LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

OCTOBER 2013 BOARD MEETING

ITEM NO. 4

MR. PUMPHREY: Item 4: Discussion of the Water Board's Role and Authority in Managing the Discharge of Salts to Groundwater of the Lahontan Region.

MR. PLAZIAK: Good afternoon, Board chair, Board members, public. I'm Mike Plaziak, Supervising Geologist and Office Manager -- Region Manager for the South Lahontan Basin Division of Victorville.

I am presenting the Water Board's Authority -- or Role and Authority in the Discharge of Salts to Groundwater. And if you recall, part of the -- part of the reason why we're talking about this -- there's two reasons, actually.

One dovetails into a comment that was made in our July Board meeting when the regulating community -- the general manager for the Victor Valley Water Reformation Authority had a concern about how we develop a permit and those effluent limits that go into a permit ultimately.

And -- and the point he wanted to make, I think, and emphasize among other points -- and I'm not going to go into the other ones -- but the one point that -- that he wanted to emphasize is that an incremental change in water quality and improvement that is required in -- in a WDR issued by the Board can have a substantial increase in the cost not only to the

discharger but also to the community. So -- and -- and I think the point well taken.

The other -- the other reason for wanting to bring this up to the Board is that staff wrestle with this -- this type of analysis, these types of decisions, and how we come -- or -- or, I should say, how we make the sausage to bring a WDR for you to adopt at a Board meeting.

So this -- this ties in really well. And I'm hoping that we're going to have more discussions in the future as we get into some -- some real more -- or I should say more policy -- detailed policy discussions.

So here's our agenda, and I'll talk about the antidegradation policy, some of the factors that we go in -- to consider in making a determination on that degradation policy, and also talk about some case studies that we use to kind of emphasize the point.

What is the State Board's Antidegradation Policy or State Board Resolution 68-16, also known as the Statement of Policy with Respect to Maintaining High Quality Waters in California or the Antidegradation Policy? And for the purposes of this discussion, I'm just going to call it the "Policy."

It's essentially when the -- this policy establishes a requirement that discharges of wastes and waters of the state be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state. And I'm

going to go into what that means.

The policy was adopted in 1968. The Department of Interior asked for all the states to come up with an antidegradation policy. California did so. Years later, the EPA came up with its own antidegradation policy -- 1972, I believe. And the difference between the -- the state's policy and the EPA's or the federal policy is their policy is really directly related to the surface water discharges. Our policy is 68-16 or "Policy" applies to surface water dischargers and also to groundwater.

Not only does the Policy apply to considerations that are made in terms of issuing a permit, it also involves considerations that are made to require cleanups. Under 9249, State Board Resolution 9429, which directs how we do cleanups or how we require cleanups to be made by a discharger or a responsible party also requires a 68-16 or Policy analysis in there.

So the Policy -- really there's kind of like two parts to the Policy. The third -- I'm not going to talk about -- that was just simply the Department of Interior saying, hey, when you get this thing done, tell us about it. So I think that's happened since 1968, so I'll focus on the first two parts.

The first is the high quality of water. Essentially it's saying whenever there's existing high quality of water, it

must be maintained unless it can be demonstrated the discharge will produce a change of water quality that comports with these three factors: maximum benefit to the people of the state, it's not going to unreasonably affect beneficial uses, and also that the -- could not result in water quality that's less than the Basin Plan and those water quality objectives in the basin.

The other part of that policy or the other area, if you will, talks about when the waste discharge requirements -- or when the Board is issuing waste discharge requirements for discharge to waste into those high quality waters, the Board must ensure that the discharger finds the best practicable treatment and controls to prevent a pollution or a nuisance and that it maintains the highest water quality. Again, the maximum benefit of the people of the state.

So those are the two main components of this Policy. And every time we issue -- or I should say the Board issues a permit that does involve a discharge to a surface water or the groundwater, that analysis -- you'll find that in that policy -- or in that -- that WDR. We'll go through that whole process.

And this is what we're going to talk about a little bit today is how we can do that analysis and how we make those findings that you're able to push the "I believe" button when we say that the degradation that's going to occur from this discharge is in the best interest of the people of the state

and still maintains the highest water quality.

So what do we mean by "high quality waters"? Well, when we're discussing water quality, we do so in context to a water -- water's physical, chemical and biological characteristics. So any water that has those characteristics that are better than a water quality objective is a high quality water. All right?

So an example would be water that we know in some basins as, you know, TDS of 250 to 300. And we know that our -- our secondary standards are 500 to 1000 to 1500. That water would be a high quality water.

You can have a high quality water and it -- it's -- it's constituent specific. You can have a high quality water with respect to say TDS or nitrates. In other words, they're below the -- the water quality objective for a municipal use yet not be for some other use or vice versa. Talk a little bit more about that when we talk about some of these other cases.

The other term that I think needs to be discussed or talked about in a little more detail, and that is: What do we mean by "Maximum benefit to the people of the state"? That's a hard one to wrestle with. And that involves a number of things that have to be considered.

And, here, I'm showing them. It's -- it -- you know, for a request or a report waste discharge that comes to us from a discharger proposing to discharge a waste into water of the

state, we've got to make some analysis. We've got to do some -- some determinations here.

There's four categories that we're going to look at. We're going to look at the beneficial uses of the receiving water -- all right? -- to determine whether or not that receiving water has immune beneficial use, which would have the highest protection standard, and all the other beneficial uses.

The environmental factors: What's the background of water quality? What's -- what's -- what are some other dischargers that are occurring into the basin, if you will; up gradient; other anticipated uses for that resources? What are some other beneficial uses; or I should say assimilative capacity? And I'm going to talk more in detail what "assimilative capacity" means.

Then, also, treatment: What are the different treatment options that are available, feasible? And then that fourth one: The economic and social benefits that are associated with the discharge, not only to the discharger but also to the community or the people of the state.

So as we're doing that analysis, we've gotten that report of waste discharge that's come in, for a discharge. Let's say a wastewater treatment plant plans to upgrade -- not upgrade, but increase its flow.

So we've gotten that report of waste discharge, and staff's got to go through some -- some quick analyses with the

data that they get. Sometimes we'll get a good indication that this discharge is going to be small. You know, locally will have a small footprint, maybe temporary, maybe it's a -- it's a -- it's a case where we're going to see an increase in TDS over a period of time, that that will be ameliorated, you know, after six months or a year.

Like, for example, I think years ago when we had to -- to do this type of analysis for PG&E and use of irrigated -- use of irrigation as a disposal option, and we looked at the fact that salts would be discharged or at least salts would be flushed through the ozone into the groundwater and there would be an increase in nitrates and TDS, but then it would come down over a period of time. But that -- that was a -- a quick assessment. Actually, it turned out to be more complex, as I will explain here what the complex antidegradation analysis entails.

But we're going to look at those factors. How big is this discharge going to be? What's the -- what's the expected size of -- of the degradation that's going to occur? Again, it's -- it's -- is it temporally limited? And then is this just a minor change in the water quality? Are we talking like one or two percent? In those cases -- and we can -- we can work through that without having to require the discharger to come back to us with any more information. Okay?

And sometimes, not all the times -- actually, most of

the times not, if they've done a good CEQA analysis, we should see what those effects would be if there is a potential force indicated, and -- and we'll be looking for that. A lot of times, though, if it is going to have a significant impact, we're going to know -- we're going to move into the complex or detailed antidegradation analysis. A lot of times we're going to go back to the discharger to request those additional elements.

Really what those -- those are is getting a better handle on the environmental characteristics, what we know about flow, what's the water quality, those kinds of things. But not only that, you can see when we see that or get an indication that there's a substantial increase in the mass of pollutant, you know, 50 percent more, 100 percent more, then we're going to want to get a detailed antidegradation analysis. I'll go into what's going to go into that.

Also, if we can see that -- that potentially there may be some mortality involved in that change in water quality or biological communities or some changes to growth or reproductive impairment, those also would cause us to request a -- a complex antidegradation analysis.

I wish I could tell you that there's, you know, four or five steps to getting an antidegradation analysis done by the discharger. Not the case. We see many of these and there's no, you know, set pattern or cookbook way of doing

these. Some of them will be very detailed. Some of them not. And we go through that (inaudible) process with -- staff will go through that with discharger.

The other thing we're trying to see in these analyses is what's the impact not only to water quality, but, again, the social-economic impacts. If we are to require greater controls on that discharge, what's the -- the effect economically and also socially?

So to those four factors that I talked about, the first one, beneficial uses, obviously when you look at the Basin Plan, that's -- that's where we're going to go to. We know that there are 22 beneficial uses of the Basin Plan. Out of the 345 sub-basins and basins in the region, 344 of them have the municipal beneficial use. The one in Searles Valley does not.

Not to say, though, other beneficial uses wouldn't apply: industrial or potentially agricultural. If fact, many of those do. If you look through the Basin Plan, many of them apply.

So we're looking to see what are the beneficial uses that could be impacted. Okay. Once we've got an understanding of that, we're also looking at the environmental data that are -- are available to us.

In this case, this is a -- this is a map produced by Mojave Water Agency, and this is their service area here in

red. And the dots -- it doesn't -- you don't need to see the actual numbers next to dots or whatnot, but the dots just indicate areas that -- where there are low and high TDS.

There's a source for us. There's a repository of information just like the U.S. Geological Survey. And this -- this is a good case scenario because I'll tell you Mojave Water Agency has some great data. And, in fact, they're working on that Salt/Nutrient Management Plan along with Victor Valley Water Reformation Authority to -- to help us understand our loading to the basin.

But what you can do with the data are produce maps like this. And then the beauty of a map like this that helps staff is that when you look at these -- you know, this -- this color coding of sub-basins within Mojave Water Agency's area, well, you can see that the dark green, those are good areas -- areas where there's good water quality. Very high water quality, 100 to 300 TDS. As in contrast to these areas where it's red, where you can see that we've got TDS as high as 900 to 1100. All right.

But that helps us to understand for that particular proposed discharge, we're changing the discharge where it occurs in the basin, they help us to understand if we need to be concerned about additional self-loading and perhaps putting greater controls on that discharge so that we don't have a problem and see a basin go from yellow, like this one here,

into the red zone.

So those are -- those are great tools for us. Don't always have those when we're -- when we're getting a report of waste discharge. But we've got to go back to the discharger to get those data gaps and fill those data gaps to help us to get a better picture.

We'll talk about assimilative capacity. Well, what is that? Well, that's the ability of the water body to take and to project sources as well as natural and taking those -- those constituents, I'll say, not sources, but anthropogenic and natural constituents into -- into its water body and still being able to meet those beneficial uses. All right?

I have a graphical depiction here that will kind of help cement what I'm saying in words and to orientate you to what we're looking at here. This y-axis, A to B, is just say a concentration of a constituent -- could be anything: a TDS, nitrate, whatever -- from A to B increasing as we go up.

So we know that in an aquifer, background water quality is, say, here. So anything -- any discharge that causes a change in water quality above background up to the water quality objective of beneficial use standard will be a degradation. Anything above that would be a pollution that would need to be remediated, low or high.

So our assimilative capacity then would be what's ever in that -- that zone between Background Water Quality and

the Beneficial Use Standard. If we allow a discharge somewhere in that -- that zone, then what's left is everything from the point where the discharge -- the -- the concentration in the aquifer after the discharge up to the Beneficial Use Standard.

And here's an example of that. So if you will turn to Enclosure 2, you'll see what I'm talking about here with the relationship to --

UNIDENTIFIED PERSON: What page is that; do you know the --

MR. PUMPHREY: 4-15 or 15.

MR. PLAZIAK: Yes, 4-15.

In fact -- and I'll be talking off of page 417 -- 4-17. And you're going to see in there where we did an actual calculation. This is for the Apple Valley Sub-Regional Plant. The Victor Valley Wastewater Reformation Authority brought -- or requested a permit from you earlier this year. All right?

So how did this work in the analysis? We looked at the fact that -- oops -- the sub-regional plant could discharge an effluent of quality of about 8 milligrams per liter. And we're talking about nitrate here in this -- this particular example. And the background water quality is 3.4.

So you can see the result in the degradation represented by the red point right there after the discharge is predicted to be 6.5 milligram per liter. So that leaves us with 3.5 milligram per liter in nitrate. That's the

assimilative capacity. So that's what's left for any other discharger that comes in and wants to use the beneficial use -- or use assimilative capacity for their discharge. All right?

When we went through this analysis with them, we looked at technology. They used a membrane bioreactor to treat the -- the nitrate. We also noted that the degradation was limited to a half mile from the discharge point, and they did a column mixing zone type of analysis where they looked at a mixing zone of about 50 feet deep and out to half a mile. And this is -- this is what they concluded, that water quality out to that half a mile radius would be degraded up to 6.5.

And certainly when you look at the fact that nitrate increased from 3.4 to 6.5, well, that's a doubling. That's a hundred percent increase. Why did we allow that? Well, I think the analysis that we did will show that this was in the best interest of the people of the state. It did -- as you can see on here, the degradation was limited to a localized area, for one.

Two, there were no known or foreseeable uses of that assimilative capacity within a half mile zone anticipated. And when you look at the fact that treating that water, putting -- putting it to not only the membrane bioreactor but sending it through reverse osmosis would in fact double the cost to -- not -- not just to the -- to VVWRA but also to the rate payers. They were going to see their rates go up from $11.00 to 22.00.

All right?

Those are the kinds of analyses that went into the recommendation to allow that -- that degradation at that level. That's how we looked at that for the Apple Valley Sub-Regional Plant. The other thing too, I'll mention, this is for a plant that was going to take treated water that's going to be used for recycled water purposes.

So there's a -- there's a -- when they're not using the recycled water, they don't have any users, in other words, for the recycled water, they had to have a place to store it. But ultimately over time, there'll be more users of the water so there'll be less impact into the water quality. This -- this really represents a worst-case scenario.

If you look at Enclosure 1 -- and I'm moving backwards. I apologize from going from three to two to one, but Enclosure 1, Bates stamped 4-7 -- at the Hesperia Plant -- this, again, a sub-regional plant is a WDR that we brought before you back in the early part of this year for a similar discharge like in Apple Valley, except in Hesperia -- the point I want to make here was our TDS discussion. Here the effluent water quality is 370. Background is about 275. All right? And so the resulting water quality was going to be 354.

Now, the point I want to make is that TDS has a three-part standard. It's a secondary MCL or secondary standard because TDS is not a-- is not a primary pollutant.

Primary pollutant being one that will cause health effects. This is a secondary one that has a taste and odor concern. All right? If you get above 1000 milligrams per liter, the water becomes malodorous. It's not very palatable and it's not good for it to be consumed or to be sold. So that's the basis of the three-part standard.

The point here is -- and the challenge for staff is with a three-point standard -- and if you were to go and look at our WDRs over time, we've never put in a numerical number thou shalt meet this effluent limit for TDS. We've said for the receiving water -- the receiving shall not exceed the water quality objectives. All right? Well, which one of these three is it: 500, 1000, or 1500?

What we've done -- what staff have done over the years -- and this has been something -- it's just the way we've done business, and this is what I wanted to get in front of the Board so you get an understanding how we looked at or view the world from our regulatory standpoint.

When we get a report of waste discharge asking to degrade water quality, if the receiving water's background water quality is less than 500, we generally apply that 500 is the standard to which we're going to require controls be applied to the discharge so the discharger has to meet that, and their effluent quality will be such that it will not exceed -- the receiving water will not exceed 500. Okay?

And in this case, with the -- the same kind of conditions existed in Hesperia as they did for Apple Valley as far as the type of treatment. It was MBR treatment. They did not use reverse osmosis. They could have. They could have brought that down even more than 354 down to below 300 if they used reverse osmosis.

But, again, the rates would have doubled in that case. It was still protective of water quality, and there still is assimilative capacity between 354 to 500, so there's 146 milligrams per liter of TDS here. All right? So that's -- that's how we came to that conclusion in that particular case. And you can see more of the details that are in the enclosure. But the point I wanted to bring up is that that's -- that's how we maintain high quality water in places where the TDS is less than 500 generally. That's our rationale.

In areas where the TDS is less than 1000 -- well, this model kind of represents that. If we have TDS that's say 600 milligram per liter and its background water quality, we're going to require that discharge -- the effluent limits that we'll impose on that will ensure that the receiving water will never exceed a thousand. Okay? So that's how we'll apply it in that case.

Likewise, if the receiving water is actually above a thousand, then we're going to use 1500 as that -- that level. Okay? So this is -- this is the rationale that we take when

we're looking at the environmental factors, beneficial uses, and then the treatment, treatment and controls.

And on that subject of treatment and controls, what do we mean by "Best Practicable Treatment or Control"? And, generally, that's the level of treatment or control that is achievable in using best efforts.

What are "best efforts"? Well, that's the quality of the supply of water available to a discharger. Historic effluent quality that the discharger has ever been able to achieve in the past. Like in the case of VVWRA, when we went through that process of a -- of a permit that Brogan (phonetic) was bringing up to you, that we had looked at their ability to achieve, I think it was, less than six milligram per liter for nitrate, so we wanted them to -- to keep to that. All Right? And that was going to cause a significant problem for them when they increase their flows. All right? So -- but we were looking at the historic effluent quality.

We also want to look at other dischargers under similar conditions. What are the technologies that they're using? And what are the levels that they're achieving in their effluent and any other good thing that looks like the discharger is taking to try to get their -- their effluence -- or their effluent limits -- effluent -- effluent quality down to a lower level, to a better quality?

So those are some things that go into that and any

other measures that might be necessary. So technology and performance and cost are those things that -- that they're going to bring up.

When we looked at the fourth factor, socio-economic issues, this is one of the challenge -- the most challenging for staff to go through. We're geologists. We're engineers. We're environmental scientists. We are not economists.

So the challenge is is to go through and read the report of waste discharge or an antidegradation analysis that comes with that report of waste discharge or subsequently and understand what do they mean when they say 200 and some odd jobs are lost in the community? How do we verify that? How do we know? What's the metric that they're using when they make that assessment? And where are their assumptions?

So those are -- those are some significant challenges on there. But it's not only what's the -- what's the cost to the discharger? And the cost to the discharger cannot be the sole reason on a socio-economic factor for allowing the discharge to have a poorer water quality. We've got to be a direct correlation or direct demonstration by the discharger that it's also an impact to the community. It's got to be in there.

So you can see in this case here, if the discharge -- you know, due to the type of industry we're talking about whether it's a bottle, you know, plant discharging salts or

it's some other -- you know, it's a wastewater treatment plant, if there's an increase in employment from that, that's got to be factored in there, or increase in production because now they've got the -- the capacity to do that with a -- a -- a lower cost -- cost to run their overhead.

You know, so does that say -- does the increase in -- in treatment in capacity for a wastewater treatment now allowed for greater development, more houses that come into a neighborhood? That kind of thing. All right?

So what I kind of close on this was some of these challenges. And I talked about the economic and social development challenges where the analyses are a challenge for us to come before you and ask for you to adopt a permit.

A recommendation that I would make and hope that it can be taken to the State Board as well is that we know that there are resources at State Board that can do economic evaluations. The problem is there are not very many. I think there's one individual up there that does those to support enforcement actions.

But I really do think that, you know, when we start to see more and more of these types of analyses come through and we're requesting these -- I can tell you back in the day, we didn't do that as much. We're doing that just to have a better understanding of what's the loading going onto the basin. So we're going to need some assessment for -- I should

say we're going to need some support for those economic assessments so we can -- we -- because it takes the burden off the staff, which don't have the skillsets. We don't have those skillsets. We've got to put those in the right -- right area.

The other thing is I will say is another challenge is the sub-basin-wide understanding of baseline water quality. Now, what Mojave Water Agency is doing is great in helping us out. They have a huge network. They work in partnership with U.S. Geological Survey, but there are other basins that don't have that luxury.

I'll tell you, though, that at least in -- the -- the -- in the southern part of the region and I -- I believe it's the same case in the north, the work that -- that staff is doing integrating in with the IRWMPs and helping them and giving them guidance and helping them understand perspective is gaining traction for us to help them at least understand how we look at TDS, how we look at some of these various constituents as they're developing their models and they're developing an appreciation for salt loading in the basins. I think that's a good thing, and we're going to have to do that.

But data is what we need in order to make those decisions, which is very difficult for staff to tell the discharger that, you know, incur another two or three million dollars in treatment costs and you don't have data to back up why. That's important. And do we see an actual problem of

salt loading in that particular segment in the basin? So data are -- are very important to us.

I talked about the application of three-part taste and odor water quality objective. As you can see, there's some ambiguity. There are going to be cases where the water quality is below, say, 500 and the discharger wants to go over that 500 mark, and they're asking us to give them that ability to degrade the water and use up the assimilative capacity and now -- now to use the 1000 milligram per liter level as -- as the new benchmark.

You know, and that's a -- that's a stand that we've tried to not -- we've tried not to allow that type of situation to happen because you realize that we are in closed basins. We have salt that's going to continue to load. How do we -- how do we address that? What's the -- what's the -- the way we're going to have the -- the -- the information to make those decisions with the discharger to get to a -- to a much better control on that discharge? All right? That's -- that's a challenge for us. Particularly that three-part objective.

And, lastly, and very importantly, the long-term cumulative effects. We produce -- or I should say we work through permits with a discharger for a particular case, but what we need really is to be able to look at the long term and see how these are -- are cumulatively coming together.

And I think one of the tools that we're going to

continue to work with on are the IRWMPs and those efforts because there are agencies like the Mojave Water Agency -- in particular in the Mojave watershed, we're seeing them develop a gross approximation for each basin using the Stella Model.

I think that's good because we can take those gross approximations and then have an understanding of which basins are really more vulnerable to a loading, and use that as a way or trigger, if you will, to require greater controls on the discharge; and while other ones, we might not.

But those efforts that are going on with the Salt/Nutrient Management Planning from the IRWMPs is very important to that effort. And, you know, policies like the State Board's recycled water policy, I think are -- are also helping us out in that regard as well.

So that's -- that's a -- generally, that's it as far as we make the sausage before we bring it to you, and I hope that you got an appreciation for some of the challenges that we've got and particularly when we're dealing with TDS and that staff is trying to keep those discharges to -- again, to maintain a high water quality below 500. And we do that not only for a new discharge but also what we're -- we're evaluating or developing cleanup strategies as well.

I'll entertain any questions that you may have.

MR. PUMPHREY: Thank you very much.

Mr. Sandel, any questions or comments?

MR. SANDEL: Yes. Yes, I do. I -- I -- first of all, I appreciate the -- the great difficulty in dealing with these issues. This is -- this is -- this is tough stuff because it has direct implication of cost to the customer of water treatment, what your monthly bills look like. It's hard.

I think that I -- I completely disagree with the idea that we take this thousand and 1500 as the -- as the -- it's one thing to say that at 500 where we have a high quality water. Once you get past 500, it's not good quality water. You get to 1500, it's really not good quality water. So to allow it to go up a step 500 to be the next -- to be considered that whole range as part of the assimilative capacity seems to be an error in judgment that we would always be trying to push that number down. And the higher the background is the more resistant we should be to allow it to increase at all is the way I would look at that.

Secondly, I think that when we're looking at rate changes to the -- to the local rate payers, that we should be looking at something more than just a percent of increase to them. We should be looking at what comparable districts all over the state are paying.

We know that in some cases rates are artificially low, but other people are paying four and five, ten times more than what these people are paying. And so to say that it went from 10.00 to $22.00, that's really -- you know, that's not

good, but maybe somebody else is paying 60.00, you know, for a comparable system. So we should be making our comparisons more wide ranging, I think.

And then lastly -- and this is not necessarily under our control, but it's something that I think that we could promulgate and work with Mojave Water Agency and others. And that is, we're only looking at one side here. We should be looking at the quality of the drinking water. We could improve the quality of drinking water by RO, for example, and resulting change in the output to the treatment plants would be less TDS. That's another way to deal -- to deal with this issue. Instead of treating the sewage, treat the drinking water. It might be more cost effective. We ought to think about that as part of the overall equation.

MR. PLAZIAK: I -- I appreciate those comments because that -- that helps us have a better understanding of where we draw the lanes in the road.

MR. PUMPHREY: Anything else, Mr. Sandel?

MR. SANDEL: No. Thank you.

MR. PUMPHREY: Mr. Dyas?

MR. DYAS: Yes. Thank you.

I agree with Mr. Sandel. We should be very reluctant to raise allowable limits of TDS in groundwater 500 to 1000. I'd like to keep the water as low TDS as possible.

Also, I have a question about Slide 14. By the way,

these are great graphics in helping us understand the complex subject.

And what I'd like to know is for this particular example, what safeguards do we have that would prevent an individual discharger from consuming all of the remaining assimilative capacity per basin?

MR. PLAZIAK: All right. Well, for a basin, I'm going to -- I'm -- let's put this in perspective because I think that, you know, when we talk about basins, we're talking large areas. In this case, in this analysis, we found that the assimilative capacity was going to be 3.5 millgram per liter per nitrate within a half a mile of the discharge. So that's a localized discharge and localized degradation in the basin, which is, you know, quite expansive when we look at it.

This shows the -- the -- essentially, this is your -- the sweet zone, the sweet spot, as people refer to it in our watershed where it's the watershed -- where the water's coming from, the headwaters up at Lake Arrowhead down into Hesperia. Very, very good quality water. So this discharge here is only going to affect a very small part of that whole basin.

But to answer your question about how do we ensure that is -- that is, in fact, what's going to happen, that's where the monitoring requirements that we put into that WDR will ensure that we'll be able to see that they are, in fact, complying with that.

MR. DYAS: What -- what I'm really concerned about is allowing what's remaining of the assimilative capacity to be taken up by one discharger. In other words, when we have multiple dischargers in a region -- the basin, sub-basin -- to be equitable, should we consider developing a TMDL for salts?

MR. PLAZIAK: Yeah, probably. We -- we need to be looking at site specific water quality objectives, I think.

MS. NIEMEYER: Well, the Salt/Nutrient Management Plan in part are addressing some of those issues because you're looking at not only an individual discharger and not only discharging their waste but also activities on the land too.

MR. DYAS: Uh-huh.

MS. NIEMEYER: So you're trying to account for all of those things. So it is kind of like a TMDL for salts.

MR. DYAS: Okay. Thank you.

MR. PUMPHREY: Dr. Horne?

DR. HORNE: I was afraid you were going to say that. I have random disjointed thoughts. I'm just going to say them as they come to me.

First of all, I want to say I completely agree with Mr. Sandel's comment about once the groundwater basin is above 500 TDS, that it's, I think, wrong thinking to allow the groundwater basin to go up to the next level. I think that trying to keep those levels as low as possible is a better policy.

On Slide No. 8 -- could we go there? And before I go on with my comments, I also want to say I agree with Mr. Sandel's comment about looking at what other districts are doing in terms of comp -- what their comparable rates are. I'm intrigued by his comment about improving drinking water. It's an interesting idea. And I was also -- had the same question that Mr. Dyas had about when there's multiple dischargers in the same basin.

But as to this slide, my -- I'm curious when you do this analysis, how -- are you talking to what people are doing in other regions, or is there guidance from the State Board? I mean -- or -- or do you make it up as you go?

MR. PLAZIAK: She's on to me now.

No. Well -- all right. As far as the antidegradation analyses go?

DR. HORNE: Yes.

MR. PLAZIAK: All right.

DR. HORNE: I mean in terms of, you know, how you -- how you think through this. Is there -- is it -- is this the Victorville office's approach, or are you also looking at what they're doing in Santa Ana? Or --

MR. PLAZIAK: Well, we're on the back stoop with some cigars thinking about it. Actually, what we did -- in a serious way -- we've -- and the guidance is out there. Just to let you know, the State Board actually has formed a working

group to look into 68-16 and to see if there's some changes that can be made or revisions or if some clarification can be provided to the regulated community.

So that's ongoing, and I think they've already had a couple listening session, and I think there's another one in a couple of weeks.

DR. HORNE: That's great.

MR. PLAZIAK: That is great because the guidance that we do have, we have the Atwater memo. There was an Office of Chief Council that came out in 1987.

DR. HORNE: Right.

MR. PLAZIAK: That's one. And then after that we had the Administrative Procedures Update, APU 90-004. That was another thing that provided us a little bit more guidance on when is an antidegradation analysis really required and what should go in it.

And then in 1995, February of '95, the State Board put out a question-and-answer memo that kind of explained 68-16. So those are the three documents that we rely on within the State.

And the -- the Federal Government also has it in 40CFR. I think it's Section 131. So those are references for us to go to. And the fact that I can tell you those number, I would tell you staff, I know, has referred to those and will continue to do that to understand what needs to happen.

But we do need some -- some clarity in some of the things that we're -- you know, 68-16 -- just like some of the definitions I went through before. What is a -- you know, best interest of the people of the state that maximum benefit the people of the state? That -- that does need a little bit of clarification. Even more specificity to help us with those kinds of analyses. Because we can -- we can do in the simple antidegradation analysis, we can do that all day long. We can look at the environmental factors. We can look at the beneficial uses.

I mean you start going to the complex or detailed analysis, that's when you're -- you're looking at not only the treatment, the best practicable treatment and control, but you're looking at those socio-economic factors. That's the challenge for us.

DR. HORNE: And another quick question about this slide. Does the analysis -- does your analysis change depending on whether the water basin is adjudicated or not? How does that affect your analysis?

MR. PLAZIAK: Not really. I mean we're -- you know, the antidegradation anal -- antidegradation analysis is constituent specific. We're looking at each of those constituents. We're looking at the basin -- or Basin Plan's beneficial uses and we're -- we're looking at those in context to each other to see what's the threat to the beneficial uses. So whether it's

adjudicated or not -- I mean I think it will have an impact tangentially, but not in the direct analysis on discharge.

DR. HORNE: Okay. Next slide would be No. 13.

Okay. My brain works in terms of time, I'm afraid. So what time frame are we talking about? Are we talking -- 20 years? a hundred years? -- in terms of -- or maybe we should go to the next slide after that. Maybe my question will be clearer with 14.

MR. PLAZIAK: Well, yeah, in this case -- and then -- Jay Cass, you can correct me if I'm wrong. There you are. I mean, that's -- that is the predicted water quality after the discharge in that aquifer. So --

DR. HORNE: Over what time period?

MR. PLAZIAK: Well, I -- I would -- I -- I can't tell you if it's months or years, but I think it's -- it's not decades. We're expecting once the water starts to go in -- into the (inaudible), that we're going to see this type of degradation. Now, we're looking out to the half mile in a month? a week? a year? I -- I can't tell you that. But the time scale is not the decadal. It's probably on the order of -- of years based on the aquifer characteristics. Some aquifers have good transmissivity. So it might happen quicker. Others aquifers, not so much.

Is that --

DR. HORNE: Mr. Cass is sitting behind you.

MR. PLAZIAK: Snuck in behind me.

Is that --

MR. CASS: Mike, if I could add to that, in doing this analysis, we're looking at the discharge. So as long as there is a discharge, that would be the degree of degradation. If the discharge -- I guess two things. When would we go from ground zero baseline up to that level of degradation? We don't factor that very well because using the models we have, they're a mixing model that assumes a more uniform discharge than will really occur.

And, secondly, if the discharge was stopped --

DR. HORNE: Uniform in time or uniform in space?

MR. CASS: Typically, a mixing model is set up to be more of an instantaneous mixing model. That's just a computer model where it looks at what's coming in naturally, what might be coming in from the discharge, and what would the net effect be? So there's not really a -- temporal element in that consideration.

And then, of course, if the discharge were to stop, how long would the degradation remain? We don't have a good handle on that because for our wastewater plants, typically we assume that we're going to be continuing that discharge for a long time.

DR. HORNE: I guess I'm confused because -- I mean -- all right -- these are for -- these two enclosures were for

treatment plants; right?

MR. PLAZIAK: Yes. Well, they're for sub-regional plants.

DR. HORNE: Plants. Which are --

MR. PLAZIAK: Yeah.

DR. HORNE: -- operating over some period of time.

MR. PLAZIAK: They are going to operate over a period of time. I can't really tell you, though, if it's going to be, like I said, one or two years. There's a -- and we could -- if you'd like the details, we can probably get back with you on it, but --

DR. HORNE: I think (inaudible).

MR. PLAZIAK: I think your comment, though, is kind of in general.

MS. KEMPER: No. She's talking about the sub-regional -- I just want to -- I think what -- I think I can help this because I can see Amy's brain taxing over this because in general, you're right about wastewater. That's what Jay's talking about. You know, every day people flush. The flows don't change that much.

These two examples that Mike has shared with the sub-regionals, the plants are there. They're going to treat a set volume of water every day. You know, million gallons per day. That's what they're designed to treat. That's what they're going to treat. And a million gallons are going to come into that plant. A million gallons are going to leave. But when it

leaves the plant, it's supposed to go in a purple pipe and be used for water recycling. Okay?

DR HORNE: Except it's not.

MS. KEMPER: Well, except the plants don't exist yet and no one is using the water. But the day those plants begin operating, the hope is there are people who will be using that water than not.

So the point -- the point -- this is a different scenario. Okay? So when we talk about the modeling and the temporal nature, is that on a day-to-day basis, the plant is going to produce a million gallons per day. On a day-to-day basis, different amounts are going to get used on plant and the remainder is going to get percolated in these ponds. So the modeling that was done assumed that the whole million gallons per day would percolate into the groundwater every day for the next 35 years. Okay? So that --

DR. HORNE: Oh, 35 years. (Inaudible.)

MS. KEMPER: Okay. Okay. So let's just say -- the point being that the modeling just looks at it like it's operating every day that way. Every single day, 365 days a year. But the reality, we hope, is going to be that there's only going to be a few months out of the year where stuff is percolating or maybe portions of that million gallons.

So that's why -- that's why you're getting -- you know, that's why you're a little confused in terms of what's

going on because it's confusing. And none of us know what's really going to happen. This is the worst case. We permitted it knowing that if they had no users of this water, this water could be percolated and would have this kind of impact at that location on an ongoing basis. So that's the --

DR. HORNE: I mean 35 years I think was the answer I was looking for. You did make it up?

MS. KEMPER: Well, Amy, it's not based on a period of time.

DR. HORNE: Well, I don't understand. It's a facility that's supposed -- that's built to run for a certain period of time.

MS. KEMPER: Right. And most plants are built for that type of lifespan, and they may continue to run for 50 to a hundred years with some additional engineering improvements along the way. So that's just a typical engineering assumption, 35 years. Okay?

DR. HORNE: I -- I don't understand --

MS. KEMPER: The point being that the modeling is that the groundwater continues to be replenished. So that analysis of degradation going for about a half a mile away from the plant is based on the fact that there's water there.

It's just like a river. You know, it's different than a river, but it's just like at a surface water where you're going to have an ongoing discharge, and there's an

assumption that there's going to continue to be fresh water mixing with that. And so, in other words, the pollution at the site of the degradation should not get worse over time because of dilution within the aquifer, within the groundwater basin.

So even though, yes, there is an ongoing load of salt, it's not really going to be measureable. And maybe over hundreds of years, you would see a long-term, you know, maybe extension of degradation. But the modeling looks the same over a pretty short time frame --

DR. HORNE: Define the second law of thermodynamics (inaudible).

MS. KEMPER: -- not a geologic time frame.

MR. PLAZIAK: This is why it is important, though. On the -- on the opposite end of this is that we do have good monitoring, not just what you're going to see at the plant itself, but that network that I was talking about that other agencies are working through.

And we're looking at the basin in general just like the Stella Model is looking at with Mojave Water Agency's different sub-basins to see whether or not some of those colors are starting to change, you know. And -- and -- and they're taking into account the large inputs into those basins. In fact, I think these -- these plants are incorporated into those model calculations.

DR. HORNE: Okay. I think we've covered some of my other

concerns. Again, the issue about the TDS above 500, I mean I think we have to think bigger than impacts on human health. We have to think in terms of opportunity costs in other economic activities that might go on in these areas if the good high water quality is maintained.

And I know that that sounds very hypothetical, but, I mean, maybe there's some crops that could be grown if it stays below 500 but not if it goes above. Maybe there's high-tech engineering plants that can be built here if it stays below 500 but not if it goes above. I mean it's -- there -- there are other -- there are other economic factors and opportunities.

Humans are -- I'll get on my soapbox now. Humans are -- are -- are very inventive people -- people -- species and as long as we -- as long as we don't -- as long as there is a resource here that can be used, people will figure out a way to use it.

MR. PLAZIAK: Uh-huh.

DR. HORNE: The problem is when the resource becomes unusable as in Easter Island in the book "Collapse," if anybody read it. So I mean that's -- I think my concern is, you know, maintaining the water quality at a level but that keeps options open in the future for different types of economic activities than what we are seeing here at this minute.

I'm sure the -- in economics we always talked about buggy whips manufacturers. They're the -- what we always hold

up. And I'm sure the buggy whip manufacturers were pretty upset when buggy whips were going out of business, but, you know, they moved on. They found something else to do, hopefully.

Okay. What else do I have to say?

Okay. When it comes to -- I'm -- I'm looking now at Slide No. 20. With these public interest factors -- and I appreciate the difficulty in looking at -- at these kinds of issues. I thought it was very useful the way -- when we were looking at the TMDL for Tahoe, that the scientists -- the UC Davis scientists coded everything in terms of the degree of confidence they had about the number.

So there was some numbers -- and a lot -- a lot of the numbers you're dealing with are numbers that come out of models and so the same was true for them. But they -- they color coded them depending on whether they were really confident or not about the numbers that they had. And -- and I think it might be helpful to go through that kind of exercise with -- with -- when you're looking at this kind of antidegradation. I mean you are going to find that you have the greatest confidence around the numbers that you derive in your area of specialization. Right?

I worked a lot of the economic kinds of numbers, and I don't particularly have a lot of confidence in those numbers because, as I just said, people are very creative and

innovative and come up with new technologies, new products, new processes that we don't even know about right now and that make the future different than what we see.

And a lot of these economic analyses tools are very static, and I'm not sure that it's -- you know, I appreciate your wanting to have more help on that area. I'm not sure you would -- the information you would get would be more reliable without -- I mean I'm not sure it's worth the effort really to put a lot of money into that. And really it might be better to really work hard on the areas where you have expertise and then, you know, find some other -- some other ways to address -- are you required to do an economic analysis? Is that --

MR. PLAZIAK: In a complex --

DR. HORNE: Yes.

MR. PLAZIAK: -- analysis, yes.

DR. HORNE: You are?

MR. PLAZIAK: Uh-huh.

MS. NIEMEYER: I would also just point out like in -- in waste discharge requirements, we're required to consider economic considerations.

DR. HORNE: Yeah.

MS. NIEMEYER: But -- so it doesn't necessarily mean a -- an -- you know, an analysis, but it's a general requirement. But we have to have some way of considering those issues

especially if we're getting evidence from the discharger that's giving us numbers and giving us impacts related to what -- what we're requiring. We have to at least a way to truth it.

DR. HORNE: Right. Well, I mean so one interesting exercise that maybe some master student would like to do is to do a retroactive study when people have come in and said, "This is going to have this kind of economic impact," and to see whether it really did.

I mean now you begin to see the problem with economic analyses; right? I mean it's -- this requires more thought, obviously. But it's -- I -- I just hesitate to encourage you to put a lot of energy in -- in, you know, in -- down that route without thinking more carefully about exactly what we would get for that. Okay.

MR. PLAZIAK: I think I can actually answer a question you had earlier -- at least one of -- just -- we'll use a dairy analogy for this. And this is about -- this not a discharge permit that we're issuing. This is about where do we go with cleanup and what we're requiring through enforcement actions, which we're dealing with the dairies.

But in the case of some of the dairies where we've got water quality that's up in the two thousands, three thousands -- right? -- what we're currently working on for our dairy strategy is source control. And by that I mean we're working through applying those -- the wastewater, wash water --

to the crops at agronomic rates. That's a disposal technique. That's what they're using.

In cases, though, where they don't have enough aridable land, they've got to use surface impoundments or something that will prevent that water from percolating. That's a strategy that we're approaching right now so that eventually over time as we apply source control, we should see the concentrations drop not just below 1500, but the goal would be to be below a thousand. Ultimately, we'd like to see it even lower than that.

But we've got to -- you know, we've got to look at the practicality of where can -- where can we get that number? That number hasn't been developed yet. We're just working on source control. But I can tell you that we are working through this, and we are cognizant of the fact that we -- we don't want to just derive a solution that gets us right at the line at 1500 or at any other MCL.

We've got to go, obviously, in context to 68-16. What's the best interest of the people of the state and how do we maintain the highest water quality. That is -- that is an example of what we're doing in terms of the dairies.

MR. PUMPHREY: Mr. Jardine, questions or comments?

MR. JARDINE: Just a few brief comments. I do agree with Mr. Sandel regarding maintaining of 500 TDS. And also I share with Mr. Dyas the multiple dischargers, though we may have many

in the basin. And I'll keep it short and simple. Thank you.

MR. PUMPHREY: Ms. Cox?

MS. COX: Thank you.

Well, I think all the -- the comments prior to mine help amplify what an exceptionally complex discussion this is and truly can't be solved in a short dialogue. I think it's important to note when assimilative capacity is discussed, that it's in a localized context and on a case-by-case basis, that assimilative capacity is going to vary from project to project particularly depending upon the geology and the hydrogeology of the area.

It's good to note on that one Slide No. 14 that that is indeed a worst-case scenario. I was wondering that when you showed it of how that was determined to be the case. And it's good to know that in all probability the end result will be significantly better than that.

I do know that using my -- my body of expertise, which is this watershed area and it's an adjudicated basin, that most of the municipalities have been very impressive in putting in purple pipe so that when these sub-regionals do get filled, they will truly go to beneficial use.

I think it's also important to note that, you know, we're dealing with the MCLs, a maximum contaminate level for nitrates as well the secondary maximum contaminate level which only deals with aesthetics -- you know, smell, odor, visible

occlusions in the water -- whereas the MCLs deal with health risk. And these, of course, are established by EPA and Cal/EPA.

So there is already standards in place that all of the water purveyors must deal with, and there's I think a -- a broad understanding of the effects of these different constituents. So I think there's a great deal of buy-in by the stakeholders to embrace the objectives that are looking to be achieved. And I think truly the beneficial uses will vary just as the assimilative capacity will by region.

In our region down here, we get five inches of rainfall per year. So any amount of water, even if it is slightly degraded, even if it has TDS, is appreciated and better than no water at all. There have been arid regions in our area -- thinking of the eastern desert -- that have actually undergone moratoriums because of the lack of water resources. So there is truly an understanding in the southern Mohaten (phonetic) region of the value of water.

There is also, I believe, and acceptance of slightly degraded groundwater quality or even discharge from wastewater facilities with the understanding that the beautiful aquifers that we have here will purify the water and as they are pumped out to be delivered by the purveyors, the purveyors then will adhere to the water quality requirements that have been issued by EPA and CAL/EPA as far as the MCLs and the SMCLs. So I know

in our region, it is truly a water cycle. It is used. It is recharged. It is purified by the aquifer, and it is used again.

So I think understanding the vast differences in the region within Mohaten that I think more work is definitely needed. I think stakeholder input -- because when you look at the extreme diversity in this region, there are truly different needs, different desires, a willingness to accept some water quality changes in some areas versus the -- the desire to embrace only pristine and nondegradated water supplies.

I just think a further -- further dialogue for all of us is certainly a good thing for us to look at in the future because it all has economic impacts however you look at it.

Thank you.

MR. PUMPHREY: I just had a couple quick things. I kind of shared Mr. Dyas's concern about the wiggle room in the assimilative capacity. And -- and I sort of -- I'm --I'm kind of reassured by the fact that -- or the notion that these are -- are localized or could be considered in many cases to be somewhat localized impacts.

But on the other hand, when I see the phrase, "known or" -- I'm concerned about, I guess, the -- the sense in which you think that all of the impacts to assimilative capacity are actually known. Because if you think that the -- the pond contains -- is this big but there are impacts to that -- to

that volume that are not known, they you're -- you're -- you're -- you may be pushing the available capacity closer than -- than people might realize.

So I'm -- I would hope that at least as we look at these on a case-to-case basis, that some consideration is given as to the certainty that you have that all of the known impacts -- or all of the impacts are known and there might not be something lurking out there.

The other -- the other question I had was the comment was made that, you know, the groundwater is going to continue to be replenished. That may or may not be true to the same extent as has been the case historically. And so I would imagine that your analysis would have to take into consideration what kind of changes in the availability of replenishment may be -- may accompany climate change or different hydrology cycles or things of that nature.

Lastly, I -- I would -- I -- I understand Dr. Horne's concern about the economic analysis and the ability of people to -- to do it. The problem that I have is that the economic analysis is usually the analysis that the -- the proposed discharger falls back on to say, you know, yeah, we're going to have consequences here but they certainly should be allowable because the world is going to end unless we're allowed to go forward, in the worst-case scenario. So I -- we're -- we are obligated to -- to deal with that.

And in order to protect the analysis of the other factors, we have to be able to make a robust analysis of those arguments if only to make a -- a -- a -- a solid record for our own decisions. So I -- I appreciate the fact that obviously resources may be needed to help do that.

And so my last question was going to be other than looking straight at the State Board member and saying, "Resources are going to be needed to help us to accomplish that," is there anything else that the Board can do or that you would recommend that the Board consider doing in order to make this task more manageable or to help you secure the resources that are needed to do it?

MR. PLAZIAK: It just started. You -- you just -- all of you just gave staff some guidance whether it was, you know, direct, but you gave us a perspective on how you see things. I hope this isn't the last time we have this dialogue.

I think this has been helpful for staff. So that helps us to understand where you kind of see the lines being drawn so that we can better inform the dischargers what's going to work and what's not going to work. What's going to be acceptable, in other words, to the Board in your proposed discharge and what's not. Those things are -- are -- they're priceless for staff to have that kind of perspective so that we can -- we can navigate much more efficiently and faster and more accurately with the discharger.

As far as the economic piece, I don't know what the Board can do in that realm. I mean other than lobby for us in other places higher up to say, you know, those -- that is -- that's -- that's a gap that we have. It's a skillset that -- that needs to be there. It's not in our current (inaudible) organization, at least not at the regional boards. So we should look at some ways that we can solve that data gap or that skillset gap.

MR. PUMPHREY: Thank you very much. This has really been fascinating.

MR. PLAZIAK: Thank you.

MR. PUMPHREY: It's been really informative to us, and I appreciate the effort going into it. Thank you.

MS. KOUYOUMDJIAN: (Inaudible.)

MR. PUMPHREY: Yes. Please do.

MS. KOUYOUMDJIAN: I just wanted to say again, same as Mike so eloquently said, our thanks to the Board for (inaudible) our staff this guidance. This really is very valuable to us as we move forward as these permits come before us. And, again, as Mike said, we'll be back for more of this.

It also helped inform us as we -- as we participate in a state-wide discussions on antidegradation policy to better understand what is important to the Regional Board and your thoughts and guidance as we move forward on that.

And, lastly, on the economic analysis, it is a

struggle. I know all state agencies, particularly environmental agencies are struggling with this issue because more and more are being asked to do this when we consider regulatory actions.

The Air Board, probably the most, has been asked this question because there's no perfect economic model. They're very difficult. And they do not consider the avoided costs or the benefits to the public health from having drink -- clean drinking water, less visits to the hospitals, other things like this that are not quantified in economic analyses but equally as important for us.

So it is something we're struggling with and I, again, thank the Board for this guidance for us as we move forward to help see if we can effectuate some of these changes.

MR. PUMPHREY: Thank you. That's our last agenda item for this portion of the meeting.

(Conclusion of Recorded Material.)

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