Assessment Methodology Stakeholder Workgroup
MEETING MINUTES
23 February 2017, 1:00pm-4:00pm
ADEQ Commission Room

Stakeholders present: Jim Malcom (AEF), Vince Blubaugh (AEF), Charles Miller (AEF), Stan Suel (AWWMA – Wastewater), Brian Thompson (BRWA), John Pennington (Beaver Watershed Alliance), Darcia Routh (ADH), Mike Armstrong (APPP), David Peterson (Ozark Society), Alice Andrews (Ozark Society), Melissa Lombardi (USFWS), Tate Wentz (ADEQ), John Bailey (Arkansas Farm Bureau), Ryan Benefield (ANRC), Jamie Ewing (Arkansas Attorney General's Office), Bob Allen (Arkansas Canoe Club), Shawn Hodges (NPS), Sarah Clem (ADEQ), Mary Barnett (ADEQ), Bob Morgan (Beaver Water District), Colene Gaston (Beaver Water District, by phone), Selena Medrano (EPA, by phone)

1:05 – 1:10 Welcome and Introduction

1:10 – 1:50 Discussion of Assessment Methodology Sections

MARY BARNETT: Commented that the first item on agenda was the one meter depth language. Referenced an email sent to the workgroup which included documents addressing today's agenda items. Copies of the documents were made available to those needing them for reference. For lakes, there were several places where the standard mentioned that assessments would be done at one meter depth. EPA took no action on that language. Example of how ADEQ is addressing that in handout. We took out the language "one meter depth" and will replace with "the epilimnion".
BRIAN THOMPSON: Stated that he is sitting in for Teresa Turk. The language "epilimnion" is less specific than "one meter depth". So, my question is, "Why would we become less specific"? That would seem weakening.
MARY BARNETT: Responded that in our public listening session, several concerns were expressed that the language "one meter depth" was too limiting; that aquatic life exists in more of the water column than what is just at one meter depth. The language "epilimnion" will allow for assessment of a broader range of data.
BOB MORGAN: Asked about the Beaver Lake criteria, in data quality considerations, you say "no greater than one meter" for chlorophyll, but in the listing you say "in the epilimnion"…
MARY BARNETT: Asked if Bob Morgan was talking about the Beaver criteria?
BOB MORGAN: Replied, "Yes".
MARY BARNETT: Responded we are going to talk about that in a few minutes.
SELENA MEDRANO: Asked how are you going to define epilimnion? Because that changes. Are you going to determine it while you're on the lake, at each lake, each time you sample it? Because that seems a little limiting, in terms of time.
MARY BARNETT: Responded that there is a definition of epilimnion at the top of the page on the handout. The epilimnion is defined as the uppermost stratified layer.
SELENA MEDRANO: Responded that is correct, but that changes. What happens if you have a mixed lake?

MARY BARNETT: Commented that we have looked into this, and in the case of a mixed lake, that is a scenario where the epilimnion could be the entire waterbody. And, the way we currently sample, we take a depth profile, so we are able to determine where the epilimnion is.
SELENA MEDRANO: Asked, so you're going to do that post-sampling, you're going to do that in the analytical portion?
MARY BARNETT: Replied, "Yes".
TATE WENTZ: Commented that we identify the thermocline on the lake while we are there. During the depth profile, we determine where the epilimnion is onsite.
MARY BARNETT: Replied that we could also do that on the analytical side if we receive data…
TATE WENTZ: Commented that during assessments for calculating standard applicability, yes, that will occur post - while we're analyzing all the lake data for assessment purposes.
SELENA MEDRANO: Asked how do you determine where that change is? Half a degree? One degree change? What are you looking for?
TATE WENTZ: Replied it's usually paired dissolved oxygen and temperature data. Usually several degrees to several parts per million difference in the thermocline.
SELENA MEDRANO: Responded that basically she wants a definition of how ADEQ defines that area.
TATE WENTZ: Replied we will look into defining that.
SELENA MEDRANO: Replied, "Thanks".
RYAN BENEFIELD: Commented that he is worried because usually you want to keep a constant sampling point based on the standard, so this would move that? You are no longer limited to samples at one meter depth, you can take samples anywhere within the epilimnion? Is that consistent with how the standard is set?
MARY BARNETT: Responded we would be taking it anywhere within the epilimnion.
SELENA MEDRANO: Commented that throughout Region 6, most of the states have a specific depth defined.
SARAH CLEM: Responded that previously it was applicable at one meter depth, and then EPA said that "applicable at one meter depth" was not supported
SELENA MEDRANO: Asserted that the issue was the word "applicable".
SARAH CLEM: Responded okay, so you are saying other states in Region 6 actually have a number, give a depth. It was a wording issue.
SELENA MEDRANO: Replied, "Correct".
RYAN BENEFIELD: Commented that the standard is applicable at the entire lake, but the sample is measured at one meter depth. You just look at that one meter depth for assessment purposes – is what I think the goal is.
MARY BARNETT: Responded that we were trying to both address an EPA standards concern – which may not be an issue anymore – and we received comments from the public policy panel that limiting assessment to only data at one meter depth would limit the data we were able to assess. With us taking measures to develop assessment methodology for continuous data, the one meter depth would limit the ability to analyze the continuous data.
MIKE ARMSTRONG: Commented that he did not make that comment, but he thinks that comment was suggesting the epilimnion is a zone that mixes and would be uniform

throughout that zone; therefore, the thought was: Are you limiting other data sources that would be useful in that context. If you had 30 data points within the epilimnion, but you just use the one point at one meter depth; not sure if there is data out there that is not being evaluated based on it not occurring at one meter. That's the context behind the comment.

RYAN BENEFIELD: Responded, but if you had 30 data points taken on the same day, then you wouldn't count that as 30 different data points. That one day would skew everything else. That's why I think it would be appropriate to look at just the one at one meter depth – you're talking apples to apples amongst all your samples.

MIKE ARMSTRONG: Agreed that wasn't the greatest example. But, maybe there is someone out there that is taking samples at two meters or half a meter …. The whole point was the whole zone is represented from top of surface to bottom of mixing zone – any data within that zone is representative of the whole zone. That's the intent.

DARCIA ROUTH: Commented that for ADH, the issue is how representative is one meter of the whole epilimnion? We don't go out with you, so we don't know what else you do. That's the hesitation that we share.

JOHN PENNINGTON: Asked if it was practical to take a number of samples from the epilimnion and average those numbers?

TATE WENTZ: Replied that USGS takes a composite sample, we do a single grab sample. Yes, it can be done, but the Department takes a single sample.

JIM WISE: Commented that another reason we went with the epilimnion language is because AGFC lakes sometimes don't have a one meter epilimnion. In the delta, the epilimnion may only be six inches. If we sample at one meter depth, we may be sampling the hypolimnion, and all AGFC lakes would be listed as impaired.

MARY BARNETT: Stated we have captured that part of the group sees merit in the ` epilimnion language and part of the group has concerns and may prefer the single location. We can continue to ponder that.

JIM MALCOLM: Suggested that if people wanted to specify depth, and taking into account Jim Wise's comment, could it be something like mid-epilimnion depth? That way you are specifying a comparable zone to evaluate across time frame. Just a thought.

MARY BARNETT: Responded, "Thank you".

MARY BARNETT: Asked if there were any more questions regarding one meter depth. Moving on to 6.12 Ammonia: Comments from the listening session are on page 13. Early life stages of brown trout were present outside of the April 1 – October 31 date range. This date range is not in Reg 2. To keep the methodology consistent with Reg 2 and to be most protective, the date range will come out. It will be replaced with the language, "when early life stages are present". Any discussion?

SHAWN HODGES: Asked if there was any way to apply to early life stages of freshwater mussels as well.

SARAH CLEM: Replied the new criteria for ammonia include mussels; however, we have not adopted that criteria in to Reg 2. It can't be used because it has not been adopted.

MARY BARNETT: Commented that currently Reg 2 does say "fish early life stage", so right now we are limited to that.

BOB MORGAN: Asked how are you going to know when you go out if early life stage are present or not?

MARY BARNETT: Replied it is not necessary to have that type of sampling. We will look at the ammonia data and assess it according to the criteria in Reg 2 and based on the knowledge we have of fish breeding, we would apply it.
BOB MORGAN: Asked if you are then referring back to other data to see when fish are breeding.
SARACH CLEM: Replied, "Yes". It is normally a time of year.
STAN SUEL: Asked if that date range is stricken, how will that affect the permitting? Will it stay the same for permitting?
SARAH CLEM: Nodded head in affirmation.
STAN SUEL: Responded thank you.
RYAN BENEFIELD: Asked if you receive outside data, how will you determine whether or not to put it in or out based on this language? You said it's based on a time of year, but a time of year is what we had in the assessment – and we are going to throw that out. So how do you know when you receive data if that data is to be used, or not used?
MARY BARNETT: Responded there are criteria for ammonia when early life stages are present and when they are not present. In most situations we will use the typical breeding season, but now we are aware that brown trout is a different season, and those trout waters will be assessed differently on the early life stage present criteria.
RYAN BENEFIELD: Suggested you could change this to say for all fisheries other than brown trout use the April – October, but for the brown trout fisheries, you use whatever that season is.
SARAH CLEM: Commented the trout waters are identified in Reg 2.
RYAN BENEFIELD: Suggested you could say "trout waters" or instead of taking the time period out, you could just say for those two specific water bodies, this alternate time period applies.
SHAWN HODGES: Commented that for this year, we could see early life stages a lot earlier than April 1st. When you're sampling, this comes from the surface? Commented that early life stages of fish and mussels will be at the substrate level. I don't know how that can be sampled.
SARAH CLEM: Agreed with Shawn Hodges, but we have to consider sampling, getting to the lab, and is that a measurement of actual conditions anyway? I agree the first six centimeters of ammonia could be higher. Sarah Clem read a quote from Reg 2 to illustrate that only the temperature is given in Reg 2.
MARY BARNETT: Commented that this is one of the situations where taking the date range off gives us a little more wiggle room on how to apply – if we were given data that the fish bred earlier.
MARY BARNETT: Asked if there were any more questions or comments about ammonia criteria assessment? Moving on to the next item on the agenda: Historically, ADEQ used a rounding method. There were concerns about the confidence in our assessments. In order to address that, we looked into a method that other states have used: the binomial method. Look at the handout and on the back you see that going to this binomial method would have a 90% confidence in our assessments. Mary Barnett referenced a document she sent out previous to the meeting which compares the rounding method confidence and the binomial method confidence. The rounding method was around 60% confidence and the binomial method was 90% confidence in our assessment. Are there any thoughts on us moving to the binomial method?

MIKE ARMSTRONG: Commented that he thinks it is a good movement forward and I like that you are using a statistical background to increase your certainty. My issue is that you address the Type I errors, the false-positive – where you make an impairment decision when there is not actually impairment there. The flip side of that is the Type II error, the false-negative – assuming there is not impairment when there is actually impairment there. How you structure your testing depends on which one you are focusing on. So, by focusing on Type I error, you increase the possibility of a Type II error. In a policy sense, the department is making a decision that the cost to the state of making an impairment decision when there is not actually one there, is higher than if you declare impaired and it's not. On a technical standpoint, you're good, but from a policy standpoint, I think you all need to clarify that that is what you are saying. I have two suggestions: 1) That you go back through each water quality constituent and do a cost assessment (qualitatively, table-top exercise). It is probably true that if you assess the cost of a Type I error (false-positive), the cost of the impairment decision is probably higher than a Type II (false-negative), not making an impairment decision. I want to make sure that the reverse is also true. 2) I think it needs to be stated in the Assessment Methodology that that is the policy decision of the department, that we consider a Type I error a higher cost, and therefore, we are putting more certainty into not making a Type I error. In the interest of transparency, I think that would be good thing to have in there: To understand *why* you are putting that focus on Type I error.

DAVID PETERSON: Commented what was said is true, except that the methodology is robust, which is to say if you decided to change the policy later, in favor of the false-positive, you can change the confidence at any time and use the same methodology. The policy can be changed, but the methodology gives the smallest possible false-negative, which is really a benefit.

MIKE ARMSTRONG: Responded it's a benefit if the policy is you want as much certainty into not making that Type I error as you can get. And, the flip side of that is you increase the possibility of a Type II error. What is more costly to the state? Making a Type I error – something is impaired when it really is not - or a Type II error - something is not impaired, when it really is impaired. The policy is putting a high degree of certainty into not making a false-positive.

DAVID PETERSON: Asked in the context of, "*Is this good methodology"*? The answer is yes, this methodology minimizes the Type I error. The policy can change, but the methodology seems right to me.

MIKE ARMSTRONG: Agreed the methods are good and like to see movement in this direction. In the interest of clarity and transparency, you've got to admit that.

RYAN BENEFIELD: Commented that the other change I notice is you don't make assessments based on less than three samples, at three samples you start making assessments. It used to be 10, right?

MARY BARNETT: Replied that our methodology still states 10. It looks like we may need to revise this table.

RYAN BENEFIELD: Responded if the table stays the way it is, they would call something impaired based on three samples now, whereas before they would not call it impaired until you had 10 samples.

MARY BARNETT: Replied we would asses 10 or more samples. Not that there would have to be 10 to say there is an impairment; there would have to be 10 samples to do an assessment.
RYAN BENEFIELD: Commented, that's true, but this says if you have three samples, and all three show exceedance, that means it's impaired?
SARAH CLEM: Responded that Mary is saying we are going to revise this table so that it accurately reflects…
RYAN BENEFIELD: Replied, "Oh, okay".
MIKE ARMSTRONG: Commented what the table *is* saying, is if you have 10 samples, even with the 10% exceedance standard, you need three exceedances, which is actually 30%, to have 90% confidence that it is truly impaired.
RYAN BENEFIELD: Commented that he is fine with taking out those columns. Taking those out solves that issue.
MARY BARNETT: Responded that we will revise that table.
SHAWN HODGES: Commented when I first saw this table, I thought you had reduced the number of exceedance values due to the increased confidence. If that's the case, then instead of 25% exceedance, move that to 20%.
MARY BARNETT: Replied, "I'm sorry". I'm still not following.
SHAWN HODGES: Responded for instance, in the Reg, the true exceedance represents 30%, not 10%. You would change it to 30?
MARY BARNETT: Replied, "No". It would still state 10%.
MIKE ARMSTONG: Commented as your sample size goes up, the number of exceedances comes closer to it. If you take one sample a month for five years, that's 60 samples. Two points: 1) an inferred or implied policy statement and 2) the cost of making the cost is probably fine for most water quality constituents, probably not for toxics and other constituents that have an affect human health.
SARAH CLEM: Responded Mike, you are right, this will not apply to toxics. And you are correct in saying this would not be used for *E. coli*, we would use the same we are using now for *E. coli* and other toxics.
DAVID PETERSON: Commented that policy does enter in, but the statistical procedure is best.
MARY BARNETT: Stated that we have captured this discussion with some important points for us to look into, with some clarification as to which water quality constituents this applies to.
MARY BARNETT: Moving on to comments made by the Ozark River Stewards and by Carol Bitting regarding karst geology and the sensitive nature of karst watersheds not being taken into account during assessment decisions. And, we also have had discussions about the potential for prioritizing Category 3 waters, which are those that don't have enough data to complete an assessment. Internally, as we've been discussing these two concerns, we determined the best way forward at this point is to prioritize karst watersheds by revisiting them when they are in Category 3. Mary Barnett referenced the handout and asked for discussion.
MELISSA LOMBARDI: Commented the notes talk about the karst recharge zones, are those USGS delineated? Is there some other layer you use to get that information?
TATE WENTZ: Replied the department has received karst recharge layers from USFWS and others, TNC, that we use for permitting decisions and site violations.

MARY BARNETT: Asked if there is any other discussion on that? Good breaking point.

Break 1:50 – 2:00

2:03 – 2:55 Discussion of Assessment Methodology Sections

MARY BARNETT: Announced that the next topic is the Beaver Lake site specific nutrient criteria assessment. And, the first decision we made is the period of record.
TATE WENTZ: Commented that the idea behind making it more of a calendar year; if we stuck to a March/April, it would truncate the dataset. You couldn't calculate a true annual average, and you also would lose a growing season geometric mean, and it's more in line with how the standard was developed. So, we put that to more of a calendar year period of record.
MIKE ARMSTONG: Asked if Colene Gaston is on the phone?
MARY BARNETT: Replied, "She is".
MIKE ARMSTONG: Commented that she had asked why we are not using the entire period of record rather than the five year, 2012-2016.
MARY BARNETT: Responded that she has the comment here, and it was more specifically for all criteria that have annual averages, would it be appropriate to have the same period of record for all criteria – not just the Beaver Lake criteria. I think that's an important point for us to look into.
COLENE GASTON: Responded, "Thanks, Mike." I was curious if you're going to use a calendar year period of record for criteria based on annual averages and why that might not be useful for other criteria as well.
MARY BARNETT: Replied that is the beauty of this workgroup, because internally we haven't thought about that yet.
JOHN BAILEY: Stated that the extended period of record for Beaver Lake assessment is, in part, due to the high percent error associated with measurement at the site. So, extending period of time through which measurements are made showed a greater confidence of coming up with the correct determination. Is that correct?
MARY BARNETT: Replied that more specifically, the criteria for Secchi transparency was developed to be an annual average. When looking at the period of record, April – December is not a full year, so that assessment wouldn't be a true annual average. So, extending it would allow to get an actual annual average.
JOHN BAILEY: Responded, "Okay." I understand.
MARY BARNETT: Moved on to the next part of the assessment - which included how the data is collected, how much data is needed? We will have this for all parameters; we just don't have that to you all yet. So, this is what we have for the data requirements for the Beaver Lake nutrient assessment (*referencing handout*). You can see when it's going to be measured; chlorophyll a, in the growing season. This is spelled out in the Reg., but in the previous Assessment Methodology it wasn't really clear. Minimum number of samples in order to make an assessment is in there and then the spatial requirements.
BOB MORGAN: Commented that Beaver Water District had some questions on the minimum distribution of samples. You have 12 samples for the annual average for Secchi depth, which makes sense. But, you only have five samples for the chlorophyll, which doesn't match up with the six months of growing season data. Why? Also, we

made the assumption that you are allowing for one sample to be thrown out for QA reasons, why didn't you do the same for Secchi depth? Sometimes you just can't get all the data.

MARY BARNETT: Replied that you are correct. We did think about a situation where the QA was off – that's why we allowed that five sample. Colene Gaston made a comment about having 10 instead of 12 measurements for Secchi depth. We need to revisit this discussion. There will be situations when you can't get a chlorophyll sample or a Secchi transparency.

BOB MORGAN: Stated that the language "evenly distributed" sets you up for a lot of discussion. Does that mean do it every thirty days? Or on the thirteenth of every month? Or just during the month? The USGS sets up their schedule at the start of the month, and they do their sampling during the third week and fourth week. "Evenly distributed" is difficult to do.

MARY BARNETT: Responded that "evenly distributed" does not mean the same week every month – but not 12 samples in January.

BOB MORGAN: Replied then it should say "evenly distributed through the year".

MARY BARNETT: Responded that this is another beauty in this: when we read it, we know what we are trying to say - but, sometimes it doesn't come across as well.

SELENA MEDRANO: Suggested that ADEQ may want to think about a minimum separation between samples. For instance, no more than two weeks close to each other.

MARY BARNETT: Replied, "Okay".

JIM MALCOLM: Presented a scenario: You get 11 samples during the year, and the boat broke in July. You can't do the assessment? I think you are opening up to a lot of disagreement and actually throwing out good data by saying "evenly distributed" because it can be interpreted in many different ways. If you miss one during the year, does it kill the whole assessment?

MARY BARNETT: Responded by agreeing with Colene Gaston's comment that maybe considering 10 samples instead of 12 is a good idea. That is a good consideration.

JIM MALCOLM: Commented that some entity could argue that a missed month is a critical time of the year to get data. Just some thought about what makes representative data. This one may really restrict you from using that data.

MARY BARNETT: Replied, "Okay".

MARY BARNETT: Asked if there any other discussion about what we have proposed.

COLENE GASTON: Stated that she did propose language less specific – to ensure enough data to get a representative picture – but not where you couldn't do assessment because the requirements were too restrictive and limiting. What is the minimum number of samples needed for a valid, representative decision? There are times when things happen, and we don't want a valid, representative dataset to be thrown out because the way the assessment methodology was written for ideal conditions.

MARY BARNETT: Responded that she has Colene Gaston's strikethrough. Mary Barnett read Colene Gaston's submitted comments aloud (Secchi: minimum of 10 monthly samples per calendar year. Chlorophyll a: minimum of 5 monthly samples from May-Oct). Also, Selena Medrano's suggestion to include a minimum of two weeks between samples may be less restrictive than just "evenly". We have some good comments to consider.

JOHN PENNINGTON: Commented in regards to epilimnion versus one meter depth: Looking for some clarification on the distinction between Secchi and chlorophyll a. I want to make sure there is no need to get a Secchi measurement from the epilimnion; if I understand, the chlorophyll a is to come from the epilimnion – wherever that may be.
TATE WENTZ: Responded that is still some carry-over from the existing language. And that's what we've discussed – where can we revise that language to fit? We think this can be updated to read more consistent. The Secchi depth is what it is. Does that make sense?
JOHN PENNINGTON: Replied, "Yes".
BOB MORGAN: Asked if the language "chlorophyll a sample depth shall not exceed one meter" will be changed to be "the epilimnion"?
MARY BARNETT: Replied, "Yes. That's correct".
JIM MALCOLM: Noted that this is a great discussion. The nature of the chlorophyll a sample and the density of those cells can vary greatly within the epilimnetic depth. That comparability issue with chlorophyll is really different from other parameters: Just a word of warning that the same language may not be appropriate for this parameter. Just a thought.
JOHN PENNINGTON: Responded thank you to Jim Malcolm for that thought. Another thought: When we are talking about the measurement of chlorophyll a - the data from 1980 to now suggest great variability. Do you have any data wishes or are there gaps in data – areas where you would like to see more data collected?
TATE WENTZ: Responded that first we need to go back to the original workgroup report, where the chlorophyll a data was collected – to make it consistent with how the standard was developed: I believe it was one meter depth, but I need to go back and check that. That's where the standard should be applicable: how it was derived.
BOB MORGAN: Stated the report specifically states one meter. I don't know if that's where the data were collected, but that is what the report states.
TATE WENTZ: Responded that we've had so many conversations about this; where it's epilminmetic depth or one meter – it's getting cloudy. We will go back and check the workgroup report and make it consistent with that.
BOB MORGAN: Commented that chlorophyll a can vary by several parts per billion within the epilimnion. The other side of that is: it doesn't always occur in both directions. Like you said: look at the report and how it was generated and see which way it needs to go. There's a lot of variability in that data.
COLENE GASTON: Responded that looking at the chlorophyll data, it's my understanding that within the epilimnion, over time it really doesn't make a huge difference.
BOB MORGAN: Stated that he looked at the Beaver water intake data and could not find a significant difference in means between three feet and six feet over a long period of data. Any particular data point would have a significant difference, but if you look at the whole dataset, it kind of evens out.
MARY BARNETT: Commented that we will definitely look into the original criteria development workgroup's report and see how those standards were developed. Do we have any other discussion about the Beaver Lake assessment?

BOB MORGAN: Replied, "Yes." On the listing methodology, any time you have three or more exceedances of chlorophyll, it's a violation or non-support. And, any time you have three or more Secchi depths less than 1.1 meter, it's non-support. Two or three years you could be out for chlorophyll and the other years you could be out for Secchi depth, but it will still be supporting. Was that what was intended when you wrote that?
TATE WENTZ: Responded I'm pretty sure we intended it to be cumulative, so you could have two years of Secchi violations and one year of chlorophyll, but cumulatively, three out of the five. Listing and delisting language and all criteria haven't been vetted internally yet, so the intention is to re-write and clarify for the redline strikethrough.
BOB MORGAN: Responded so the intention is, any three exceedances – whether it be Secchi depth or chlorophyll – would constitute nonsupport.
TATE WENTZ: Replied, "Correct". We talked about "and/or".
JOHN PENNINGTON: Commented for Beaver Lake, the standard has been established, and it is the first in the state, and it is anticipated that this will be used as reference for the development of standards for other lakes in the state of Arkansas. Recognize that all lakes are not the same. Curious if you guys will take into account the different features of each lake – or will you take a one size fits all approach?
TATE WENTZ: Responded based on our nutrient criteria development plan, lakes are taking a back seat. Right now as far as nutrient criteria, we are at wadeable streams. As we get to lakes and reservoirs, we are not sure how we will approach it. Each lake is different, but there may be some instances where a one size number is more appropriate, and there may be instances where site specific criteria is more appropriate, but we don't want to comment on that yet.
DARCIA ROUTH: Stated that ADH has been partnering with some agencies with some of these concerns. One thing we are doing in anticipation of the triennial review; we are going to have an engineer intern this summer go to all the prioritized drinking water lakes, especially those with cyanotoxin bloom concerns, and we will begin collecting baseline stuff. ADH has gotten really good help from ADEQ water division – they've shown me how they are collecting the type of data that can be used in assessment. We are also interested in having something beyond just a proxy for nutrients.
MARY BARNETT: Noted this has been a very productive discussion, and I appreciate everybody taking the time to look over this and consider how it affects the assessments. We will move on to agricultural and industrial water supply use assessment. We received a comment during the listening session from AEF asking if it was appropriate to use 250/250/500 minerals criteria for agricultural and industrial water supply use. Our response at this point in time, is that there is no clear answer on the best way to move forward. Looking through our regs, we have had something similar to agricultural/industrial water supply uses since the inception of the water quality standards reg. I also reviewed our assessment methodologies, since at least 2000, the 250/250/500 is used to assess the agricultural/industrial water supply use. That's just history; that's not addressing appropriateness. We also did an exercise where we looked at several different states methodologies and how they assess those uses. There appear to be a wide variety of parameters; it just doesn't seem like there is a clear path. We don't have an answer right now. In lieu of not assessing the uses at all, we would assess toward the most protective end of the uses. So, for Arkansas, that is 250/250/500 for the domestic water supply, minerals criteria.

DARCIA ROUTH: Stated the secondary standards for drinking water (250/250/500) make it really difficult and expensive to treat the water. So, we already push people toward better water as a public water supply: Difficult for people to meet the standards for their surface water treatment plants.
BOB MORGAN: Commented on the limits of 250/250/500 for secondary water supply: if we get water that's 250 mg/L, we can't meet our standards, because we have to add 15-20 mg/L sulfite to treat the water. So, it's got to be somewhere below that.
VINCE BLUBAUGH: Stated the issue is not 250/250/500 for domestic, it's the agricultural/industrial water supply. We want to make sure streams aren't getting listed for agricultural/industrial water supply use – when we don't have defined criteria. Selena Medrano – I noticed the review didn't have any Region 6 states; did y'all look at any of those?
MARY BARNETT: Replied, "Yes". We didn't see clearly defined methodology.
VINCE BLUBAUGH: Responded that our whole point is: we don't want to see streams listed for tag along uses (agricultural water supply).
SELENA MEDRANO: Responded that Texas has 250/250/500, but they assess it differently. They assess based on an average instead of a percentage. But, as far as the other states, I don't know.
ALICE ANDREWS: Asked if you are saying 250/250/500 for domestic drinking water supply as well as agricultural and industrial water supply?
MARY BARNETT: Replied, "Yes". The comment we received was along the lines of the appropriateness of the 250/250/500 for ag/industry. It is also applied to domestic water supply, but that concern wasn't raised in the listening session. At this time we are not going to propose any revisions due to the fact that we don't have a clear path on what an appropriate revision would be.
DARCIA ROUTH: Commented that a lot of this was received in the last eight hours of workday, and I have not had the chance to look closely at a lot of the things we are talking about. I would like to reserve the chance to comment once I've had the time to look over more thoroughly.
SARAH CLEM: Responded that our current position is we won't change how we assess. We will maintain how we have been doing it.
DARCIA ROUTH: Stated that she was also thinking about the compilation of the other state's assessment; I haven't had time to look over that. We would like to go back and discuss before moving on. I haven't given it the attention it deserves yet, for some of these.
MARY BARNETT: Agreed that information did go out very late yesterday. We have one more meeting after this, so there will be time to express more concerns.
JIM MALCOLM: Made a recommendation: Untying those is a good idea, and investigate making the assessment for each one of them, because they are not the same. I am recommending we look into that rather than just leave it alone. Maybe I misunderstood what you were saying, Sarah.
MARY BARNETT: Responded that it is probably appropriate to look at them each individually, but we are concerned at this point, there may not be enough time to do an adequate job, and we don't want to throw something into the assessment that has not been thoroughly considered.

SARAH CLEM: Commented that we still have more time, one more session. In the interim, if you come up with particular parameters or concentrations that would be appropriate – and anybody else even - we would be open to that.
JIM MALCOLM: Stated he is afraid to say anything else.
MARY BARNETT: Commented that we have wrapped up that topic for now. The next topic is biological integrity. AEF has asked why our methodology is different from EPA's rapid bio-assessment protocol. Tate Wentz has a presentation.
TATE WENTZ: Commented the purpose was to answer the question from AEF: Why did the department deviate from the EPA rapid bio-assessment protocol. Tate Wentz presented PowerPoint presentation to group and ended by asking for any questions or comments.
JOHN PENNINGTON: Commented, "Thanks".
JIM MALCOLM: Commented that he would like to reiterate something Darcia Routh said, which is that we just received this yesterday. Read aloud AEF's prepared statement. From **Charles Miller**: "As part of the ADEQ 303(d) assessment workgroup discussions/reviews, the AEF raised questions regarding apparent differences between ADEQ's benthic scoring system and attainment status categories (part of ADEQ's Biological Integrity 303(d) Assessment Methodology) versus EPA's Rapid Bioassessment benthic scoring system (Plafkin, et at 1989). AEF specifically requested written review and clarification of the differences. AEF received ADEQ's response to this request yesterday, February 22, 2017 via email, thank you. We have ***briefly*** reviewed ADEQ's response at this time. The AEF will provide further written comments in response to the ADEQ policy after having time to review and confer with the membership."
JIM MALCOLM: Commented that at this time we have only briefly reviewed the response, and we will provide a written response with more time. We would like to reserve time to comment.
TATE WENTZ: Responded, "And, rightly so". This is heavy stuff to digest; by all means.
MARY BARNETT: Noted we are due for another break. We will begin again at 3:05.

Break 2:55 – 3:05

3:05 – 3:40 Discussion of Assessment Methodology Sections

MARY BARNETT: Explained that the next two topics for discussion stem from the same question. During the listening session, we received a comment from Beaver Water District generally asking why the percent exceedances were different for bacteria. Why different from 10%? Also, during our previous meetings there had been a request to have a discussion about why other parameters were different from 10%. We are going to start with bacteria. I sent out a document that had the history of the bacteria assessment. In 1997, EPA's 305(b) guidance document suggested assessments for fully supporting ($\leq$ 10% exceedance), partially supporting (11-25% exceedance) and not supporting (> 25% exceedance). Originally, there was a 25% exceedance rate used for non-support decisions. Then, we had new guidance that suggested getting away from the partial supporting – and just going to supporting or non-supporting. That is where the 10%

exceedance rate came in. EPA's criteria recommended a geometric mean for bacteria as well. That is a general run through. This is an explanation of where the 25% exceedance came from and why it was appropriate historically.

RYAN BENEFIELD: Commented that when you are looking at percent exceedance, I always thought what you are looking at was: 1) the normal variability of that parameter, and 2) the risk from that parameter – which are factored into that decision. You have to look at the parameter itself to determine what percent exceedance is appropriate: Toxics on one end, other parameters on the other end. The parameter could justify a lower exceedance – is how I've always viewed setting the exceedance. We are very strict in Arkansas right now on how we do those. Some states use an annual average – which if you use an annual average for minerals, you could have a 50% exceedance and still be okay. We need to look at each parameter and see where it needs to be set and not just default to 10%.

MARY BARNETT: Responded I think you bring up a good point. The way bacteria are analyzed is different from conventional parameters – in that the sample is run across media, incubated, colonies counted, then calculations are done to derive the final number for the sample. There are several different ways to do that calculation and you get slightly different results based on the calculation you use. In this case, the 25% exceedance for this parameter will take into account variability built in with the method itself.

COLENE GASTON: Referred back to the Beaver Water District comments – they are basically in line with what Ryan Benefield is saying. There should be a scientific justification or rationale – and it would be helpful to have that in the introductory section of the Assessment Methodology, so that once this has been thought through and we know why we are departing from the general 10% rule of thumb, it would be helpful to have that set out for future years. That was our request: an explanation.

MARY BARNETT: Agreed that it would be helpful to have an explanation in the methodology itself, so that anybody could pick it up and have an understanding of why it's different.

SELENA MEDRANO: Stated that is going to vary by parameter and by the type of the standard – whether it be acute or chronic – that type of deal. In guidance, it specifically says for non-traditional pollutants, EPA does not encourage the use of the 10% rule. As long as there is a justification as to why it is 20 or 25%, I think it is okay.

MARY BARNETT: Commented that in another topic in one of our previous discussions, someone asked for examples of how bacteria assessments are conducted, and I sent that out as well – for your review. As questions arise after that is reviewed, we can discuss those. Are there any comments regarding bacteria and the variation from the 10% rule?

MARY BARNETT: Stated the other topic on this same general idea is turbidity. I sent out a history of assessment criteria. Referencing handout: Historically, there was support, partial support and non-support – and then it went to just support and non-support and how we've gotten the 20 and 25% exceedance rate. Are there still concerns about the turbidity deviating from 10% or is the concern more just having the justification in the methodology itself?

RYAN BENEFIELD: Responded that turbidity is locked in because of Reg 2. Honestly, the justification is that it's specific to Reg 2.

SARAH CLEM: Commented that the only consideration there is that we have to take into consideration the most recent decision by EPA, and they have stated that the revision to the criteria exceedance given in the turbidity standard – they have taken no action. Therefore, that change does not exist; it is essentially not there.
RYAN BENEFIELD: Asked what did y'all change?
SARAH CLEM: Referenced Reg 2: The values below (the ecoregion values) should not be exceeded during base flow (June-October) in more than 20% of the samples, and the values below should not be exceeded during all flows in more than 25% of the samples. So, it reverts back to the previous version of Reg 2.
RYAN BENEFIELD: Asked was the 20/25 not in the previous version? I thought you changed the "all" and "base", not the 20 and 25?
SARAH CLEM: Responded that was one of the revisions to that standard: "Storm flows" was changed to "all flows", but then also it essentially reverts back to 20% in the previous version.
MARY BARNETT: Commented that in 2016, the Reg had 20% for base flow, 25% for storm flow. According to EPA for Clean Water Act purposes, they are still as they were in previous versions (2008, 2010, 2012 & 2014). Those percent exceedances are still in the Reg.
SARAH CLEM: Responded that they could flip it, but in my opinion, you would still have to use only that one percentage rate that is now included. So, it's in the Reg: yes, we do have to follow that one.
MARY BARNETT: Asked if there are any more thoughts on turbidity percent exceedances?
MARY BARNETT: Stated we are at the wrap-up part of our meeting. I know everyone is eagerly awaiting the draft redline strikethrough. We are still hopeful to get that out to you – hopefully early enough to give you a full week to review before our next meeting. It is still under internal review. I don't know if I can get it to you in the next week. It may be that we need to revise our next meeting date.
DARCIA ROUTH: Commented we will need at least a week to review and talk about it internally.
MARY BARNETT: Asked if there are any topics about the Assessment Methodology that we haven't covered at this part? Or are there any topics that we need to revisit?
COLENE GASTON: Asked what was said about the timing of the next meeting?
MARY BARNETT: Responded I think it would be most appropriate for the workgroup to have a full week to review the redline before the next meeting, so it may be that the next meeting date is changed.
COLENE GASTON: Replied, "I would second that". I think it would be more productive if we have sufficient time. Today, we didn't have enough time to digest what was sent in advance. We are looking for an explanation of the variance from the 10% rule – we need to discuss the explanation – whether we agree with it or not. Silence should not be interpreted as agreeable.
MARY BARNETT: Replied, "I understand". I do think we will be discussing that topic internally, and any language that is crafted will be in the redline, so you all will be able to review and discuss it.
SARAH CLEM: Commented if there is anything else you guys think of in the interim, feel free to email us and let us know. Thank you for your patience as it relates to getting

the redline strikethrough out; we've been working very hard and diligently to make as clear as possible. I'm very proud of the Planning section and the large amount of work that they've done to get this to you. Thanks for coming to all these different sessions and thanks for your input. We've had a lot of good discussion and you guys have really thought this through.
MIKE ARMSTRONG: Asked to clarify: If we still have additional comments on the things we've discussed today, go ahead and send them to you now?
MARY BARNETT: Affirmed send now.
MIKE ARMSTRONG: Asked should we send to the whole group?
MARY BARNETT: Responded if you want to that is fine, or if you prefer to send to me, that is fine as well.
MIKE ARMSTRONG: Asked when is the next meeting?
SARAH CLEM: Responded that we would say in two weeks, but we are asking for the flexibility to change that date. The next step: it is our intent to share the redline strikethrough for you to review – then we can get that feedback, gather recommendations, present to the director and from there – go out with that final document to the entire public.
JIM MALCOLM: Replied, "Mike Armstrong, since you're retired…."
MIKE ARMSTRONG: Responded, "You're pushing into fishing season…"
MARY BARNETT: Replied, "And assessment time too…"
MIKE ARMSTRONG: Commented that we appreciate the patience you have with all of us and appreciate the opportunity to be part of all of this.
MARY BARNETT: Replied, "Thank you".