroup participant stated Wisconsin's total phosphorus criteria were not approved. Laurie F. expressed she thought that they were approved but under contention in the state legislature and she would research.

*Note: After the meeting, Diane Evans of EPA Region 6 confirmed via email that Wisconsin's Water Quality Standards NR 102.6 total phosphorus criteria are approved NR by EPA. Wisconsin adopted two regulations for nutrients in both the water quality standards and the Implementation Guidance in Chapter 217 (which is different than Texas Procedures to Implement the Water Quality Standards). EPA is still reviewing the Wisconsin Implementation Guidance regulation. In addition, neither regulation has been repealed by the state; however, the legislature is looking more closely at the Implementation regulation.*

*For more information visits [Wisconsin's Nutrient Water Quality Standards Webpages](#).*

2. Another workgroup participant asked about Region 6 states. Staff did not have specific information regarding each Region 6 state, but stated Louisiana did not currently have criteria, and in general most states were in the process. Most states with criteria were listed in the handout. Laurie F. reported New Mexico was working on criteria. Jim D. confirmed Oklahoma has chlorophyll *a* criteria on reservoirs.
3. A workgroup participant suggested looking into nutrient criteria in Kansas.
4. Participant asked if any states were using original EPA ecoregional nutrient criteria guidance. TCEQ staff replied not to their knowledge.
5. Workgroup participant asked if only Hawaii and Oregon have nutrient criteria for estuaries? TCEQ staff replied that they were to only states they were aware of at this time.
6. TCEQ staff pointed out that most states are all working diligently toward numeric nutrient criteria.

Discussion of nutrient criteria development issues and information about nutrient criteria in general, presented by Jim D.

Points of presentation on why nutrient criteria are difficult for states to develop included:

1. Lack of clear "use-based" thresholds
2. High variability between seasons and years
3. Responses to nutrients are highly variable, lack of consensus on how to derive criteria
4. Differences of opinion on whether to apply independent criteria or "weight-of-evidence" approach
5. Insufficiencies in historical monitoring data, although Texas has a lot of historical data.
6. Initial EPA guidance criteria were problematic – not necessarily applicable at state level, which is why most states are developing individual methodologies.
7. High concern about regulatory impacts

In general, nutrient monitoring and research are increasing. Potential approaches for numeric nutrient criteria are becoming better defined such as stressor-response evaluations and defining reference conditions.

Discussion of nutrient criteria in general

1. Workgroup participant asked if there has been successful use of the weight-of-evidence approach by a state for nutrient criteria. Laurie F. pointed out that Minnesota has a multiple parameter criteria in the form of an "or" situation. Workgroup participant mentioned Virginia's "man made lake" nutrient criteria for chlorophyll *a* (see *Numeric Nutrient Criteria in Other States handout*).
2. Workgroup participant mentioned that Science Advisory Board's review of EPA's Empirical Methods discusses what has to be considered with weight-of-evidence approach. Jim D. mentioned the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) letter regarding Florida which referred to weight-of-evidence. Workgroup participant asked if the letter was available, and Laurie F. responded that she was unable to find a link prior to the meeting. Workgroup members requested a link or PDF be made available. Workgroup participant indicated he was able to find the letter online.

*Note: Link to ASIWPCA letter regarding Florida*

<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OW-2009-0596-1371>. In addition, the ASIWPCA webpage has been updated with [ASIWPCA's current priorities with regards to nutrient program issues and position letters](#).

3. Workgroup participant mentioned that the National Association of Clean Water Agencies documents may be of interest for the group to follow up with.
4. Workgroup participant stated that with an extreme response to nutrients, generally the stressor (nutrient) doesn't show up in the water chemistry since it has been used up, and this comment resulted in a discussion that loading may be the way to examine nutrient criteria. Workgroup participant stated that compliance could not be assessed by concentration and that loading was what caused the problem. Jim D. noted potential usefulness of loading models.
5. Workgroup discussed that if models were used they would need to be set up correctly and defensibly. Laurie F. pointed out SPARROW model was of issue in original EPA Nutrient Criteria proposal for Florida and they had to add data into model.

6. Workgroup participant questioned whether stressor response was evaluated in reservoirs. Jim D. discussed ultimate use of chlorophyll *a* as a response variable.
7. The workgroup discussion moved to possible response variables for further work. Dissolved oxygen daily swings and the complicating effects of salinity were discussed with respect to estuaries. Workgroup participants expressed interest in dissolved oxygen swings (daily max – daily min) since it is an easily measured variable with substantial existing data. Workgroup participants also discussed algal communities as an important response variable. There was some discussion about United States Geological Survey's methods for quantitative algal assessment, importance of the daily rise and fall of dissolved oxygen, and the potentially substantial effect of variability in daily light intensities on dissolved oxygen curves.

### **10:30 A.M. to 10:45 A.M. Break**

### **10:45 A.M. Status of Nutrient Criteria in Texas**

#### TCEQ nutrient criteria development, presented by Jim D.

Provided history of activities:

- Submitted plans to EPA in 2001, 2006
- Reservoirs, then streams & estuaries
- Convened advisory workgroup
- Criteria developed separately for each reservoir based on historical conditions
- New permitting procedures for nutrients in the Implementation Procedures

#### Information on the reservoir nutrient criteria, presented by Jim D.

Description provided of reservoir options. Two options were originally proposed:

- Option 1: Chlorophyll *a* criteria, but attainment would also be based on screening values for total phosphorus and transparency- derived the same way as the chlorophyll *a* criteria. A reservoir would be considered impaired if the chlorophyll *a* criterion plus one of the screening criteria were exceeded
- Option 2: Stand-alone chlorophyll *a* criteria

After public comment, stand-alone chlorophyll *a* criteria were adopted in 2010 for 75 reservoirs.

For assessment, a minimum of 10 or more sampling dates is required from a main pool station or comparable station.

Question: Any questions or comments on 2010 nutrient criteria and procedures?

Question: Should TCEQ update the nutrient criteria development plan?

#### Discussion of Reservoir Criteria

1. Workgroup discussed reasons chlorophyll *a* criteria were not adopted for all originally proposed 93 reservoirs. Jim D. noted that border reservoirs were dropped from the list and some reservoirs had inexplicable trends and high variability in the chlorophyll *a* data that did not appear to be due to actual changes in the condition of the reservoirs. Jim D. also explained that originally the workgroup suggested developing criteria for as many reservoirs as possible.

2. Workgroup participant questioned if the main pool station would be used in permitting, and Jim D. referred to upcoming discussion. Another participant wanted to know if the data was only assessed at one point. Staff answer was that the listed site, or one comparable, would be used to assess the reservoir since that's how the criteria were developed. There was also discussion about the possibility of using or developing criteria for other areas of the reservoir and the difficulties of addressing gradients and variability at different sites within a reservoir.

*Note: Slides that were prepared but not originally shown in this presentation are available in posted presentation, per workgroup participant request.*

### Information on the 2010 Implementation Procedures with regards to nutrient evaluations, presented by Jim D.

Introduction of David Galindo, Team Leader, of Standards Implementation Team, Water Quality Division.

2010 Standards Implementation Procedures Information covered included:

- Applied to increases in domestic discharges
- Established framework for setting nutrient total phosphorus effluent limits where needed:
  - Apply site-specific screening factors
  - Determine level of concern for each factor – low, moderate, or high
  - Assess “weight-of-evidence”
- Reservoirs – predict effects on “main pool”
- Reservoirs – assess local impacts using a variety of factors
- Streams – assess local impacts: (as for reservoirs, but with different factors)

*Note: Slides not originally shown in presentation are available in posted presentation, per workgroup participant request.*

### Discussion on Implementation Procedures

1. Workgroup participant questioned if implementation analysis will apply in those reservoirs with chlorophyll *a* criteria. Jim D. explained that for those reservoirs with criteria, a simple completely mixed steady state model is used for the whole reservoir (like a “bathtub”). The potential increase in phosphorus and estimated effect on chlorophyll *a* is compared to the criteria to see if the discharge needs additional controls to preclude substantial increases. Discharges to reservoirs are also evaluated for localized impacts as previously described. Jim D. showed slides not originally slated for presentation with examples of using site-specific factors to assess localized impacts in reservoirs. The workgroup discussed the process of looking at local impacts. There was also additional discussion concerning how consistency with other permits in the area is used as one of the factors.
2. Workgroup participant questioned whether permittees have been receiving permit limits based on implementation procedures. David Galindo replied that the process has been in place for a while and incorporated. They have proposed limits for facilities and some have been issued limits.
3. Workgroup participant asked to what extent the procedures specified site-specific effluent criteria. TCEQ staff replied that the procedures were designed to generally determine if a limit for total phosphorus was needed, but then default effluent limits

were applied (based in part on size of the discharge). There was also a question about how the antidegradation policy was applied/conducted for nutrients, and staff responded that the nutrient implementation procedures were also considered to include an antidegradation review.

#### Presentation of EPA review of standards, presented by Jim D.

- Standards and Implementation Procedures adopted by TCEQ 6/30/2010
- Additional documentation sent to EPA 8/4/2010
- EPA comment letter on the Standards Implementation Procedures 12/2/10
- EPA request for more information regarding the nutrient criteria 5/17/2011

Jim D. explained EPA's general concerns regarding chlorophyll *a* criteria greater than 20 micrograms per liter, in addition to their request for additional statistical documentation. TCEQ staff is in the process of putting together the requested documentation to send to the EPA.

#### Discussion of EPA review

1. Workgroup participant questioned if the 5/17/2011 correspondence from EPA regarding nutrient criteria was available on website. Jim D. replied no, that it was only email correspondence.
2. Diane Evans from the EPA discussed that the scenic rivers in Oklahoma were the first in Region 6 to have nutrient criteria. The packet coming from Texas is the first "big" packet of nutrient criteria information they will receive; therefore, it could take some time to make strides in implementing the criteria.

#### EPA framework memo for state nutrient reductions, presented by Jim D.

General information presented:

- EPA Memo from Nancy Stoner on March 16, 2011
- Summarizes key elements needed for state programs to reduce nutrient loadings
  1. Prioritize watersheds on a statewide basis
  2. Set watershed load reduction goals
  3. Ensure effectiveness of point source permits
  4. Agricultural areas
  5. Storm water and septic systems
  6. Accountability and verification measures
  7. Annual public reporting of implementation activities & biannual reporting of load reductions
  8. Develop work plan/schedule for numeric criteria
- Intended as a flexible planning tool
- EPA region 6 has also requested comment and discussion with each state on the framework

Discussion on EPA framework

1. Workgroup participant questioned how nonpoint sources are addressed, and that prompted a general discussion of watershed protection plans and the total maximum daily load (TMDL) process. Workgroup participant provided example of watershed protection plan of Lake Granbury. A workgroup participant suggested framework could result in TMDLs for every watershed and wondered how a nutrient reduction

target could be set without a criteria target. There was additional discussion on the potential use of a broad nutrient management scheme. Workgroup participant asked which of the eight points has priority. There was no clear priority, but progress on numeric nutrient criteria was suggested as important. A workgroup discussion followed about the memo being an interim process; however, some participants were still concerned that goals for reduction would be difficult without target.

2. Workgroup participant questioned if chlorophyll *a* criteria are approved is the 8 step process outlined in the memo still necessary. The extent to which adoption of criteria might affect this process is unclear at this time.
3. Workgroup participant mentioned that Kansas has framework of nutrient reduction with an overall big picture plan. Laurie F. mentioned some states have developed Nutrient Reduction Strategy Plans; for example, some states that contribute to the Mississippi River have developed strategies to reduce inputs into the Mississippi River.
4. Workgroup participant wanted to know how many watersheds would be affected if a statewide assessment of nutrients were conducted for 8 digit hydrologic unit codes. TCEQ staff said that the number of 8 digit watersheds all or partly in Texas appeared to be about 210.
5. Workgroup participant wanted to know if there were plans to incorporate the suggestions of the memo ("8 step method") into standards. Jim D. indicated that for streams the plan is to develop implementation procedures in close coordination with nutrient criteria.
6. One workgroup participant stated that there is currently no clear mechanism for prioritizing water bodies or quantifying targets, but that some parts of EPA's framework might work. Another participant stated that the lack of quantified targets, lack of effects-based considerations, and other concerns created too many problems to utilize the framework as presented.

### **Lunch Break 11:30 A.M. to 1:00 P.M.**

### **1:00 Prospects for Developing Additional Nutrient Criteria for Texas**

Afternoon Handouts: Selected Nutrient Projects and Related Projects in Texas, Summary of Nutrient Data from Surface Water Quality Monitoring Information System, Estuary Summary Statistics and Analysis, Corpus Christi Bay Segment 2481 Station 13407 Example, Upper Galveston 2421 Station 13305 Example, and Laguna Madre 2491 Station 13446 Example.

#### Overview of prospects and current plans, presented by Jim D.

- Procedural options to develop criteria are better defined nationally
- Substantial data available for Texas
- TCEQ staff have consolidated nutrient-related data for streams and rivers, and for estuaries
- Assessment is being conducted of available Texas data and options being explored by other states
- Evaluation of responses to nutrients in Texas streams and rivers using historical data is ongoing
- TCEQ intends to develop criteria option for selected rivers and estuaries based on historical conditions:

- Individual water bodies
- Reference groupings
- Additional options to develop include evaluations of stress/response relationships in both rivers and estuaries.
- Weight-of-evidence approaches will also be considered as part of these options

#### Discussion of proposals and current plans

1. Workgroup participant expressed that criteria, once approved and implemented, should not artificially list too many water bodies as impaired.
2. Workgroup participant noted that due to complexity of estuaries grouping may not be a logical option. Jim D. pointed out that in Florida they considered at one time establishing separate workgroups for each estuary complex.
3. Jim D. asked workgroup if we needed to update the 2006 Nutrient Criteria Development Plan. Workgroup member wanted to know if the plan is on schedule at this point. Jim D. indicated that criteria are still roughly on track with the 2006 plan and the workgroup can consider this question at later meetings.
4. TCEQ staff discussed timeline of 2013 standards revision. Debbie M. announced Water Quality Standards Workgroup meetings are tentatively scheduled for spring of 2012 and that there will be 3 meetings approximately 1.5 months apart.
5. Workgroup participant questioned how instream flow will be addressed in criteria. Another participant pointed out issues with stream flow dominated by discharge. General concern was expressed over difficulty of addressing effluent dominated streams.

#### Available data discussion, presented by Laurie F.

##### Streams and Rivers

For streams and rivers there is 30-40 years of data at 100s of stations for variables such as total phosphorus, nitrogen parameters, 24 hour dissolved oxygen, and fish and benthic invertebrate sampling. However, the dataset lacks periphyton sampling data or benthic chlorophyll *a*. Recent and ongoing stream studies with low-level nutrients and measures of attached algae will assist with that data gap; see the Current Nutrient Projects and Related Projects in Texas Handout. Examples of projects include: Texas Nutrient Data Collections Project, USGS hill country and east Texas studies, and Texas Parks and Wildlife Department small stream studies. The response variables and their relation to nutrients are not clearly understood and further investigation will be needed.

*Note: A workgroup participant requested a link to TPWD small stream studies:*

[http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_bk\\_v3400\\_1216.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_v3400_1216.pdf).

##### Available Data for Estuaries

There are long-term monitoring stations with decades of data for parameters of interest and numerous research studies on estuaries. There are still research and data needs, which include the need for more nitrogen data, lower detection limits, understanding of relationship of nutrients and productivity, development of biological indices, understanding of nutrient effects on biological indices, and understanding effects of variations in salinity. Examples of research studies were provided, see the Current Nutrient Projects and Related Projects in Texas Handout.

## Available Data for Reservoirs

There are long-term monitoring stations with decades of data for parameters of interest. There are also still research and data needs for these water bodies, which include the need for more nitrogen data, lower detection limits, understanding of relationship of nutrients and productivity, development of biological indices, and understanding of nutrient effects on biological indices.

## Discussion of available data

1. Workgroup participant asked how the available nitrate data was for streams and rivers, and if it could be used for criteria. Laurie F. pointed out that it would be preferred to have total Kjeldahl nitrogen measure along with nitrate and nitrite or at least total Kjeldahl nitrogen plus nitrate, total nitrogen can still be calculated.
2. Workgroup participant asked what gets sacrificed with attempts to achieve lower detection limits for total nitrogen and expressed concern over current constraints. Workgroup member also expressed that there needs to be cooperation with Surface Water Quality Monitoring, Clean Rivers Program, National Environmental Laboratory Accreditation Conference, and Standards.
3. Dr. Buskey's project looking at nutrients and criteria development in Mission-Aransas was discussed. Workgroup participant expressed concern that looking at chlorophyll *a* in water column was an easy "out" and that understanding relationships with response variables other than phytoplankton in estuaries was required. Dr. Buskey's project method, which integrates total community approach, was discussed.
4. Jim D. pointed out that at this time there is not a plan for incorporating other species and that biological indices would be useful. Workgroup discussed importance of biological indices for invertebrates and fish in estuaries. Current efforts toward biological indices by TPWD, TCEQ (Dr. Linda Broach), and GOMA were discussed.
5. Workgroup participant asked how we will address tidal streams. Jim D. stated that those are not included in current development efforts, and we will probably need to address them as a separate category.
6. Workgroup participant pointed out importance of sediment sampling and provided as an example the special study by Brazos River Authority and TIAER that is looking at nutrient in Lake Somerville. The study has shown that phosphorus is associated with iron, aluminum, or calcium and changes seasonally.
7. Workgroup participant wanted to know how we will reconcile historical data and newer data with issues such as multiple reporting limits and changes in the method.
8. Workgroup participant wanted to know if we will be looking at nutrient loading through its biological response. Laurie F. indicated that we have not done so at this time. Workgroup discussed studies that have looked at monitoring seagrassing with nutrient loading.
9. Workgroup participant expressed concerns about loading models. There was concern for public education and how "good" a model can be in explaining nutrient loading.

## Discussion of the road ahead for streams and rivers, presented by Debbie M.

Topic provided to encourage discussion included categorization and options. Requested input from group on the options and opened discussion on challenges, which include how to address effluent dominated streams.

1. Workgroup participant expressed concern that consideration for streams that are fed by aquifers, like the Edwards Aquifer, may need to be treated differently. Often

times they have elevated nitrogen based on natural conditions. TCEQ staff agreed that considerations for natural differences between streams will need to be considered.

2. Workgroup participant wanted to know what happens when you have obviously nutrient impacted water bodies, i.e., such that they are already have a screening concern or are showing obvious response. Concho and Leon River were used by participants as examples, pointing out they have extremely high nitrate levels. Laurie F. asked if total Kjeldahl nitrogen was also being measured and what the ratio between the TKN and nitrate were. If you calculated total nitrogen, it may provide interesting information.
3. Workgroup participants discussed option that total nitrogen and total phosphorus should be looked at on a site-specific basis, at least by watershed, to see if both are actually required. WQS staff questioned how you could look at it site-specific levels if the parameters are not being monitored.
4. Workgroup participant wanted to know if effluent input would be looked at on a case by case basis and pointed out many streams are effluent dominated. Workgroup member suggested a possible reevaluation of uses for effluent dominated streams. Workgroup participant pointed out example where San Antonio is pumping water (some effluent) to above the headwaters to get flow for Salado Creek. If it was not for farmer demand there would be no flow. Workgroup participant pointed out there would have to be a rationale for changing the use. Another participant suggested aquatic life use shouldn't apply since without water there would be no aquatic life. Workgroup participant expressed concern that creating a new use without protection of things like aquatic life is getting away from the Clean Water Act. Other effluent discussion points included the possibility of a tiered approach to defining uses for effluent dominated streams and suggested that a definition would need to be included in the standards of what was considered to be an effluent dominated stream.
5. Workgroup participant expressed that dissolved oxygen criteria should play a large role in nutrient criteria development in rivers and streams.
6. Workgroup had some discussion about qualitative periphyton sampling. Laurie F. indicated that the TCEQ was looking into qualitative sampling. Workgroup participant pointed out that they investigated qualitative methodologies for periphyton sampling in streams and have not had success and would suggest using quantitative methods for benthic chlorophyll *a*, i.e., rock scraping.
7. Workgroup discussed grouping schemes including grouping complexes like the hill country streams or groupings based on basins crossed with ecoregions.
8. Work group discussed how effluent dominated streams may affect larger water bodies and Florida's downstream protection value element of the rule. Workgroup participant wanted to know if TCEQ was looking into this, and staff's reply was with currently this is not being considered in criteria development; however, it is considered in permitting.
9. Workgroup participant wanted to know how interstate waters will be affected. Jim D. explained that other states have asked TCEQ to wait for them to catch up before setting criteria on shared water bodies.
10. Workgroup participant wanted to know how the 8 steps outlined in the EPA memo affect nutrient criteria development. Workgroup discussed the 8 steps presented in the memo.
11. Workgroup participant expressed that EPA was taking small citizens out of the picture, getting anything done required lots of money, and the result was big projects requiring modeling. Data collection for this level of effort will need to be funded.

## Break

### Discussion of the road ahead for estuaries, presented by Jason G.

Topic points provided to encourage discussion included categorization and criteria options. Requested input from group on the options and opened discussion on challenges such as what defines normal healthy nutrient loads, establishing reference stations, and examples of other criteria are lacking.

1. Workgroup participant expressed that nutrient gradients can be highly variable across estuaries; location plays a large role in turnover time.
2. Workgroup participant questioned if tidal sections would have different criteria to protect estuaries and suggested that may be complicated because they are variable. Participant pointed out that the tidal stream is important for identifying sources and points to consider in downstream protection. Setting an upstream standard doesn't always solve the problem of downstream protection. WQS staff expressed that this was a difficult aspect to address and pointed out Florida's struggle with this issue.
3. Workgroup participant asked if numeric nutrient criteria will address issues with the dead zone in the Gulf of Mexico at the mouth of the Brazos River. Jim D. answered that it may, but we do not have a specific way of addressing that issue. Workgroup participant pointed out nutrients and stratification of fresh water affects the dissolved oxygen, and low levels of stratification result in decreases in dead zone areas.
4. Workgroup discussion focused on weight-of-evidence approach and using multiple parameters for nutrient criteria modeling.
5. Workgroup participant wanted to know how this will be coordinated with Senate Bill 3 regarding instream flows. WQS staff replied that coordination with staff members and other agencies working on issues related to Senate Bill 3 will be needed while TCEQ develops NNC.
6. Workgroup participant commented that just 15 years ago there were not enough nutrients in Galveston Bay and the estuaries were having poor productivity. Discussion topic included TPWD studies showing nutrients are currently in high enough concentrations and intentional nutriecification to increase fisheries has occurred. Workgroup members asked if the current levels of nutrients should be maintained, or if these levels are decreased overtime will there still be adequate levels to support productivity. Workgroup participant stated that Galveston Bay does not appear to be in need of more nutrients at this time.

### **3:00 P.M. Conclusions**

#### TCEQ Next steps and action items

- Complete and post assessment of available data and other states' approaches.
- Complete and post preliminary stressor/response evaluation of rivers and streams.
- Further define and initiate estuary evaluations.
- Plan to reconvene workgroup in future to assess examples of criteria options. A date is not set at this time and may not be until early 2012.

Debbie M. made general closing announcements

1. Announced notice of preliminary comments in June 24, 2011 Texas Register.
2. Comments on workgroup meeting are due in two weeks.
3. TCEQ staff will notify the group and post studies online as they become available.
4. If new info comes up, send it to Laurie F. so the group can be updated.

### **3:30 P.M. Adjourn**