

CHAIRMAN JIM BARRY: We have announcements. I'm going to start. Nicole Fyffe and her husband, Shawn, had a baby Sunday night, Kesslyn (ph.), six pounds, 12 ounces, so we will not see her anymore, but she's not going to miss us.

Staff, you got announcements?

MELANEY SEACAT: So, good evening, Committee members. On your - in front of you there's a handout, Tucson Environmental Water Banking Through Conservation Program, and I handed this out on behalf of the Water Resources Research Center; they were going to give a presentation tonight, but our Agenda just got way too full, so this is information that is related to the paper on water needs for the environment.

Also, Madeline Kiser - I'll put this on the website or send it out to you - but she wanted us to announce that there's an upcoming Southwest Summit on the Environment; it's going to be held Thursday, October 8th, from 8:00 to 4:00, at the Walter Cronkite School of Journalism at Arizona State University, and it's for ethnic media leaders, practitioners and environmental experts and activists to build coverage and ethnic media of water, land, air issues in the southwest and to expand the communication strategies of environmental groups working on these issues.

Last, but not least, we're going to be talking about the Agenda - I mean the schedule later on in the Agenda, but I did want to let everybody know that the

next four meetings are going to be held at the City of Tucson's IT building which is right next - just south of the Manning House downtown, if you know where the CWAC meetings used to be held.

CHAIRMAN JIM BARRY: Okay. One last thing from me. We - Staff has drafted a response to the letter we got from Cliff Neal of Central - the Groundwater Replenishment District, and it's my thought that I'll just draft a letter to send that back to them, but we'll send it out to the Committee. We'll make the Staff response part of the public record, and if the Committee wants to add anything to what Staff says, we'll make that part of the public record as well, okay? So you'll send that out tomorrow? The Staff response and . . . all right.

Approval of the August 20th minute - minutes. Do I hear a motion?

ROB KULAKOFSKY: I'd like to amend it. There's a -

CHAIRMAN JIM BARRY: Go ahead.

ROB KULAKOFSKY: There was a comment that I made - and I can't find the darn thing . . . but, actually, I - I asked for the paper to actually be - to be stricken from the record, and I want that in the record that I asked for it be stricken from the record on economic costs, water.

CHAIRMAN JIM BARRY: Okay.

ROB KULAKOFSKY: Thank you.

CHAIRMAN JIM BARRY: With that amendment, do we have a motion?

ROB KULAKOFSKY: So moved.

CHAIRMAN JIM BARRY: Do we have a second?

MARK STRATTON: Second.

CHAIRMAN JIM BARRY: Any objections?

(No response.)

CHAIRMAN JIM BARRY: Okay. Done.

Call to the Audience?

(No response.)

CHAIRMAN JIM BARRY: Okay. Follow up on Costs of Growth and Water as an Economic Resource papers.

NICOLE EWING-GAVIN: I'm handing around the follow-up document from the Cost of Growth paper from last time, and it's very short; this was the last paper we discussed and so there's really only one comment/recommendation theme. I know I almost didn't even do the paper, but it was just related to the wastewater treatment plant needing to be - needing to be located on the southeast side. The other questions that the Committee had asked were responded to at the meeting, so that's why they're not listed here.

CHAIRMAN JIM BARRY: Is everybody happy with this follow-up? Any comments?

(No response.)

CHAIRMAN JIM BARRY: Okay. Could you - could you -

BOB COOK: I'm sorry I'm late. What was the item and what was the question?

CHAIRMAN JIM BARRY: It was the follow-up of the Cost of Growth and Water as a Economic Resource papers and this -

BOB COOK: Okay.

CHAIRMAN JIM BARRY: - is what they handed out.

BOB COOK: Okay.

CHAIRMAN JIM BARRY: Okay. Item Number 6, Phase 2 Report Writing Follow-up Discussion. Pass this out. I would like to - we - Marcelino and I sent out an email acknowledging that - my brilliant idea of everybody filling out questionnaires fell flat on its face, so we withdrew that idea, but that left us with - with another approach that - that is a combination of Staff - Marcelino and I talking with Staff.

One is that - is that part of the report will be a Staff report. Now that they have presented all these papers and listened to all of our comments, how do

they look at their recommendations and how do they prioritize 'em and sort 'em out, and what is their kind of overall theme? And then we'll write a report that's our report and we put that into the scope; it's our own report and we'll talk about what - what that means.

We - Marcelino and I sent that out and we got two comments back; one from John Carlson, which was, "Go ahead, it sounds great." And the other was from - from Rob that had some more detailed ideas that looked to me like - like motions and so I want Rob to - to discuss that and - and then we'll get to the Staff report. So discuss where - where you're at and what kind of motions to you want to make, Rob.

ROB KULAKOFSKY: Well, one of the - one of the comments was that the White Papers were all done either by Staff or by outside experts, and that is what we were led to believe in Phase 1. Thank you. I really don't have any problem with members from the public or members of the Committee to add in comments, and I think that's appropriate and the more information and ideas and opinions we get, I think the better. But to have the White Papers include things that are not done by experts, I think dilutes the work that Staff did and the outside experts.

One of the - one of the things that was submitted by our Chairperson, who I respect, but respectfully you're not an expert on population and, you know, the

S-curve - I guess you could call it the S-Curve paper - and it was very well-written and very well thought out - but I - I don't think we should be portraying that as being done by experts, an expert, because, once again, the other reports then may be - look more like they're done by experts and that they're not as significant.

And also the paper on the Economic Value of Water, Mr. Ron Shoopman said we're not economic experts, we're business people. Well, okay, that's not the paper that was done by experts, so I don't really think that should be included as a White Paper; as a paper that was submitted, fine, I have no problem with that; but I think portraying these things as something that they aren't and I think it dilutes all the rest of the work that was done.

CHAIRMAN JIM BARRY: In - in your email you talked about that paper, and maybe even my very fine paper, as being stricken from the paper, and I just got to tell you I got a problem with that.

ROB KULAKOFSKY: Well, I don't - see, I think it should be stricken from being one of the White Papers. If you - there should be separation between what was presented by Staff and/or experts and then what else was presented.

CHAIRMAN JIM BARRY: Well, I - I have - personally would have no problem with - with recategorizing what the papers are, but, I mean, you've got the TV camera that's recorded that presentation and mine. We've got minutes that

reflected those things that are on there; I mean, it's part of the record. I don't see how we can strike it, but we can recategorize what - what -

ROB KULAKOFSKY: Well, that's fine -

CHAIRMAN JIM BARRY: - those White Papers . . .

ROB KULAKOFSKY: - that's fine. I just think that it's misrepresented as something that it's not and I think that it could add to confusion.

CHAIRMAN JIM BARRY: Bob, did you want to say something?

BOB COOK: Yeah, I have a general comment about the White Papers and it's this and how they fit into the Committee's work. The basic problem, I believe, is that there was really no consultation with the Committee about the scope and the - the - the key questions that were going to be addressed in each of the technical papers.

We've - let me just enumerate some of the - some of the comments on - on the technical papers. The one on location of growth. While the paper cited Smart Growth factors as being important, and - and did some analysis on that, there was fundamentally no basic comparison between business as usual and Smart Growth; that would've been very informative. Had we had a chance to - had a comment -

CHAIRMAN JIM BARRY: Bob, let me interrupt, let me interrupt.

BOB COOK: The issue on the table is - is Rob's point about either recategorizing it or striking it. What you - we're going to get into those kinds of discussions in the next four meetings. I don't think that what you're bringing up is germane to what Rob's talking about, okay? I mean, you've got your opinion on the paper; that's - that's going to be talked about in the next four meetings; it's not germane tonight. All right? So, let's get back to what Rob is trying to say. Is everybody agreed that we ought to recategorize? John?

JOHN CARLSON: Well, that sounds like the way to go but, you know, you almost need to have some definition for us ignorant ones. I don't know what a White Paper is versus an expert versus an outside paper. I - they're just presented, we know who gave 'em, we have an ability to put certain weight on 'em or believe 'em or not believe 'em or half believe 'em, but recategorize kinda - it sounds like a good way to do it, but let's not get too technical on who gave it and what we call it.

CHAIRMAN JIM BARRY: Okay. Any other comment? Mark and then Bob.

MARK STRATTON: Yeah, I - I guess I don't really have too much of a problem either way, but as long as the papers are identified who - by who it is that wrote it so that anyone looking can - can determine on their own whether or not they believe this person's an expert or if he's just providing their own thoughts.

CHAIRMAN JIM BARRY: Bob, do you have another point?

BOB COOK: Yeah, I - I think the reason I - I said what I - I was beginning to say - and it would've been a longer response, obviously - goes to the point of really how are we going to characterize these White Papers in terms of the total package that we're going to deliver? And there's an aura of expertise with a - with a White Paper, a technical paper, and I think that, you know, each of the - each of the technical papers were missed opportunities in important ways. And, you know, as a citizens' committee, we're here, really, to - to - to take - to gather information, to analyze information and make judgments, and I think that that is what we need to claim here and we need to frame these - these technical papers in that light.

CHAIRMAN JIM BARRY: Let me dispute a point you made. I remember that Marcelino and I brought ideas for Phase 2 to this Committee in October and November and December, and we talked about the issues that would be talked about and asked for approval, and the Committee didn't have a lot of discussion, but the Committee did approve the general approach to having these papers.

I think that we've - I think that there's - there's two things we have to keep in mind: I believe that Staff believes these are good papers and Staff is going to respond to and write their report about the papers. They've accepted the papers.

If - if we want, at this late date, to entertain a motion to start discarding papers, well, I guess we have that - that right, but I'll vehemently vote - argue and vote against that - that kind of a motion.

JOHN CARLSON: I'm with you.

CHAIRMAN JIM BARRY: Vince?

VINCE VASQUEZ: Yeah, I - I think that - I mean, our work product is - is this, you know, what we're going to have this facilitated process to do. And however we collectively view the collective body of work is going to come out through that process, and so to - to black-list certain, you know - certain - or recategorize certain papers, I think that'll come out in the collective process as we kinda chomp on the individual ideas that were represented in - in each of the papers. And it just doesn't seem true to the process to - to dismiss any concept that was presented out of hand until it's really been thoroughly debated in the context of this final paper through a facilitated process; to give it all a good opportunity to be thought through as a Committee.

ROB KULAKOFSKY: Well, let me just say that -

CHAIRMAN JIM BARRY: Rob?

ROB KULAKOFSKY: - when - when there was this request for proposals for a mediator, it - the - all of the White Papers, including Jim's paper,

were represented as being technical papers by - written by Staff or outside experts. My problem is the outside experts and I - I think what we're - by saying that they're done by outside experts, and if they're not, then we're misrepresenting what they are; they are what they are, but they're not done by outside experts. And so all I think we should do is recategorize those as submitted papers, but . . .

VINCE VASQUEZ: I would - I would just encourage any of us that if you - if you take exception to anything that's in the papers in terms of whoever it came from, you know, if there's - I would - I would research it personally and I would - and I would refute it with, you know, opposite evidence in - in the literature, in - in opposing research, but just to dismiss it out of hand just because of who it came from doesn't seem like an appropriate starting place for a good discussion on - on cultural values on water, which is kind of one of - the value of the discussion is one of the big pieces of this. And so, regardless of where that information came from, it doesn't seem to be, you know, pertinent to our collective conversation and - and - I mean, I guess from -

ROB KULAKOFSKY: But then should I - should I say that the - the papers that I - I suggested people look at as far as the ethics of water, maybe I should then say that should be added into the record as a tech- - three technical papers, you know. You get to a certain point where, I mean, either it is or it isn't and

those were not papers done by experts, and that's all I'm saying is that we shouldn't be calling them something that they're not. I think it dilutes all of the effort and it dilutes anything we have to say about it.

VINCE VASQUEZ: I - I guess I just - my last statement and then I'll, you know, leave it alone is just that I would - I would - you know, challenge you to go - to go into the papers that you find exception with, find the positions that you find exception with, go into the literature in that field and refute it if you do not feel it is truly expert - expert opinion, expert brand of - of work in the given field, in the given literature that it comes from.

ROB KULAKOFSKY: Well, you know, Jim's paper I have no problem with anything he had to say in it. Jim's a nice guy, he's just not an expert and I don't think that we should be portraying that paper as being written by an expert; that's all I have to say.

CHAIRMAN JIM BARRY: Well, I - I actually submitted that just so that we would have something to talk about rather than considering it a White Paper, and I have no problem with categorizing that as just a paper - communication with the Committee to sponsor discussion, and I've got some slides tonight to remind us of what we talked about, but those are all part of the record. I have no problem with - with our trying to recategorize these things. I do have a problem with trying to - to

suggest that we are taking out the term - that we are trying to come up with a classification system that - that unfairly diminishes the importance of the contribution. Maybe we should just talk about 13 if that's the number. Is that the - if you take mine out, is it 13?

NICOLE EWING-GAVIN: Yeah.

CHAIRMAN JIM BARRY: Why don't we just talk about 13 -

ROB KULAKOFSKY: Twelve.

CHAIRMAN JIM BARRY: - papers that - why 12?

ROB KULAKOFSKY: Twelve.

CHAIRMAN JIM BARRY: Why 12?

ROB KULAKOFSKY: The economics of water was not done by experts.

CHAIRMAN JIM BARRY: I am saying . . .

ROB KULAKOFSKY: It was a submitted paper; it's -

CHAIRMAN JIM BARRY: Yes -

ROB KULAKOFSKY: - and presented -

CHAIRMAN JIM BARRY: - 13 papers -

ROB KULAKOFSKY: - paper, but it's not done by . . .

CHAIRMAN JIM BARRY: - 13 papers is how - papers submitted to the

Committee for their consideration. Don't talk about Staff, don't talk about outside experts, because the fact is we got 13 presentations; it's on the record.

ROB KULAKOFSKY: Okay. But don't - yeah, as long...

CHAIRMAN JIM BARRY: That's fine. If you want to get out - I didn't come up with that classification -

ROB KULAKOFSKY: Okay.

CHAIRMAN JIM BARRY: - so I have no problem with it as long as we are not trying to suggest that we are coming up with a way of undercutting the paper that - that Ron Shoopman's people submitted. I - I'm against censorship. I mean, even if I don't like ideas I think we got to fairly treat them.

JOHN CARLSON: (Inaudible) enhance something that shouldn't be enhanced. I mean, I think your point - if I gathered it right - is these are papers, here's who wrote 'em, we looked at 'em, you make up your mind. We have our opinions and we've either contributed it or not. And, obviously, we got (inaudible) opinions and that's the way it should be. But I agree -

CHAIRMAN JIM BARRY: I can live with that.

JOHN CARLSON: - let's not try and wait - I hate - I don't even know what a White Paper is. I don't know what a technical paper is.

CHAIRMAN JIM BARRY: It's written on write paper.

JOHN CARLSON: That's why. Okay. Well . . .

CHAIRMAN JIM BARRY: You comfortable with that, Rob?

ROB KULAKOFSKY: Yeah, I'm comfortable with it, but I - I still think that we should have - if - if the Committee knew that outside people were going to be brought in to write - people who are not experts - to write papers and submit things to the Committee in Phase 2, I think we should've known that ahead of time so that we would've had an opportunity to hear a multitude of voices instead of hand-picked voices, and that's really what I - I object to the most; that . . .

CHAIRMAN JIM BARRY: Do you object to Val Little? You knew about her. She's an outside person.

ROB KULAKOFSKY: Oh, yeah, she's mean. But, no, it's - I - I think that we needed to know as a Committee that it was available for other people to make presentations and submit White Papers.

CHAIRMAN JIM BARRY: Well, it's clearly too late in the game to change that.

ROB KULAKOFSKY: Yeah, no, I . . .

CHAIRMAN JIM BARRY: If - if I screwed up, I apologize for that.

JOHN CARLSON: You did, don't worry about it.

CHAIRMAN JIM BARRY: Thanks, John. I - I propose that - that we

recategorize these as 13 papers, 13 contributions, 13 presentations to the - to the Committee. Now, did somebody - Marcelino?

MARCELINO FLORES: Well, just towards the end of Rob's comments, you know, again, we did talk about the scope of work for Phase 2 and we - we I think had also stated that, you know, there was going to be a distinction between Staff coming up with the papers and it would be - the onus would be on them, not necessarily on the Committee, and that we didn't really discuss any interaction or - or input into those papers as we wanted them to be from not us, so I - I guess, yeah, it's too late. We did want something to that effect in terms of the paper, but we didn't quite detail it as we may - maybe could have, but . . .

CHAIRMAN JIM BARRY: Mark?

MARK STRATTON: Yeah, and my thought is, you know, all these presentations were made before us. We had good dialogue and discussion on all of them. In my opinion, they all belong as part of the overall report because we did have discussion on all of them. In whatever form or format you want to put 'em in, I think they are part of the report.

CHAIRMAN JIM BARRY: Well, all of the presentations are - are *de facto*, part of the public record and will be published as such. What we say about them is what we're going to say about 'em; that's what we're going to do for

meetings over the next two months to try to figure out - okay - you comfortable with that, Rob?

ROB KULAKOFSKY: Fine.

CHAIRMAN JIM BARRY: Okay.

JOHN CARLSON: One - can I - we've been criticized that the whole community is not involved; they don't have a vote. And we've constantly said you can come and speak and we will print it and it'll be part of the record and that's the way I look at this. As long as you describe who the person is - well, you don't have to define 'em - whether they're an expert or not, we'll be here all night, who in the hell's an expert and not - but as long as they're identified as part of the record, that's - that's our clean bill of health as far as I'm concerned. We accepted everything from anybody at anytime, anywhere.

CHAIRMAN JIM BARRY: Okay. That being said, then, Melaney, why don't you describe what you have in mind for our facilitated process?

MELANEY SEACAT: I was going to talk first briefly about the schedule and then I'll go into the facilitator procurement process. So I handed out the schedule and what I'd like to do is have - this is an action item because we want to make sure that we're all confirmed for this. We do, as I said, the four meetings. The room's reserved. And so, according to this schedule, it's a very, very tight schedule,

and I just want to confirm that everybody's in agreement.

MARCELINO FLORES: What was the Google-thingy outcome?

MELANEY SEACAT: Yeah, there's a quorum for all of these.

CHAIRMAN JIM BARRY: All right. So we're talking about October 1st, October 15th, November 12th and November 19th. This is listed as an action item?

MELANEY SEACAT: Right.

CHAIRMAN JIM BARRY: Then I will move that - that the Committee agree to have those four meetings at the City's IT building, and the meetings going from 5:00 to 9:00.

MARK STRATTON: Second.

CHAIRMAN JIM BARRY: Any objection?

(No response.)

CHAIRMAN JIM BARRY: Done.

MELANEY SEACAT: Okay. Moving on to the facilitator procurement process. We at the County are proceeding down a professional services contract procurement process, and I was told by my procurement people that we're following the following procedures:

We sent out the RFQ, I guess it was last Monday or the Monday before last - no, it was last Monday - no, it was a week ago Thursday. And we - the

procedure calls that we set up some ranking criteria to review the proposals. They said that we should not submit to more than five - we actually sent out to six - in order for this process to go expeditiously, and that we then set up a ranking subcommittee, and that subcommittee can be made up of members of this Committee, but preferably no more than two members; at most, three members of this Committee - we can't have a quorum; otherwise, we have to go through a lot of open meeting law requirements - and two members from the City - one member from the City and County Staff.

So Nicole Gavin and I and Marcelino are already on the Committee. What needs to happen now is we need to have two additional members of this Committee, or at least one additional member I should say, volunteer to be on that subcommittee, and we have a meeting set up for Friday - tomorrow - at 10:00 a.m. to review the proposals. We got three proposals. Out of the six people that we sent the RFQ to, we got three back.

And the recommendation from the procurement people is that since we have Marcelino on the Committee and he's with the County Wastewater Committee, that we not select another person from that Committee, so sorry, Mark, sorry Rob. So that's the recommendation. We need to have some balance.

Last, but not least, from the point at which the Committee meets and

ranks the proposals, the other caveat that the - or stipulation that the procurement people told me about is that it needs to go straight from there to the procurement process, and we had originally wanted to bring that back to this Committee actually tonight to have this Committee bless the selection; but, in fact, the procurement process requires that a selection committee be the decision-maker on that.

So, what I want going to do is hand out the rating criteria and get input on that, and I'm happy to tell you who submitted if anybody wants to comment on that. But I'm going to pass out the rating criteria now but, as that's going around, is there anyone on this Committee that would like to serve on our selection committee?

MARK STRATTON: From that side of the room.

CHAIRMAN JIM BARRY: I'd like to nominate Vince and Bob Cook.

Do I hear a second on that?

ROB KULAKOFSKY: If - if they agree.

CHAIRMAN JIM BARRY: Second - there's a second.

ROB KULAKOFSKY: Will you go ahead and do it, Vince?

VINCE VASQUEZ: Yeah, I mean, tomorrow at 10:00 o'clock. Is that what I'm signing up for?

MELANEY SEACAT: That's right.

VINCE VASQUEZ: I'll talk at the - I mean, I'd like to be on the

committee. Tomorrow at 10:00 o'clock -

MELANEY SEACAT: We can accommodate the schedule.

CHAIRMAN JIM BARRY: Bob, you want to be on the committee?

BOB COOK: Yeah.

CHAIRMAN JIM BARRY: All right. We got a second to Vince and Bob. Any objections?

(No response.)

CHAIRMAN JIM BARRY: Done. Okay.

MARCELINO FLORES: Were we going to look at some input into the ranking criteria? Anyone interested in that?

CHAIRMAN JIM BARRY: I think that's what . . .

MARCELINO FLORES: Oh.

MELANEY SEACAT: Right. So I just handed out the ranking criteria and just is . . .

MARCELINO FLORES: On our side . . .

MELANEY SEACAT: Sorry about that. So this - we - Marcelino, Nicole and I have been talking about this and what we have here are three general categories: Qualifications and Experience, Approach and Price, and price doesn't have to be the most heavily weighted item, so we got the most heavily weighted

items being Qualifications and Experience and Approach, each with - for a total of 100 points to each of those; each have 40 points total, with Price representing 20% - I mean 20 points.

And within the Qualification and Experience, we have relevant education and training, experience facilitating groups, experience in quality of technical writing, ability to be perceived as neutral, ability to understand water and wastewater issues in the planning context, and relevant preferences - relevant references as being the specific rating criteria within that category.

In terms of Approach, just basically the soundness of the approach and if it's logical and clearly defined, and also that the task time lines, roles and objectives are clearly identified and feasible. And then Price, it's just obvious. Any comments on that?

MARK STRATTON: Just a question under process such as this, it would be considered as professional services, and my understanding under the statutes you can't ask for price on a professional services agreement.

MELANEY SEACAT: That's interesting because I had been told that as well but, when I talked to my procurement people, they say price has to be a component, so that's what I was told.

MARK STRATTON: On a professionals services agreement?

MELANEY SEACAT: That's what I was told. So there's a difference of opinion I guess.

UNIDENTIFIED MALE SPEAKER: (Inaudible; not speaking into the microphone.)

MELANEY SEACAT: Right. We're the experts. Good question.

MARK STRATTON: Tell that to the consultant.

CHAIRMAN JIM BARRY: Did we share the scope that was sent out on the solicitation with the Committee?

MELANEY SEACAT: Yes.

CHAIRMAN JIM BARRY: That was sent out. Did everybody get that?

(No response.)

CHAIRMAN JIM BARRY: Okay. Anybody have any thoughts on the scope?

MELANEY SEACAT: Or the ranking?

MARK STRATTON: Yeah, I - I guess I'm a little concerned about price, because I think quality is more important than - than the price. And, realistically, if price is a factor, are you diminishing the value of - of the qualification side of it, of what they're capable of doing for us? So I guess I have a little bit of a

problem doing an evaluation with price as part of the factor.

MELANEY SEACAT: Yeah, we can certainly lower that and make that a much minor - a very minor component.

MARK STRATTON: I - I think that would be - would be better. I - I would like to see a little bit more strength given on some of the other criteria that really have - I mean, especially like the experienced facilitating groups, understanding complex type technical information -

MELANEY SEACAT: Okay.

MARK STRATTON: - I think that is very important and should probably be higher than ten points when you've got the lowest price at 20.

VINCE VASQUEZ: And, yeah, water and wastewater I think it's such a - just (inaudible; not speaking into the microphone) has gone through an education process.

CHAIRMAN JIM BARRY: Bob (inaudible).

VINCE VASQUEZ: Just - just to add it to the - just the complex information - you know, complex technical information specific to water and wastewater I think is - is very important in terms of being able to - to really sort through now that we've gone through a year and a half of education, pretty in-depth, I mean, to be able to facilitate that conversation you got to, you know, be able to fly

at a pretty high level.

MELANEY SEACAT: Okay.

CHAIRMAN JIM BARRY: John?

JOHN CARLSON: Being around 50-some years in this environment and being a registered professional engineer has been a hot topic since about year number two when I was here, and Mark's hitting on it, and registered people have strived for years to not have price as a determinant; that you're looking for quality.

Now, don't ask me what the law literally says or how you apply it to this specific unusual application, but I recognize - and I'm not pushing that point - I just think we ought to make damn sure we got a legal opinion about it. And I'm all for quality versus price when it comes to an expertise and not necessary to performance that gets things done in a contracting way . . .

CHAIRMAN JIM BARRY: Suzanne, you want to say something? If you do, come up to the microphone so we catch it.

SUZANNE SHIELDS: Thank you, Jim. Suzanne Shields with Pima County. Our normal process for professional services is a two-step process. The first process is you do a selection purely based on qualifications. The next step is to have the accepted consultants provide you with costs. Normally, it takes three to six months to select under that process; that's why procurement is having you include

cost to make it faster. But, again, you can set the parameters on how much you feel like cost is a factor, including an upper limit.

MELANEY SEACAT: Thank you, that clarifies it.

VINCE VASQUEZ: Does the contract that they're bidding have a not-to-exceed? Yeah, so . . . I'm assuming we're on a pretty tight budget here and it's barely (inaudible) threshold.

CHAIRMAN JIM BARRY: We're getting some stimulus money for this. Marcelino?

MARCELINO FLORES: Mark, are you ready to suggest some numbers? I see you've got pretty good -

MARK STRATTON: You like - you like my . . .?

MARCELINO FLORES: - I - I like your math there.

MARK STRATTON: Okay. What I'd like to suggest on - on the price factor, change it from the 20, 10 and 5 to 10, 5 and 3, and then change in the first category the experience facilitating groups from 10 to 20, and then the ability to understand water and wastewater issues in the planning context up to 10.

CHAIRMAN JIM BARRY: Is that a motion?

MARK STRATTON: That is a motion.

CHAIRMAN JIM BARRY: Second.

VINCE VASQUEZ: Second.

CHAIRMAN JIM BARRY: Okay. Discussion?

MELANEY SEACAT: I just want to make sure I'm clear. I understood experience facilitating groups is 20, and understanding water and wastewater is 10, the price was low is 10, second lowest 5, and highest 3?

MARK STRATTON: Three.

MELANEY SEACAT: So for a total of 18?

MARCELINO FLORES: No, no.

MARK STRATTON: For that category, but it changes the other -

MELANEY SEACAT: Oh, no, that's right. That's right. I'm sorry. Now I understand. Yeah, a total of 10 for that category. Thank you.

MARK STRATTON: And I did that without a calculator.

MELANEY SEACAT: Yeah, gotcha. Thanks.

CHAIRMAN JIM BARRY: So tell me again what you changed.

MARK STRATTON: Okay. Experience facilitating groups is changed from 10 to 20; ability to understand water and wastewater issues from 3 to 10; and then under price, the lowest price went from 20 to 10; second lowest was 10 to 5; highest price was 5 to 3.

CHAIRMAN JIM BARRY: Okay. Let me ask a question. This is - I

hadn't thought about that. How quickly can we do this procurement process?

MELANEY SEACAT: If we select a candidate tomorrow, it goes to procurement and I'm told in an expedited process, probably by Friday we would have somebody on board, possibly earlier, but everything has to go perfectly smooth.

CHAIRMAN JIM BARRY: A week from tomorrow.

MELANEY SEACAT: A week from tomorrow, right.

MARCELINO FLORES: So they'll be present for the first meeting.

CHAIRMAN JIM BARRY: Any other discussion on Mark's motion?

(No response.)

CHAIRMAN JIM BARRY: Any objection?

MELANEY SEACAT: I'm sorry. My higher math skills are not the best, but I'm counting up the points in that first category and it's an odd number, and would you mind if I massaged the two lower categories so it comes out to an even number? In other words, we now have 57 in that category which is . . .

CHAIRMAN JIM BARRY: It comes to 100, doesn't it?

MELANEY SEACAT: I don't think so.

MARK STRATTON: But the - the total comes to 100, because the last one is 18 total.

MELANEY SEACAT: No, it's not because those are mutually exclusive; if it's the high- - pardon me?

SUZANNE SHIELDS: Price is -

MELANEY SEACAT: Because the most you can get is 10 in that bottom one; that's the most you can get. You only get ranked once. Do you see what I'm saying?

MARK STRATTON: No, I guess I'm not following what you're saying. The total points . . . oh, now I see what you're saying.

JOHN CARLSON: You have 57 -

MELANEY SEACAT: Oh, it is.

JOHN CARLSON: - on the top, 40 in the middle and -

MELANEY SEACAT: Okay. No, now I understand. Thank you. I think I understand. So it does add up to 100 still.

JOHN CARLSON: It does?

MELANEY SEACAT: Okay. We're okay. We're okay.

MARK STRATTON: That's because if it doesn't now, it didn't before either.

CHAIRMAN JIM BARRY: All right. Everybody understands Mark's motion; right? Any other discussion?

(No response.)

CHAIRMAN JIM BARRY: Okay. Somebody do the math again, confirm to the Committee that it adds up to 100. Somebody do it. Get a calculator.

JOHN CARLSON: It doesn't; it's 57, 40 and 18.

MARCELINO FLORES: No, 'cause they're mutually exclusive here. You can either give - you only give it 3 points.

CHAIRMAN JIM BARRY: Thirty, 40, 50, 60, 10, 30 -

MARCELINO FLORES: No, it's going to be 45 or 3 -

CHAIRMAN JIM BARRY: - 40, 45 -

MARCELINO FLORES: - so it's not going to add up.

CHAIRMAN JIM BARRY: - 55, 57.

MELANEY SEACAT: 107.

CHAIRMAN JIM BARRY: - and 4 is - is 97. Price can only be worth 3 points at the - at the outset.

MARCELINO FLORES: Those top two categories have to add up to 80.

VINCE VASQUEZ: Well, the problem - the problem was that you had -

MARCELINO FLORES: Ninety.

VINCE VASQUEZ: - the original lowest you had price at - you had 35

allocated, not 20 for price.

MARCELINO FLORES: Oh, no, did . . .

MARK STRATTON: No, I see - I see what you're saying.

CHAIRMAN JIM BARRY: Well, the most you could get under price
was 20.

MARCELINO FLORES: So - so the top two - the top two -

VINCE VASQUEZ: Yeah, we started out with 100 and what? 115.

MARCELINO FLORES: No, the - the bottom - the price category's
different. You only assign - the most you could assign in that category is going to be
10, so unless you're the lowest . . .

VINCE VASQUEZ: Yeah, because you only get . . .

CHAIRMAN JIM BARRY: But it's still going to come to 107 then.

TINA LEE: Exactly, right. Well, that's because when he adjusted the
bottom numbers, he was adjusting the total which -

CHAIRMAN JIM BARRY: Right.

TINA LEE: - does add up to -

MARCELINO FLORES: Yeah.

TINA LEE: - 115, so . . .

MARCELINO FLORES: No, the - the top two have to add up to 90

now; right?

MARK STRATTON: Yeah.

MARCELINO FLORES: So the top two categories have to add up to 90.

MARK STRATTON: Yeah.

CHAIRMAN JIM BARRY: Mark, let me make a suggestion. Staff understands your intent. You want to make it more important experience and facilitation, and more important on understanding water and wastewater, and less important on price.

MARK STRATTON: Yeah.

CHAIRMAN JIM BARRY: Let them come up with the rank -

MARK STRATTON: Let them - yeah. I'm good with that.

CHAIRMAN JIM BARRY: - with that. So the new motion is: This is - this is the intent to - to - to make those two things more important and make price less important -

MARK STRATTON: Correct.

CHAIRMAN JIM BARRY: - however it can be done to come up to 100.

MARK STRATTON: Yeah.

CHAIRMAN JIM BARRY: You accept that?

MARK STRATTON: Yes, I do.

CHAIRMAN JIM BARRY: And does the seconder accept that?

VINCE VASQUEZ: What you said.

CHAIRMAN JIM BARRY: We have a second. Anybody disagree?

(No response.)

CHAIRMAN JIM BARRY: Okay. That's - that's passed. You all understand that. Now -

MARK STRATTON: Yeah, just my math is just . . .

CHAIRMAN JIM BARRY: - we - we sent out the . . . the scope on this and I just want to make a point, personal point, about what I am envisioning for this facilitation process. I don't want us to go in - or the facilitator to go into this process assuming that the goal is to find unanimity or consensus. I think that that would sell us short. We have differences of opinion in this Committee. We have maybe two or three groupies and we - that's an important result and we ought to flush that out. We ought not to assume, but we need to find agreement if - if, you know, John and I want to be one camp and Vince wants to be a camp by himself, that's important information, and I think that Staff shouldn't be trying to force unanimity at the expense of - of identifying important differences.

So I hope that we go into this with the idea that - that we are not going

to be - we're not going to straightjacket ourselves into looking only for consensus; that we'll look for consensus where it exists and we will flush out our differences because that's going to be important to how the dialogue in the future goes.

ROB KULAKOFSKY: Yeah, I - I -

CHAIRMAN JIM BARRY: Rob?

ROB KULAKOFSKY: - agree. I think that what we need is help to articulate our ideas and thoughts and help us put that down on paper. I agree with you completely.

CHAIRMAN JIM BARRY: Another thought that I have and I want to share it with you. I think - and Marcelino and I talked about this last time - I think there are two things that we ought to be looking to do in our report: One is to - to look at the recommendations - there's a lot of recommendations - to look at those closely, to evaluate them, to prioritize them in our mind; and, second, to come up with kind of what our general theme of how we tie this all together.

Marcelino and I were pushing for - for the whole idea of sustainability and trying to come up with some - some real definition of what that may mean. There's probably a lot of different things. But we ought to do two things. I think we will be short-selling this whole Phase 2 process if we don't look closely at the recommendations and come up with some sort of a - I'm just calling it a "strategic

plan” - a higher level - since this is the kinds of things that we ought to be doing to pursue the goals of - of what Mayor and Council and the Board were looking for, as well as - as what our themes and concerns and hopes for the future are. Marcelino?

MARCELINO FLORES: I just - I don't know if this is among the recommendations, but I just wanted to get it out there and - and that is: Some sort of - well, I guess a strategic plan, but what - what we expect or what will we hope for on the next continuing phases and, perhaps, how that might be implemented, so if that's made - come within the theme, but I think specifically we should try and say what the other phases may - may look like.

CHAIRMAN JIM BARRY: Okay. I just - the reason I'm bringing this up is I think - and this may not be what - what Staff is thinking about - but when we get started in the first meeting I think we ought to be prepared to - to articulate to the facilitator ourselves, not through Staff, what we expect of the process. So I would hope that you - we would be thinking about that and be prepared to do that. All right.

JOHN CARLSON: Jim, can . . . ?

CHAIRMAN JIM BARRY: John?

JOHN CARLSON: I've been strong for the fact that we allow for the expression of people on this Committee that don't agree 100%, but that doesn't mean we have to express five or seven different opinions on any one subject, but I

think we have to think about how we're going to allow to what extent these - these counter-opinions or off-breed opinions or - or less-intense opinions or however and - but it's very important that we allow it to be expressed, but we can't publish 12 different opinions on one subject.

CHAIRMAN JIM BARRY: Well, let's see what it looks like.

JOHN CARLSON: Yeah.

CHAIRMAN JIM BARRY: I don't know. Maybe - maybe we'll find out we agree on everything, but I doubt it.

JOHN CARLSON: Yeah, I can guarantee you we won't.

CHAIRMAN JIM BARRY: All right. Okay.

NICOLE EWING-GAVIN: I'm handing around now the outline that -

CHAIRMAN JIM BARRY: Bob, take this over -

NICOLE EWING-GAVIN: - we're envisioning as . . .

CHAIRMAN JIM BARRY: - or, no, Chris has got to do it.

NICOLE EWING-GAVIN: - for the Staff portion of the Phase 2 final report. So this is what would be presented to you the first part of the October 1st meeting, and we'll be getting it out ahead of time for your review. This just kinda shows you how we're organizing it at this point. Introduction that will talk about the process and the - what was in the scope for Phase 2 and what kind of public

outreach efforts we've done. A section looking at overarching issues that we think have emerged from a Staff perspective; similar to what you all were just talking about, identifying areas where the City and County aren't necessarily in perfect agreement and issues that we're still working out.

And then we've - what we've done with the technical papers is group them into these four buckets: Water Supply, Demand Management, Respect for the Environment, and Comprehensive Integrated Planning. And we're looking across all the papers to find ways that we can - you know, where we're looking at similar issues across papers, and so within each of those areas we'll be summarizing some of the key points that we feel came out related to that issue. Where are shared goals among the City and County within this topic area; what are recommendations Staff has; and then the next steps that we think should take place. And then the Appendix includes the Staff technical papers, as well as all of the other papers that - and comments that were submitted by the Committee and/or public during the process. Any questions about it?

MARK STRATTON: Jim, based upon what you had just previously said about looking at the recommendations from Staff, are you looking at the recommendations from this Staff portion of the report or from the technical papers?

CHAIRMAN JIM BARRY: I think that we - it might be easier - well, I

think we have to look at what - what Staff is thinking about at the end of the process as they reflect upon it, but that doesn't mean that we can't - if they don't have a recommendation in there that we think is important, we'll go back to their recommendations.

MARK STRATTON: Yeah, I would expect our recommendations are exclusive to what we feel we want to recommend, regardless of what Staff recommends.

CHAIRMAN JIM BARRY: I think that we have to say something to Mayor and Council and the Board about how we view the Staff recommendations, and then I think we can say how we view our recommendations and then we have the policies and concerns and whatnot.

I think if you look carefully at - at the scope for Phase 2, it really was City/County agreement on things, and so we got to give City and County Staff the chance to - to come to agreement or air their differences, and then I think we can critique what they did. Bob? Give him the microphone, please.

BOB COOK: Thank you. I'm looking forward to this Staff report, actually; it looks like an interesting way of - of putting the story together, and I'm especially interested in the Comprehensive Integrated Planning.

And the only question - the only - the only comment I would make

generally is that it seemed that after every presentation or every technical paper there were comments and questions that really pointed out new areas of unknowns or uncertainties; important questions that the study or the analysis did not address that to me - and I'm making a running list of these things - need to be brought out in some sort of reporting, because I don't think the technical case for any of these issues has been really closed or completely made. So I - I would like to have a little bit of reflection on important sort of research that is yet to be done; questions that really didn't get adequately answered by the expertise that was brought to the Committee process.

CHAIRMAN JIM BARRY: Well, it seems to me that that's what our report's supposed to do, what the Committee's report's supposed to do. Staff is going to write their report. Whatever they write is what they write. We will respond to that and that sounds like a perfectly legitimate set of concerns to raise in our report. Anything else?

(No response.)

CHAIRMAN JIM BARRY: All right. Moving on to Item Number 7 - and, Rob, this is not a technical paper, this is not an expert paper. I thought before we get into the discussion of additional water, new water, whatever it is, that we ought to just remember what we said in Phase 1 about what water resources we think are

available and what kind of population carrying capacity we think they have.

And if you remember we - we had in the Executive Summary that we had CAP water; that we had three kinds of groundwater: our groundwater account, what we get from GRD, incidental recharge, we have effluent and it came to 217,441 acre-feet.

There is Tucson Water's, however, Assured Water Supply which is somewhat different and comes to 184,000 acre-feet and, without glossing over, I mean, most - a lot of that is - is how effluent was treated under the Executive Summary and how it was treated under reclaimed, and that Assured Water Supply is being reviewed and it will be amended at, what, 2015? Okay.

And then we got a report from Sharon Megdal regionally for M&I water, and she looked at CAP water and allowable groundwater and GRD, and she also looked at groundwater that's available to exempt wells and to undesignated groundwater and then effluent. She also looked at DOI's, Department of Interior, the SAWRSA groundwater, and she came up with a range - depending upon if you assume 50% of effluent is - is water used or if it's 100%, anywhere between 346,000 and 394,000 acre-feet. So that's what we saw in - in Phase 1.

Now, we talked in the Executive Summary, we talked a number of times, it's in the paper on new water, there's uncertainties associated with all of

these water supplies and we know, but these are - are reasonable numbers to think about; they're not order of magnitude different; there is some consistency and it's the best we have right now, could change in the future, but that's what - that's what we looked at in Phase 1.

Go to the next one, please. In the Executive Summary data on the - on the left, we converted acre-feet into gallons, assumed 177 gallons-per-capita-per-day and came up with a population carrying capacity of 1.9 million, which is about 363,000 more than what's being served by Tucson Water today.

If we go with the Assured Water Supply data, you get a lower population carrying capacity, 928,000, and another 194,000 that could be served with the existing water as assumed under the Assured Water Supply.

If you look at Sharon Megdal's she had two GPCD numbers, 165 and 150, and she came up with anywhere from 1.9 million to about 2.3 million, depending upon - the high estimate is on - using all of the - the effluent and the low estimate is not. If we use Sharon's data, which I did, the 177, you get a number somewhere between 1.7 and 2 million. So those are kind of carrying capacity assuming all of those water supply numbers are good; that's a big assumption, but - but that's what we looked at.

Go to the next one then. And then I just wanted to look at it from a

different perspective, which Tucson Water in their 2050 study did, they tried to take population and - and water supply and demand and figure out when they might hit the wall. They had four scenarios: low demand is - they assumed 177 and 150 I think on GPCD. They assumed that there was a 15% increase in conservation and then they looked at population. Did they serve only the Obligated Service Area or did they look at the potential Service Area, which really was the southeast and the southwest areas, primarily.

So those were the four scenarios and - and they - go to the next one - what - what you see is there's a difference. The earliest that renewable water supplies will be needed is 2017 under Scenario D, which is high demand and the potential Service Area. The latest it would be needed would be 2032, which is the low demand and the Obligated Service Area, and the other two are right in the middle. And then they also had potential end of Assured Water Supply at anywhere from 2025 to 2050. So that's another way of looking at - at water supplies and - and when we need things. Vince?

VINCE VASQUEZ: This is a question for Tucson Water. Is - is the obligated-to-serve analysis and the low demand/high demand, is it based on the - is that based on the two - the 210 or 217 acre-feet?

CHAIRMAN JIM BARRY: 177 or 150.

VINCE VASQUEZ: No, no, that's the GPCD number I understand.

CHAIRMAN JIM BARRY: Oh, okay.

VINCE VASQUEZ: But, in terms of the water portfolio that it's based on, in terms of the trigger time, is it based on the 200 number or is it based on the designation number?

RALPH MARRA: - with Tucson Water. It's not based on either of those -

VINCE VASQUEZ: Okay.

RALPH MARRA: - okay? So it's based on basically looking at what renewable supplies you have available to you - and it doesn't relate direct to the portfolios that you just discussed - it looks at basically what other renewable supplies you have available, minus effluent - it doesn't count effluent; it counts reclaimed water but not effluent - and then it looks basically at what point in time does your demand start to exceed the available renewable supplies you have available to you.

And I was watching what was up there and it's hard to decipher, you know, the table you saw up there and all these different numbers, Sharon Megdal's number and our numbers, and try to - it's very difficult to do that. If you want during the next presentation, we might be able to shed some light on that because we'll

show some graphs up there and you can see exactly what we did.

VINCE VASQUEZ: Just a real quick question while I have you up here. And so then the difference between the designation - what's on the portfolio that's on the designation and the high - the high number, what - what makes up that difference?

RALPH MARRA: What is the high number?

VINCE VASQUEZ: The high number was 217,441.

RALPH MARRA: And then there was - and then there was 300-some-thousand -

VINCE VASQUEZ: No, no -

RALPH MARRA: - that Sharon had?

VINCE VASQUEZ: - I'm not talking about Sharon's number -

CHAIRMAN JIM BARRY: Just Tucson Water.

VINCE VASQUEZ: - just, yeah, just - I'm just -

RALPH MARRA: Yeah. Right now, I don't recall how that distinction was made. I'd have to probably look at what that - what was built into that 217.

Chris, do you know that one?

VINCE VASQUEZ: Thanks, Ralph.

CHRIS AVERY: There are two primary dif- - Chris Avery with Tucson

Water - there are two primary differences between the Assured Water Supply number, the 184, and the 210 number that came out of Phase 1 of the study. The first is how it considers effluent. The 210 considers basically all the effluent that's available to the City. The Assured Water Supply number considers effluent in the context of reclaimed water deliveries. There's about a 30,000 acre-foot difference there.

VINCE VASQUEZ: So it's entitlement versus -

CHRIS AVERY: Entitlement versus use.

VINCE VASQUEZ: - proven up the capabilities to actually -

CHRIS AVERY: Yeah.

VINCE VASQUEZ: - put it to beneficial use.

CHRIS AVERY: And then the second major component is that the 185,000 Assured Water Supply application was entered before we obtained 8,800 acre-feet in CAP reallocation, as well as I think 19 acre-feet from Flowing Wells. So there - the City's CAP allocation has grown 9,000 acre-feet since that Assured Water Supply application and that's the rest.

RALPH MARRA: That's correct.

VINCE VASQUEZ: Thanks.

RALPH MARRA: One other point here to make - and I think it's - it's

really important - is that, you know, Sharon Megdal has her number that's like 300-and-some-thousand acre-feet and that's based on policy that assumes that you can pump the aquifer down 1,000 feet below land surface and then you sum up all the water that could be in there. So that's - that's different; that's a policy-related - a paper-water number -

VINCE VASQUEZ: Uh-huh.

RALPH MARRA: - that you can do based on policy, but it's not a hydrologically-based number, okay? So that's an important distinction to make.

CHAIRMAN JIM BARRY: Look, I - I didn't bring up any of these to - to criticize 'em, but just to say this is what we saw in Phase 1 and what does some of the - what does some of the things say.

And I'm glad, Vince, that you brought that up because I assumed that the - that this was based on - on the Assured Water Supply and it's not. So now there's a third number that Tucson Water's got that I don't know what it is and it reflects this and so these numbers, if you add in more, those years - those years may go out in the future.

The point is that there - there is a range that's - that's not orders of magnitude difference in - in the idea of the carrying capacity of the water that is available, assuming X, Y and Z assumptions and - and how you count it, there's

differences, but the importance is just to look at what we had talked about before because that is the background for how we talk about new water, how much new water we need and when we need it. Any other comments on this?

VINCE VASQUEZ: I just only - the one other thing I guess because I think it's relevant to the - the conversation on, quote, unquote, "new water," because that difference in terms of what's the entitlement and what it's going to take to bring that entire entitlement into the designation portfolio, there's a cost number, I'm assuming, on that if it means, you know, in terms of bringing that - making that reclaimed or making that - treating that effluent, to bringing it to customers or whatever it may be, there's some kind of cost component and, essentially, that cost component is significant because it represents the cost of that new water supply, of bringing that new water supply into the portfolios. I think if maybe we could have more brought back for us to have that discussion or there's . . .

CHAIRMAN JIM BARRY: Chris?

VINCE VASQUEZ: All right. I don't know if any of that made sense, but it sure sounded good.

CHAIRMAN JIM BARRY: Well, let me see if I understand. Are you disagreeing with - with the portfolio?

VINCE VASQUEZ: No -

CHAIRMAN JIM BARRY: No.

VINCE VASQUEZ: - no, let me just clarify. So I wanted to get to - to an understanding of what the difference was between what the entitlement portfolio is versus what they've - we've proven up to the State for our designation of Assured Water Supply, and it sounds like Staff said that we had to do - we have to do something, we have to probably make some investment or put some volume of effluent to beneficial use somehow or demonstrate that, in order to get credit for that, the difference between the 217 number and the 1- . . .

CHAIRMAN JIM BARRY: Eighty-four.

VINCE VASQUEZ: - 184 number, and so that represents a 30,000-acre-foot volume that is essentially, quote, unquote, "new water" in some - in some respect that you compare to other supplies that you might - so if it means building an effluent recharge facility so that you get 100% credit for that, there's a cost component to that versus the 50% . . .

CHRIS AVERY: Yeah, let me - let me illustrate that. One good way to illustrate that is if you look at the Assured Water Supply number in the middle, one of the reasons why we didn't obtain an Assured Water Supply application until a few years was, although we had a CAP allocation, ADWR wouldn't allow us to count that full allocation until we demonstrated that we had facilities in our five-year CIP in

order to put that allocation to use.

So, essentially, although that Assured Water Supply application was obtained a few years ago, it has SAVSARP in it and we couldn't actually get an Assured Water Supply based on our CAP allocation until we had SAVSARP, which is capable then of taking our full allocation, recharging it and putting it to use; the same issue with effluent. Until you can show that you've got either customer demand or facilities built to use that entire allocation of effluent, it's not going to really qualify for an Assured Water Supply.

JOHN CARLSON: A comment here.

CHAIRMAN JIM BARRY: Well, Bob I think had his hand up first.

BOB COOK: Yeah, I think that - that this is sort of along the same theme of, you know, if - if we're going to be counting up components of water supply, and some of 'em don't fully - can be fully defined as water supply because it needs some sort of investment, some added cost to - to actually qualify it, then we're talking about an alternative, and we need to see all of the alternatives lined up so that we can compare the alternatives, and I think that's the challenge here. We've been talking about wanting to compare apples to apples, we want to have all of the alternatives, cost benefits laid out so we can see them, and this is just an example where - where potential future water supply is sort of, you know, couched in a table

where it's really an alternative because it - because the decision to - to invest in that infrastructure to bring it up to useful water hasn't really been made; that's yet to be made, as many decisions are yet to be made and that's the whole purpose of this water study. So, thank you, Vince.

CHAIRMAN JIM BARRY: Well, for that reason, I - when we're in our group discussions - am going to recommend that we forget the Executive Summary number and just use the Assured Water Supply number for the moment and talk about the carrying capacity at 177 GPCD. John?

JOHN CARLSON: Well, like you said, for the moment, and I would say there are dramatic differences over a period of time and what period of time must we reexamine it. I'm thinking in terms of five years. But the swing in available water in the west has been dramatic lately and I just don't think we can hang our hat on every - on - on we know this right now and we can make all these decisions and proceed. We have to stop every once in a while and reexamine all those suppositions.

CHAIRMAN JIM BARRY: You're certainly not suggesting we come back together in five years for another 12-month process are you, John?

JOHN CARLSON: Well, there's a few I would accept, but I'd get rid of some of the others, yeah.

CHAIRMAN JIM BARRY: Well, thank you. I don't want to be here.

Chris?

CHRIS BROOKS: I'm a little curious looking at these numbers whether or not which, if any, of these scenarios would possibly come into constraints under the AMA management - management objective. Obviously, it looks like Professor Megdal's numbers wouldn't have a problem with that. Do Tucson Water's numbers take into account meeting the goals of the management plan?

RALPH MARRA: In order for Tucson Water to have an Assured Water Supply, it has to be consistent with the AMA Management Plan, so that's one of the criteria you have to satisfy in order to have it - to have an Assured Water Supply.

CHAIRMAN JIM BARRY: Anything else? This was a longer discussion than I thought. I just - to remind us. But it - it raises the issue that - that we can talk about these, but there's a lot of policy issues that go behind it and John is right, it's going to have to be revisited.

So let's move on. We have scheduled a five-minute break before we get into the additional water. Is that agreeable to everybody, or do you want to get started? Don't everybody answer at once. Five-minute break. I'll make a decision.

JOHN CARLSON: Three and half minutes.

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(Recess taken at this time.)

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CHAIRMAN JIM BARRY: Let's reconvene, please. All right. Item Number 8, Additional Water Resources Technical Paper.

RALPH MARRA: Are we ready to go?

CHAIRMAN JIM BARRY: Ralph, get it off.

RALPH MARRA: So my name is Ralph Marra. I'm the Chief Hydrologist with Tucson Water, and Chris Avery who you all know and he's our Chief Counsel. We're going to be talking about Additional Water Resources. You all got - all the members of the Committee got the White Paper, and so it kinda lays out everything we're going to be talking about here, but this is an opportunity to go over some of the high points and to respond to questions that you might have.

Now, I just learned that we don't have a laser pointer, so this is the pointer, and I'm going to start pointing at things up here and if there's something that you don't understand or don't know where I'm getting to, please just raise your hand and I'll make it a little bit more clear.

Okay. And this is just to do a quick little summary here. Tucson Water has put out three comprehensive water resource plans. The first one you see there on the left was brought out in 1989; the one in the middle in the green came out in 2004; and the update here, the one in the front, came out in 2008.

Now, the reason why I'm talking about this is, is that water resource planning, and water planning in general, operates within a very dynamic planning environment. Things are changing all the time. And that means that your assumptions that you use in making your projections are changing all the time; in fact, assumptions have changed since we've made our 2008 update, and shortly we'll be coming out with another update maybe in the next year or so that will take into account changes that have occurred since 2008.

So each one of these visions of the future, they're points in time looks at the future and these things are constantly changing. So I wouldn't necessarily hold to them and say this is what's going to happen; this was what our best guess or our best estimate was based on the information that was available to us at that point in time.

Now, the 2008 update - Jim made reference to that there were four scenarios, Scenarios A, B, C and D - and we looked at a number of variables and compared some things for purposes of illustration. Since this time, the City has made an interim position that we're not going to serve outside of our Obligated Area. So, at this point in time, we're going along with one of those scenarios that had that assumption; that was Scenario A that was in the 2008 update. And so this population projection you see here was that Scenario A in the 2008 update. All the

other scenarios at this point in time aren't very relevant to us.

One of the key points I want to make here was - is that in 2008, when we made this scenario, we considered this - this scenario might be a little bit optimistic and some of the other scenarios maybe they're a little bit more conservative and a little bit closer to what it might be. And so just like in a year and a half's time, you know, we've had an economic collapse, we've had all these things happen that have changed things. They change the things that we can measure in terms of how people use water.

And so what we find now is what we thought was optimistic back in early 2008 is probably pretty reasonable and maybe even a little bit conservative now. So this is the nature of the business and it's not just the nature of the business in Tucson; it's the nature of the business anywhere, okay? So, again, the things that you look at - you know, the idea here is this should give you a feel for things; it shouldn't be giving you a forecast of what's actually going to happen because no forecast is accurate; in fact, every forecast is inaccurate.

So here we have the population projection and you can that in 2000 we had about 625,000 people in the Tucson Water's Service Area. Looking up into the year 2030, we see about a million people. And then looking off again to 2050 - and notice it's a dashed line - that's telling you these numbers become increasingly

fanciful the further out in time you go, but you see a number that approaches 1.2 million. I would think about these numbers as being more ballparkish the further out in time you go.

Now, here's a projection of total water demand based on that population number that you saw. Again, this is that Scenario A projection that was in the 2008 update. This is the demand graph that should be in your document that you have in front of you. What you see there early in time, you see those - those red squares, that's the actual water demand - those aren't projected numbers - that we saw from 2000 to about - it looks like about 2007, 2008.

Now, something there should tell you that something is wrong or something very unusual is happening. Notice how they're kinda flat, the square boxes there, they're all showing kinda water demand has been flat for like the last four or five years. Our projections tell us it should be increasing about 2% a year. We're seeing something; it's something that was occurring - it started occurring during the boom years; it's continuing after the economic collapse has occurred. We're seeing something that goes back in time. What we're seeing is lower use, lower use for water on a total scale. And if we look at our GPCD numbers, or our gallons-per-capita-per-day numbers of what people are doing, those numbers are much lower than what we ever anticipated, so something's happening in our

planning environment.

If you talk to people in the power industry, they're seeing the same thing. If you talk to water providers like in the City of Phoenix or in Scottsdale or Denver, they're all seeing the same thing, and they're all being caught by a little bit of surprise.

So what does that mean in terms of what's the value of your projections? What that means then is your projections are giving you your best estimates and glimpse into the future based on the assumptions that you have. But you have to keep an eye on this all the time. So when we come out with our next update we're going to have different assumptions that will take into account some of the things that we're seeing now.

So, in our water demand number back in the year 2000, we had about 125,000 acre-feet of supply being delivered and, if you look at 2030, you're seeing a number that's closer to 180,000 acre-feet of total supply; this is both potable and non-potable supply combined. And then looking off again further out in time, notice how just in the few - first few years, the first five years, things have not operated according to projections, so you can imagine, well, what does 2050 mean? There's a lot of uncertainty when we talk about numbers in the 2050 range or the 2030, 2040 range. Nobody has a crystal ball to tell you what's going to happen there, but it

gives us a sense of things. And we're always having to revise what our sense of things is, and that's just the nature of the business, there's no getting away from it.

So now here's our water utilization plan, and you saw what our total demand was in the previous graph, well, that's the top line that you see here up on the screen; that's our total demand line and we're going to show this to you over periods of time as to what it is that we're looking at because we think it might be - may be a little bit more understandable that way.

So what you see here from 2000 to about 2015 - can you see that very clearly by the way? My angle on here seems very odd, everything looks muted to me. It looks good? Okay. What you see here is the blue that you see beginning in 2000 we were a total groundwater system. Once you get past - when we're not counting the reclaim system - everything was groundwater that we were using. And then you saw in 2001 there in the green, what you're seeing there is we're ramping in our use of CAP water, and you're seeing like from - from 2001 to about 2008, 2009, how we're really ramping that up pretty quickly.

And then you see another source of supply there and it's called "Incidental Recharge." Now, this is the water business, what it means is that we get credit for about 4% of the water we deliver every year, and that's considered that that water has recharged the aquifer and the regulators give us credit for us. So in a

way you can kind of think about that as renewable groundwater. So this is the glimpse here up to 2015.

Okay. Now, let's push it out here a little bit further and we're going out to 2030, okay? And so we're seeing a continued ramp-up here of our CAP water, and it looks like around 2017 or 2020, something like that, we'll be fully utilizing our CAP allocation at that point in time and it starts to flatten out.

And then what you also see up there in the little orange stippling there - what you're seeing there is that it's the beginning of our use of CAGR D water. And what our plan is, is that after we fully utilize that CAP allocation is to utilize our CAGR D allocation if you want to call it that; it's 12,500 acre-feet. And what we're planning to do with our CAGR D allocation is we're going to take that water that comes off the canal and we're going to recharge it just as we do our CAP allocation, and then we're going to pump it from our well fields that we've built on top of our recharge facilities so that's renewable groundwater; it's dependable, renewable groundwater.

And then you see that question mark there and I'm going to talk about that question mark because it's really important in the next phase. So here we are we're looking out further in time and you see that green area there with question marks and it's stippled. Okay. What I'm talking about there - what this slide really is

showing you is there's going to be a shortage to our CAP allocation at some point in time in the future. CAP tells us it's probably going to be after 2025. We might begin as a - as a municipal industrial CAP contract holder that we might experience that, or it might be later, some time later. We don't know what the magnitude of that shortage would be. We don't know its duration. Nobody has the answer for these things. So this a critical uncertainty in our water planning process; that we look ahead.

What you also see here is you have . . . here, now we can use the pointer. So what you have here then also you're seeing all of our renewable supplies stacked up. You're seeing our CAP allocation. You're seeing this 4% groundwater credit we get every year. You're seeing our full CAGD - CAG- - CAGR allocation, which is 12,500 acre-feet a year. You stack all these up and we come to a point right here where we're saying beyond this point in time, we exceed - our demand exceeds the water resources that we have listed here, but these are not all of our water resources that we have available to us. These are just the renewable supplies that we have available to us at this point in time.

And what you see there then in the year 2032, based on this projection, we begin to have a gap, okay? And that's that blue stippled area up here. And the gap is really an illusion of a gap; it's not a true gap; it doesn't mean that we don't have any water; that's not what that means. What that means is that

we've ex- - at that point in time we exceed the renewable supplies that we have available to us, but we have other water resources in our portfolio that we can use to fill in that gap, and I'm going to talk about that a little bit more shortly.

Now, on the earlier slides I mentioned to you - I said look over here, look at the demand curve, look at how flat it is over here. So what that means then is that - and we're also seeing greater conservation, we're seeing more efficient water use than we've seen in the past - what that means then is these demand curves are starting to flatten down, and in our next update that we're going to have we're going to be showing this flattening effect. What that means then is if your demand curves start flattening, then this point starts moving out further in time. And what we strongly suspect at this point in time is that point would probably move out beyond 2040, or maybe even beyond 2050 based on what we're seeing now. And that is still using conservative assumptions, okay? So does that make sense?

So what are we going to do then about what we call the "gap?" Well, we can look to add additional conservation. What that does then is it starts flattening your demand curve is what that does. When it flattens your demand curve, where it intersects this line starts pushing out further in time; that's a good thing.

But there's other things that we can do. We can fully utilize our effluent, our - our existing supplies. So here's the City's effluent entitlement; this is

the part of the City's effluent that's not included in our reclaim system; that's a renewable supply that we don't have shown here, but that's something we can develop and bring into play into the future. And the City has millions of acre-feet of groundwater credits to use in this, and so that's an important aspect also because that gives the City a bridge supply as we look to get the initial supply and apply increasing conservation measures.

And here we are now talking about acquire - acquire additional supplies and it's really the subject of our paper that - that you have here most recently. And if you notice there, there's four there that are being talked about, but two of 'em are in red. One of them is main-stem Colorado River water. So a possible source of supply to acquire is main-stem Colorado River water. Now you might want to ask, well, what's that? Is that CAP water by another name? No, it's not.

Going back in time, thinking back in Phase 1 - and nobody's going to remember this unless you're a water guy - is that the City of Tucson's - or, I'm sorry - the State of Arizona's - Arizona water right entitlement to the Colorado River is 2.8 million acre-feet, okay? The CAP, the project, has access to 1.5 million acre-feet, so the difference between those two is 1.3, and that's the water that's on the river, that's still on the river that's not diverted by the CAP canal. So that's going to be one

of the sources of supply that many water providers and water users are going to be looking to acquire in the future.

The other supply here we're talking about is imported groundwater, groundwater that occurs in other basins in the western part of the state; this, again, is another supply. Notice that the arrow here from the - from the square you see not only points to that area of the gap where we exceed our demand, but it also points to the shortage area where we talk about CAP shortages. So, as we look into the future, being about to buttress or reinforce our CAP allocation is going to be a very big critical concern to us. And, in fact, what you see here is that the onset of a possible shortage could be 2025, 2030, in this area.

This issue of what about meeting the needs for growth in the future? That's an issue that occurs later in time. So, as a water resource manager, what I'm looking to do, my critical concern, my highest priority is let's look for ways to reinforce and buttress our existing CAP allocation, and that's a big driver. A second thing I'm thinking about is looking into the future, what kind of future demand scenarios do we have that we have to have additional supply to meet the needs of growth? And so with that, I'm going to pass it over to Chris.

CHAIRMAN JIM BARRY: Chris, one second, please.

VINCE VASQUEZ: I just wanted to ask Ralph just to make sure

because I think sometimes people can - when - when you say “on river” sometimes people say that’s actually water that’s - that’s committed in the river, but actually the 1.3 is diverted annually for agricultural uses and so it’s not as though we’re taking more water out of the river; it just - we’re diverting it for different uses in that scenario.

RALPH MARRA: Yes, that’s correct. When we’re talking about accessing that on-river water supply, you know, part of Arizona’s water entitlement, that’s water that’s currently going to agriculture along the whole river there, so all that intensive agriculture you see is water that, in the future - and this is going to happen, it’s already happened in California, it will happen in Arizona as well, it’s just a question of when - and that is that there’s going to be some process of following of ag land along some of those areas, and that water’s going to be diverted to the municipal uses in the three-county area, which is the CAP service area showing up here right now, so that’s what that means. So it’s water that’s already being used, already being diverted, but it’s going to be diverted for a different use.

CHAIRMAN JIM BARRY: Clarification. The main-stem water goes to the Indian tribes and to agriculture, isn’t that correct?

RALPH MARRA: That’s correct. So a portion of that main-stem Colorado River water is going to some of the Indian tribes along the river, and some

of that water will not be accessible, but some of it will be. Now the question is: How much and at what cost? These are some of the critical uncertainties that lie ahead.

CHAIRMAN JIM BARRY: Okay. Chris?

CHRIS BROOKS: When you - when you're talking about recovering groundwater credits that the City has, obviously, there's going to be limits on - on what can be recovered in a year, physical limits - and I'm assuming that there are some legal limits?

RALPH MARRA: In terms of legal limits, we have access to well over a million acre-feet of groundwater credits right now, and probably by the year 2023 we're going to have an additional 2 million acre-feet at that point in time, in addition to what we have.

And the limitation then will be our physical ability to extract it, you know, what are your well field capacities? How much can you pump? But the big key for all this is, is that we want to reserve our groundwater credits for a time out in the future where you're going to need them as a bridge. As you set up for your next bucket of water, this is something that can tide you over a little bit while you work some of those details out. And actually Chris, in the ADD Water process, he's going to be talking about what that next bucket is and what that process is.

So groundwater is not something that we want to rely on, on a year-by-

year basis; in fact, we want to conserve those credits; they're very valuable to us; those are credits that are always going to be here. Well, the groundwater's going to be here, but some of your renewable supplies like your CAP allocation is vulnerable to shortage, so you want to reserve those groundwater credits for times when there's a shortage situation and you can use that supply to help offset the difference. Does that make sense?

CHRIS BROOKS: Uh-huh.

RALPH MARRA: But it's something we want to conserve; it's not something we want to burn up and just - you know, burn up your groundwater credits; these are something that are very valuable to us.

BOB COOK: Yeah, I had a question about the - the - when the question mark part of the graph appears, it looks like it's a large step. Isn't it actually in reality a gradual process? How - how do you explain that?

RALPH MARRA: Well, this - this is being done just for purposes of discussion; this is not meant to be an actual quantified shortage and this is what it will look like.

BOB COOK: But it's initiated in a specific year, what's the . . . ?

RALPH MARRA: Well, let's talk about that very briefly, okay? And it's a very good question. And that is that when a shortage is declared on the Colorado

River - and right now based on what CAP tells us, they're saying, well, it could be maybe around 2015. There could be a declaration of shortage on the river, okay? But you don't see that up here, do you? You don't see it in 2015. You see it later in time, 2025, maybe 2030, something like that. The reason why it's that way is that when there's a shortage declared on the river, that the lower-priority CAP water users are the ones that get shorted first, okay?

So I think Chris in an earlier discussion talked about the priorities and what they are and what - what gets cut first. Well, the municipal industrial subcontracts that we have and the City of Phoenix has and Scottsdale and Mesa and Tempe and all these communities have, these have a very high priority. What it means is, is that for - for us to have a shortage, it has to be a very severe shortage on the river. If it only - if the shortage is only kind of a moderate one, it may never touch us.

But, what I'm going to tell you is, is that in time we will have a shortage that will touch us; it's a matter of time before that matters; it's decades out, but it will happen. And so what we're doing now as water resource managers is, is that we're looking ahead and we're saying, "What could we do now to increase our flexibility to provide supply to our residents?" And so a glimpse of 20 years in the future is not too far and so we're making our plans now.

CHAIRMAN JIM BARRY: Mark?

MARK STRATTON: Yeah. Ralph, one of the things that I - I think that needs to be emphasized that in going to the GRD, and for the additional supplies, the much higher costs that we're probably going to be seeing for these additional supplies -

RALPH MARRA: Right.

MARK STRATTON: - forecasts for the GRD water is going to be quite a shock for a lot of people when they start seeing what the real numbers on acquisition's going to be -

RALPH MARRA: Right.

MARK STRATTON: - and so would you look at potentially postponing the GRD as opposed to using your groundwater credits and - and pumping groundwater to lessen a financial impact along that way?

RALPH MARRA: Well, what you would probably do - and I can't tell you for sure what we're going to do - but what I would be thinking about doing is - is that you probably do a balance of things because there's so many considerations when it comes to - with the charge or the rates that people pay for water, but here's the other side of it: When you look into the future and you look at the additional water supplies that are available to us, they will be much more expensive than they

are now. CAP is much more expensive than groundwater - I'm sorry - yeah, that's much - it's much more expensive groundwater. As we look ahead into the future, the future buckets of supply - and Chris is going to talk about some of them shortly - these will be more expensive than the ones that we have here now.

And so then the big question is, "Well, what is the willingness for people to pay for these supplies of water?" Well, what I suspect we're going to find is that people are willing - are going to be willing to pay for it because we're talking about Tucson Water Service Area and the year 2030 maybe having a million people, and you're going to be distributing that cost according to a very large customer base, and so people are not going to be just knocked down flat over a huge increase in their water rates; it actually will be gradual because those costs are distributed amongst so many people.

And that's why when people look at future water supplies, the ones that are way out there in time, the ones that seem like technically inconceivable, that nobody would ever want to pay that, well, it might be people will - might be willing to pay it at that point in time when there's more people here to distribute that cost, and then that cost of bringing that water in becomes less and less critical on a per-person basis.

Now, if you're a small water provider and you don't have a large

customer base to draw on, then the small water providers will suffer because the costs to their customers are going to be huge. But the larger ones probably would be able to absorb it.

BOB COOK: And I think the - the issue of cost per volume is an important one and I think when we look at a graph like this, you know, that's hidden under the data. If you just take the green area up to 2010, the current period, it appears as if that supply is constant going out into the future. But, in fact, that - that supply is subject to energy costs and other costs as - as additional supplies beyond that, that we're talking about way in the future.

And - and, because - because what we're ultimately going to be deciding on is what we spend our money on, it seems that we ought to be, you know, really tracking the - the - the cost per volume for all - all - all supply components over time, because we may not be able to - to actually afford that volume of CAP in the future if there are cheaper alternatives.

RALPH MARRA: Well, I suspect that the cheaper alternatives would be very short-term cheaper alternatives and using the easy water - see, that's why we have a groundwater deficit now is because this huge - this whole area developed on cheap groundwater, and so the consequence for that, you know, 50, 60, 70 years later as you have huge water level declines and we have a huge deficit in the water

budget and then it became imperative for us to shift to renewable supplies so we don't continue mining groundwater. Groundwater is still the cheapest source of supply but we, as a community - and communities like us in the Phoenix area and other areas in the arid west - have made a decision that we have to shift to renewable supplies because those are more sustainable than continuing to pump groundwater and suffering the consequences of doing that in the - in the future. So what I'm saying is: With regards to CAP, we already arrived, we already made that decision decades ago; that we needed to make that shift.

Now one thing, Bob, that you said that was really important to me was that you said, well, you know, power is going to become more expensive, and then even the CAP supplies that we already have entitlement to will become more expensive; that's true. The thought that we're not going to use that water because it's going to become expensive, I don't think that's true.

BOB COOK: What -

RALPH MARRA: I think -

BOB COOK: - what I'm - I'm really curious about - and I understand the groundwater versus CAP - what I'm really interested in is at - at what price per acre-foot does rainwater harvesting become very, very competitive? And we have not had that answer.

RALPH MARRA: And rainwater harvesting was part of the White Paper and there was some of that discussion there, and I think it's relevant, and take a - you know, if you haven't seen it, take a look at it and you're seeing how much you think you can gain with that; what that really means. And, as a water resource planner, I wouldn't want to basically plan on rainfall as being my ultimate source of supply, especially with climate change and all these other prognostications that people are making about reduced rainfall in the future. So it's part of the challenge that we have.

CHAIRMAN JIM BARRY: Let's - let's move on to Chris. We're running out of time and we don't want to shortchange a lawyer.

CHRIS AVERY: I think you do.

CHAIRMAN JIM BARRY: All right, I lied.

UNIDENTIFIED MALE SPEAKER: At those rates.

CHRIS AVERY: What we - what we've got here is just a quick diagram of the Central Arizona Project Service Area, and this is a way to introduce the ADD Water process.

When we talk about trying to find additional water supplies for Tucson, this is not an abstract process that we're talking about; this is a process that's been going on for the last year; it's a process that we talked about briefly last fall with Ken

Seasholes and myself talked about ADD Water, too, on a preliminary basis and we're back here today to give you a more recent update about what's going on.

This three-county service area for CAP is important because it's the area that paid for the canal in the first place or, and more accurately, continues to pay for the canal today, and it's the area where CAP is currently authorized to provide service.

As you can see, the - the canal begins up at Lake Havasu, comes through central Arizona, across Phoenix and down to Tucson. Along the way, the canal traverses three groundwater basins that are important potential sources of supply for the ADD Water process, or for the next bucket of water: Butler Valley, McMullen Valley and the Harquahala Basin. That imported groundwater, in addition to main-stem Colorado River water, are the first two components that Central Arizona Project Staff, as well as ADD Water participants, are looking at to supply the ADD Water process.

The other component that the ADD Water process participants are looking at is canal capacity, and the - the most relevant estimate at this point is that the existing canal can serve about 300,000 acre-feet of additional supply with some moderate tweaks to operational protocols, and it's capable of serving another 400,000 acre-feet of water with some fairly expensive infrastructure, with what are

commonly called "side boards," but I think they're a lot more complicated than just nailing a couple two-by-fours and some four-by-eight plywood to the side of the canal, but that's nevertheless a lot less expensive than reconstructing the entire canal or pump stations or pumping plants.

So, according to CAP Staff and according to the ADD Water process, this is a reasonable estimate of water supplies that might be available in the ADD Water process. Again, Bob, I think you've got a point: There's not a cost component here and - and I think that as we go out and try to acquire rights to main-stem Colorado River water and develop the infrastructure necessary to import groundwater we'll find that those costs are going to be expensive. In the Phase 1 report, we estimate those costs at - conservatively at an order of magnitude higher than existing costs, and I'll stick with that for now.

There's two other components here that are important, though. One is that you can see that the total amount of what - what these planners think are the readily available sources of supply is about 200,000 acre-feet in the canal capacity plus side boards, so there may be some potential to find additional sources of water supply.

You can see that one of the - one of the real values of this water is that it - it - it will be higher-priority water than Central Arizona Project water; either you'll

be able to pump groundwater during a time of shortage on the Colorado River or obtain water from the Colorado River that's equal priority with California instead of secondary priority. So ADD Water can be really important during a time of shortage again. During - during Ralph's presentation he showed that green area with the questions marks. ADD water may become very important to us during shortages on the river or during potentially disruptive infrastructure failures on the CAP canal, especially down at the Lake Havasu area. You can perhaps still get water into the CAP canal at - in the Butler Basin or Harquahala Valley and still deliver water into the Phoenix area.

Finally, we're going need to do some improvements to the CAP canal and then the priority of these water rights, once acquired, and the expectation of those of us who are ADD Water participants, as well as CAP Staff, is that they have the ability to supply the needs of the three-county area for a long time.

ROB KULAKOFSKY: Chris?

CHRIS AVERY: Yeah.

ROB KULAKOFSKY: On the groundwater from three western basins, are - are you - are you figuring on, quote, "Safe Yield" off of those or is that just sucking those things dry? And if - and - and, if so, if you're just going to suck 'em dry, how long are you going to be doing that and how - how long are they good for

and what are the environmental repercussions then?

CHRIS AVERY: What you are talking about is using those groundwater basins as essentially a mining - groundwater mining operations in order to supply water. The - the duration of that groundwater pumping, the modeling that's necessary to support that, and the environmental consequences are still largely unknowns in the ADD Water process. But I don't think it's - it's - I think that those consequences are going to be severe. I think that the cost of mitigating those consequences and dealing with those issues is going to be costly and, therefore, I don't think that - when you talk about importable groundwater as an ADD Water supply, you're not talking about importable water at \$70 an acre-foot. You're talking about importable water at an order of magnitude higher than that, even for groundwater in order to attenuate some of those issues.

So what you've got in - in ADD Water is a process that's gone on for a year now and we've got a whole host of issues. I've given you basically a written explanation of those issues. What I'd like to do - you can see that there's a wide variety of issues, everything from who's eligible to ADD Water process, how it's governed, how the structure will work, how costs are going to be repaid, and what the water supplies are, virtually, all the issues that you would consider in starting a water supply program from scratch.

At this point, I'd like to really talk about two of those particular issues to use them as illustrations for where the process is. And the first of those is the question of who owns the infrastructure. So what's we've done - gone - gone through as a stakeholder process is identify the issues and propose potential resolutions of the issues that have been identified.

In the case of ownership interest, both the small group who worked on this issue, as well as the larger group that considered this issue were able to reach consensus. So as far as you can consider an ADD Water issue resolved, this is the - a pretty good example. Basically, the group agrees that title to main CAP facilities remains with the United States; that any auxiliary facilities to develop ADD Water supplies would be owned by the Central Arizona Water Conservation District, not the United States; that ancillary facilities for the delivery of ADD Water from the CAP canal to some point of use would be the responsibility of the end users. So the ADD Water process is not going to be in the business of extending the CAP canal or extending CAP infrastructure beyond where it currently exists. And that there's a realization that it'll probably be necessary to negotiate with the United States for how to use that excess canal capacity.

One of the other issues that I thought would be interesting to show you is this question of how need plays a role in sharing supply. And one of the reasons I

thought this was interesting because at the beginning of the process I think there were maybe a slight majority of folks who thought that the outcome would be this way, but I certainly don't think that the outcome of this question was unanimous at the beginning. But, in going through the process over a year, all of the participants have agreed that this is not going to be a need-based process, like the original CAP allocation was. So the participants agreed that everyone who wants to participate in the ADD Water process has the ability to determine what they need; what they want out of the process. The connection is, as you go through some of the cost-sharing proposals is that those supplies are going to be expensive. So you can determine what you want, the break point or the determinative factor is going to be what you're willing to pay for 'em rather than how badly you need them. And so you're talking about then ADD Water moving into sort of a market-based-willingness-to-pay-distribution model rather than an I-have-needs-that-are-greater-than-my-neighbor-so-I-should-get-the-water.

There's also a consensus on the part of the participants that, as long as the available supplies for ADD Water exceed those needs, that need doesn't play a determination; however, what you see for further discussion - what's called the "Hammer it Out Group," or "HIO" - and in the Hammer it Out Group then there will be a series of discussions over the next few months to see if we can

resolve the issue of how to deal with the situation where the collective needs of the participants exceed the available supplies.

And what you're seeing here - both in the earlier example, as well as this one - is actual documents from the CAWCD website. So you can go online, you can see - when you - when you read through the categories of issues and you look at the way those issues are resolved, I'm trying to give you some guidance to be able to look at that website, poll through the issues. When you see agreements, what that means is the groups reached consensus on this particular issue or, in this case, the particular portion of the issue and agree that there needs to be additional discussion on - on the - on a particular subset of issues.

One of the issues that you don't see on the website is how the whole thing will be governed and that's because we realized there was no way to reach agreement on any part of that at the very beginning. So that's sort of - questions 1 and 2 are kind of missing entirely.

But this is what - this is what the CAP website looks like. So if you look through this website you can see there's no question 1, there's no question 2, the need determination is question 10, and the ownership interest is down here at question 15. So, again, I invite you if you're interested in the ADD Water process, this is ongoing information. This is a meeting that we had last weekend in order to

try to see where consensus could be reached on these issues. There will be a series of meeting coming up on October 2nd and starting every Friday where the Hammer it Out Group - Mark's got some representation on the Hammer it Out Group through Metro, Dorothy O'Brien from Marana has representation on the Hammer it Out Group, Tucson Water has representation on the Hammer it Out Group. So we'll be driving a lot to Phoenix over the next few weeks trying to get some resolution to these issues, and I urge you to look at the website and I hope that we've given you some guidance for how to navigate these questions and see where the - the answers are coming. And, with that, we'll take any questions you might have.

JOHN CARLSON: Yeah. Chris, this is crazy. I almost don't believe - I remember it this way, but 17 or 25 years ago, there was an article in the Tucson paper about desalinization of seawater, and at one point it really struck me and they said, hell, it would cost so much to haul the salt from Tucson back - back. And, of course, now we have atomic energy and it could be located there and the salt left there, but have you people even thought or projected or even discussed desalinization of seawater?

CHRIS AVERY: If you look at those estimates of ADD Water, the current, you know, best - it may not be the best thinking, it's the most widely - widespread thinking at least, is that until you - until you get to the later stages of

ADD Water, maybe that area between 500,000 and 700,000 acre-feet, you don't need desal. You - you -

JOHN CARLSON: I don't doubt that. But -

CHRIS AVERY: Yeah.

JOHN CARLSON: - I mean, you people have thought about it?

CHRIS AVERY: CAP has presented some desalinization options. I think any major water provider or wholesale water provider in the western United States is thinking about desalinization options. There's a realization that it's prohibitively expensive.

JOHN CARLSON: Yeah.

CHRIS AVERY: There's a realization that the technology's not quite there, but there's also some attractive components of, you know - I'm quite certain that Las Vegas is even today thinking about how they can build desalinization plants somewhere along the ocean somewhere in the western United States in order to increase the amount of their CAP allocation.

JOHN CARLSON: Meanwhile, they're trying to steal water from where I was born, 240 miles north of there.

CHRIS AVERY: Well, that too.

RALPH MARRA: The desal question - and when you say "desal"

you're saying "ocean desal" -

JOHN CARLSON: Yeah.

RALPH MARRA: - I think You know, ocean desal is not in the next bucket. What we're talking about here in the ADD Water process, that's the next bucket, but maybe it's in the bucket after the next bucket after the next bucket; it might be out there in time -

JOHN CARLSON: I agree. I just wondered whether you all had talked about it.

RALPH MARRA: People talk about it. People talk about everything and they talk about fanciful things. They talk about things that seem fanciful now, but maybe 50 years from now it won't be -

JOHN CARLSON: Yeah.

RALPH MARRA: - okay? And so there's a lot of thinking going on. There's a lot of technical issues. There's a lot of environmental issues. There's economic issues. In fact, those issues when you talk about ocean desal are daunting and so that's another day.

JOHN CARLSON: Yeah.

RALPH MARRA: So we're looking at water supplies that the issues will likely not be so great -

JOHN CARLSON: Well, I agree. We shouldn't -

RALPH MARRA: - and economics won't be so -

JOHN CARLSON: - waste too much time -

RALPH MARRA: - challenging.

JOHN CARLSON: - talking about it now, but I just wondered out of
curiosity if you people -

MARK STRATTON: Well -

JOHN CARLSON: - had talked about it.

CHAIRMAN JIM BARRY: Mark?

MARK STRATTON: - John, one thing, the Carlsbad desal facility that
Poseidon is doing, I heard a presentation that it was 97 permits that they had to get
from various agencies to get that approved, and that they have to get an extension
on some of them so that they don't have to start the process over again, but it took
them a number of years.

But along with the desal, there's also brackish water issues, too, that
are probably more direct with respect to the ADD Water process in the Buckeye
area, maybe you can address that as well -

RALPH MARRA: Right.

MARK STRATTON: - Ralph.

RALPH MARRA: In the paper that was given to you we talked about brackish groundwater, so that's why I made that clarification with you. When you're saying "desal," are you talking about seawater, ocean desal? But there's a lot of brackish groundwater in the Phoenix area and a lot of people have already targeted this water because it's not good for anything else. And so the thought is this water could potentially be pumped, desalinated, okay? You know, the salt's removed and that water could be a potential source in the ADD Water process, but that's basically - people are just kinda talking about it. There's no idea of a quantification of how much water that is. In fact, that's why you didn't see it on the graph or the table that you saw here and there was a footnote beneath it saying we're not talking about brackish groundwater right now. We're not talking about ocean desal because we don't know anything more than what we just said. But it is a potential source of supply and people in the Phoenix area are looking at it. And if that becomes an ADD Water supply, that would be a supply that could potentially be available for the whole three-county area, and that could be something that might be worthwhile to investigate in the future.

JOHN CARLSON: Thank you.

CHAIRMAN JIM BARRY: Marcelino?

MARCELINO FLORES: I had a couple of questions. Throughout the

paper I heard the word “buttress” the water supply several times. What is the role of the Water Banking Authority, and aren’t they supposed to firm our water or they just don’t like you guys or . . . ?

RALPH MARRA: Yes, they are firming the water; in fact, they’re firming the water for the cities, those cities like us who have these high-priority contracts, they’re firming that for us, okay? And they’re firming it for Metro and they’re firming it for Tucson Water and they’re firming it for Oro Valley and the City of Phoenix and Tempe.

Now, the word - when you’re talking about firming, the Water Bank is firming. There is water being banked in our AMA as we speak. Some of that water, in fact, is being banked at our CAVSARP and SAVSARP facilities; that’s where we like it to be so we can recover it in times of need. So that’s happening.

But the firming process was envisioned at a time - when it was created, the program was created, it was created at a time where you’re only firming for drought. And so after the drought is over, everything goes back to normal again, and so that was that temporary period of time where you needed this, you know, you know, stored Colorado River water in the aquifers that you could bring up.

But what’s going to be the challenge that lies ahead? - and you’re going to hear more and more about this in the future - is that the firming process did

not contemplate climate change, and climate change is not a temporary phenomenon; that could be a open-ended, long-term kind of a thing. And so when we talk about getting ADD Water to buttress or reinforce our existing allocation, what we're basically saying is, you know, firming is only going to take you so far, but as - as a dutiful conscientious water resource manager, I want to minimize the risk to the greatest extent possible, and so I would look to get some of these ADD Water supplies and make them available to us because they are more reliable than the CAP allocation. There's less chance that they're going to be shorted. And so that's a good thing to have in your pocket; that's - that's the real firming for the indefinite long-term.

MARCELINO FLORES: And another question if I may - and this was just as the ADD Water process was described - it seems as though if you're able to afford or pay for the water that you can say exactly how much you need or take all the need. Is there like a monopoly kind of potential out there or are there some criteria for, again, being part of the ADD Water process that would prohibit that?

CHRIS AVERY: I - I think there are some criteria for being eligible to participate in the ADD Water process that need to be resolved. One of the questions is: Will ADD Water be capable of being served or delivered outside the three-county area - Prescott and Flagstaff have shown up recently, for example -

that's an eligibility question.

But, in terms of need, the assumption on the part of the participants thus far is that the cost is going to act as - as that deterrent; that there's - if - if you - if you can accurately represent the cost of ADD Water and forecast it and require folks who want water to pay for it up front, or at least some substantial portion of those costs up front, you eliminate this ability to game the system and you might be able to deal with one of the issues that plagued CAP early on, which was that there was a lot of allocations out there but some of the users weren't paying for their allocations up front and that caused some real difficulties for CAP during the early stages.

So, again, right now it's kind of surprising, but it is a consensus result of the committee process, this stakeholder process that's been going on since last spring, that participants determine their needs and we'll see where that gets us in the future.

MARCELINO FLORES: Okay. Well, the eligibility then - again I'm not saying that somewhere within Arizona, you know, someone's going to buy up all the water, but I'm talking more internationally - if there's some potential for that or how is that going to be . . .?

CHRIS AVERY: At this point, we're just talking about Arizona and the

three-county area.

RALPH MARRA: The one point here that's - maybe this kind of gives you an illustration as to what's going on right now - is basically there's two basic questions that the ADD Water process is looking to address, and that is: How do you share it amongst the people who want it and how do you pay for it?

And so out of those two basic questions, 24 issues, all these questions that Chris showed you there on those two slides. And there's more issues than that that are coming, okay? So this gives you an idea that when you're talking about additional supply and additional water where we live, it's a very complicated thing and it's going to take a while to hash some of this out, but there is a desire on the part of the participants to do this, so it's going to be - it going to be a little bit of a messy process; part of it's going to be a lot of agreement and consensus on some things; some things there's not and that's when it's going to be really kind of interesting; that's when the (inaudible) will occur.

CHAIRMAN JIM BARRY: Vince?

VINCE VASQUEZ: Is it possible to go back to the graph with the water portfolio? Just kind of a food-for-thought statement and I think . . .

RALPH MARRA: Is it that one or -

VINCE VASQUEZ: No, the port- -

RALPH MARRA: That one?

VINCE VASQUEZ: - there we go.

RALPH MARRA: Okay.

VINCE VASQUEZ: Is that, you know, as we - I think this is piggy-backing on what Mark said - is that as we go out into the future with GRD and the reliance on that as a - as a supply, the fact is that the GRD is going to be buying the same ADD Water supplies that - that all the municipal providers are going to be providing, so rather than having your additional water supply wedge up there, it might almost be more cost-effective or actually more secure a strategy to - to use your additional water supply where your CAGR, you know, volume is and - and then forego your CAGR allotment till you really, really need it kind of a thing.

RALPH MARRA: It may be that ADD Water is much more expensive than the CAGR.

VINCE VASQUEZ: Right. Well . . .

RALPH MARRA: Okay. That's - a real good chance of that. And on the other part of it is - what is the other part? I forgot what it was, but it was very important.

BOB COOK: Yeah, I wanted to go back to the rainwater harvesting questions. You know, say that the - you know, the . . . you know, that we - that we're

considering an upper bound of supplying or, say, additional demand and a lower bound of loss of existing supply, so maybe there's a 30% growth in demand or, on the other extreme, there's a 30% loss in - in the renewable supply, and that's sort of the - the planning area that we're dealing with here, and when you make statements in here such as "rainwater's highly variable from - from year to year." Well, it used to be about 12 inches a year, now it's about - down to about ten inches a year . . .

RALPH MARRA: (Inaudible; not speaking into the microphone) in any one year, any 12 months is variable. So the whole point of that are a lot of numbers that you get about 12 inches a year, that's an average number, and in some years you can get half that and some years you can get a little bit more than that -

BOB COOK: Yeah, and -

RALPH MARRA: - and that's the - that's the variable nature of it. But what you see is 12 inches of an average, that's a statistical average -

BOB COOK: Yeah, yeah.

RALPH MARRA: - it's not an amount you can depend on -

BOB COOK: Yeah.

RALPH MARRA: - from one year to the next.

BOB COOK: Yeah, but that same variability exists in the whole Colorado watershed, and when we have a drought year here, we could also a

systems drought.

RALPH MARRA: Well, the whole point here is, is that on the Colorado River watershed you have these reservoirs called Lake Powell and Lake Mead that have - that have basically flattened out for many, many decades that variability; that's why people build dams, to basically minimize that variability -

BOB COOK: Yeah, and so -

RALPH MARRA: - so that's why those things are built.

BOB COOK: - and, likewise, I think rainwater harvesting on a local level could also be a way of flattening out because you're actually storing it. And, you know, a 12 acre - 12 inches a year, that's an acre foot for every acre in the region, so that's a lot of water. And if we're trying to fill this - this wedge, this 30% wedge either way, I think we ought to start actually looking at what the costs of that are.

You make a statement in here, "Nevertheless, rainfall could be a significant supplemental source of supply for local residents and commercial interests when it is available." Well, the question is: How will it ever become available if it doesn't become a policy issue in which we analyze it with costs and various infrastructure pieces, you know? It isn't just going to come out of the blue and be available, we actually have to plan for it and actually study it.

CHRIS AVERY: And there - let me jump in here for a minute. I think you got a point, but we are doing that. And rainwater is - you know, for example, I just helped teach a water law class - Joanna was in it - yesterday. When I took water law 20 years ago we didn't talk about rainwater harvesting at all; it was not even - it wasn't even an esoteric subject that you even had to study for on the final; now it's an issue. And there are some substantial legal issues about rainwater harvesting and - and stormwater harvesting that have to be resolved. I think they will be in - in - in near time.

And Tucson Water is engaged in rainwater harvesting studies as part of our conservation plan; it's part of the Conserve to Enhance Program that we're working on; it's something that we're interested in. But it also is a relatively - it's not a new source of supply in terms of people have been doing rainwater harvesting for a long time, but anecdotally I think you have to ask yourself, "How many cisterns did you see around town ten years ago and how many do you see today? Is it more or less? In my experience, it's a lot more.

And until the full implications of rainwater harvesting are known, until you can actually put some numbers to that data and figure out some reasonable estimate of what percentage of your future demand is going to be able to be met by rainwater harvesting and what is it going to cost, it's - it's an issue - I don't think by

any means we're minimizing the importance of rainwater harvesting - but it is one of those things, you got 145,000 acre-feet of Colorado River water; that's a pretty sure source of supply; you have 125,000 acre-feet of CAGR; that's a pretty sure source of supply. I don't quite know where to put rainwater in that.

BOB COOK: But when you made the comment that - that additional supplies of water on the CAP system are going to be in order of magnitude greater, \$800 an acre-foot to \$8,000, that creates really an area of opportunity to look at what - what other supplies we might have.

CHRIS AVERY: I don't disagree with you at all.

CHAIRMAN JIM BARRY: Vince?

VINCE VASQUEZ: Well, and just - I think - I think, you know, people are smart and when - when you start internalizing these costs and rates for acquisition, you know, rates - there's going to be upward pressure on rates and then people are going to look for substitutes like they always do, and when they go looking around for substitutes, you know, that cistern that's in the back - in the back yard is going to look good.

And I think going back to last week's paper and the discussion on the economic - you know, water as an economic resource and treating it like that, you know, that - that - that piece of using price signals and the natural ability to use those

price signals because you have to go out and acquire new supplies and what that's going to mean, is going to drive, you know, individual and collective behavior.

CHAIRMAN JIM BARRY: Anybody else? Well, let me - did you want to say something? Let me bring up a couple things. I forget what day it was. What day did we go to the AIC? A couple weeks ago, there was an Arizona Investment Council disclosure - they are utilities; they lobby for utilities - but they had a conference and the title was "Arizona's Water Now and in the Future," something like that. And I just thought that a couple things that came out from a statewide perspective are important to bring up here.

Herb Gunther, who's a director of ADWR, pointed out that many rural areas already don't have sustainable water supplies to serve their existing population, and he pointed out Mohave County, Prescott AMA, Verde Valley, Coconino Plateau in the Upper San Pedro already are - are suffering gaps between supply and demand. And Mary Castalazo (ph.), who is a researcher at the Seedman (ph.) Research Institute at ASU and also has her own marketing firm, talked about that and she's talking about the costs between now and 2032, which I believe are costs that will come online before we start worrying about ADD Water costs, but for those counties where they already have a problem, the - the augmentation costs, she estimated at \$1.1 billion. And Gunther says those counties

don't have the wherewithal to pay those kind of bills.

And she also was talking about for Cochise to extend the CAP down to Sierra Vista, for Coconino to import Colorado River water from Lake Powell, to import groundwater, to import groundwater for Gila and Yavapai. And she also pointed out that just between now and 2032, they estimate that their - between capital costs and O&M costs for water and wastewater of \$109.1 billion. So that's just what other people in the state - outside of this little Committee - are talking about. There are already people who want to get water up into northern Arizona and down to southern Arizona while we're still figuring out how to get water for the - for the three counties. So I think there's going to be competition for water. I think it's going to be a little bit tougher than - than - than we're letting on.

And I just - one other thing. One of the things you're talking about, the main- - main-stem water, is the assumption that the irrigators and the - and the Indians are going to be willing to sell their water. And at this AIC conference, Lucias Kyyitan - Marcelino? K-Y-Y-I-T-A-N, Kyyitan?

MARCELINO FLORES: Kyyitan.

CHAIRMAN JIM BARRY: Kyyitan from the Gila River Indian Community spoke and he said our settlement water resources, 63% of which is from the Central Arizona Project, will be managed as a well-rounded water-use portfolio,

will bring water resources into the hand of individual community members, and bring maximum flexibility and benefits to the community as a whole. In addition to agriculture, the water-use portfolio includes other widely varying uses such as municipal, commercial, industrial, domestic recreational and environmental. And they talk about the need to have the water so that it again becomes an asset held in common for the community. So at least the Gila River Indians don't sound like they're interested in selling what they've got, and I'm not going to be surprised. So just some other perspectives from - from a statewide conference that I thought was interesting.

RALPH MARRA: Jim, just a quick comment, and that is that I don't think there is a high expectation that the on-river Indian reservations will want to sell or - or, you know, do business with their water supply. I think the idea is it's the non-Indian agriculture that occurs along the Colorado River where the likely opportunity will be.

And I suspect that what we saw in Imperial Valley in southern California just a few years ago, the same pressures, the same forces, the same kinds of thinking will apply here as it did there, but it might be a decade away, but I think the same kinds of things will come into play.

And, Vince, the thing about the CAGR, what I remembered that was

so important, one of the big concerns that people have in the ADD Water process - and where Tucson Water and a lot of the cities are amongst them - is that the CAGR D could become a competitor with the cities for additional supplies, and - and so there's a lot of paranoia about what role the CAGR D - will the CAGR D gobble it all up? And so this is one of the issues that basically divides the participants; and, at this point in time, the CAGR D just wants to be another participant; not the king participant, the main participant that everybody has to be wary over.

But we're going to see how this process unfolds and right now we're moving into a mode where we're looking at consensus opportunities, but there's going to be places where there won't be consensus opportunities and that's when this process will become very interesting, and interesting is an interesting word, okay?

VINCE VASQUEZ: Okay. Thanks, Ralph.

CHAIRMAN JIM BARRY: Rob?

ROB KULAKOFSKY: Just a request - and this is a fairly long paper - there aren't any page numbers on it and it makes it very difficult to reference, so I request that in the future could we have page numbers? It'd really be helpful. Thank you.

CHAIRMAN JIM BARRY: I second that motion. Anybody else?

Let me make a couple of other points that I think it's important for us to recognize.

It seems to me the ADD Water process is a done deal; that's where the new water's going to be decided. We're not going to come up with our own new forum and I think that that's just a done deal and we have to face the facts.

It seems to me that ADD Water is talking about importing water. There's - I don't see that there's going to be any other issues, so that's a done deal. And I'm not going to try to pronounce it, I'll just say it, Southern Arizona Water Users Association -

MARK STRATTON: SAWUA.

CHAIRMAN JIM BARRY: - SAWUA, seems to be coordinating the activities down here and I assume that's a done deal for the moment.

But what kind of public participation outreach processes is SAWUA going through as they try to represent us in this ADD Water process?

MARK STRATTON: Well, since I don't attend the meetings, it's hard for me to say. But, Dorothy, you're there, so . . .

DOROTHY O'BRIEN: Good evening. I'm Dorothy O'Brien with Marana. At the SAWUA meetings, we do discuss ADD Water. Frequently, attendees have included Cathy Chavez with Pima County, Brad Dispain in his prior position which I have taken with utilities, and Warren Tenny with Metro, as well as

Chris Ward with -

MARK STRATTON: Avraco.

DOROTHY O'BRIEN: - Avraco. So there have been a variety of people that have attended the ADD Water meetings. Last week when it was determined who was going to be in the - the Hammer it Out Group, those of us from the Tucson region were very outspoken to try to make sure that during the Hammer it Out Group that there was an equitable amount of individuals from this region on the ADD Water Hammer it Out Group as there was from the Phoenix metropolitan area, because the - the needs here are dynamically different.

As Chris stated, others outside the tri-county area have started coming to that - to that entity. So we do anticipate that it's going to be more than just the tri-county area looking to ADD Water to be finding out who - what water sources are available.

So, as far as how SAWUA's attending, it's whichever members can attend. We currently have attending the ADD Water will be Chris, and I believe Ralph is the alternate for you, myself and my operations manager is my alternate, and then Chris Ward and Phillip Soletta (ph.) will be the other two who will be attending. So we're trying to make sure that during our Hammer it Out process, which really will be the next big stage before it goes forward to the Board, and I think

they're anticipating it moving forward to the Board in January? In January. So, hopefully, that answered your question.

JOHN CARLSON: What Board?

CHAIRMAN JIM BARRY: Yeah.

DOROTHY O'BRIEN: The CAP Board. They want to bring the ADD Water process back to the CAP Board in January of next year.

CHAIRMAN JIM BARRY: Okay. Thanks. Let me ask one other question on - on the paper. I guess it's Recommendations Number 2, Tucson Water should take the necessary steps to have additional more reliable water resources on hand well before 2025. What do you mean by "on hand?"

MARK STRATTON: Secured.

RALPH MARRA: Secured. So, in other words, this ADD Water process -

CHAIRMAN JIM BARRY: Physically available?

RALPH MARRA: Well, that we have entitlement to it -

CHAIRMAN JIM BARRY: Okay.

RALPH MARRA: - okay? And since you have CAP infrastructure that's available, that's your physical ability to make that entitlement into wet water that becomes available to you - to us should there be a shortage by 2025 or 2030.

But Tucson - I have to just say this just to kinda give people a sense of things - there is no dire emergency here; that, basically, we have a huge portfolio of water resources that we can ride out a very significant shortage on the river for decades, okay? So there isn't a sense of urgency that we have it like on hand immediately. We have a lot of room, a lot of flexibility; in fact, we probably have more room and flexibility than a lot of our sister cities in the Phoenix area that are built on treatments plants, and if you have a shortage on the river then how much water's going to be coming to your CAP treatment plant, okay? We have a lot more flexibility because of recharge and recovery facilities and we've been storing a lot of water in the subsurface; that's our bank account. And so we've created flexibility for ourselves; that's the reason why we went that direction.

CHAIRMAN JIM BARRY: And I agree with that, and I agree that we're in pretty good shape for the . . . period of time.

I just worry - look, I'm 67 years old. Twenty years is only a third of the time I've been alive; that's not a very long time, you know, or 30 years is - is a little bit less than half. I - I - I think that - that 30 years is - we've got that kind of - maybe 40, we probably got that kind of flexibility, but if we aren't - if the community isn't aware now that we've got to be making decisions now to take care of what's going to happen in 30 or 40 years, we got 40 or 45 years to try to come to Safe Yield? We've

peed away half of it already; I mean, we're - we're on the cusp of not being able to do that. You know, you can - we can waste a lot of time. I - I'm not saying that Tucson Water's going to, but there are so many other players in here that I just think that we need to have a greater sense of urgency to be planning now; to be informing the community now; that's - that's my only point.

RALPH MARRA: And I think the response there is, is that we are planning now and I think the whole point is that we are engaged in the ADD Water process now. We're looking at the need for additional supplies many years into the future. I think the point here to make is that there's no reason for people to be fearful.

CHAIRMAN JIM BARRY: I agree.

RALPH MARRA: There's no reason for being worried, and that's the point that I'm addressing here. But, yes, the planning begins now and it will continue, you know, until these additional supplies are secured.

CHAIRMAN JIM BARRY: I agree. I'm just saying that I think the community ought to be more aware of the planning and the need for planning.

Bob, do it quickly and then we're going to move on to the next paper.

BOB COOK: Yeah, the reason I think that sustainability as a theme needs to be central to the Phase 2 report by the Committee is not because we have

volume issues in water sustainability going forward into the near and medium term, and I think the argument was - is well made.

As far as potential sources of water in our portfolio that's available to us, it's not a big threat. What's really a threat in terms of sustainability is financial and economic sustainability. And if we view these - whatever investments we're going to be making in the water and wastewater field, it's got to be evaluated in the context of a broader financial sustainability and economic sustainability, and I hope we move in that direction because that - that's really the metric that makes any difference. Just having water available is not the sustainability answer.

JOHN CARLSON: Jim, I had my hand up before him, but I'll be a lot shorter than he is -

CHAIRMAN JIM BARRY: One last comment and then -

JOHN CARLSON: - if you let me speak.

CHAIRMAN JIM BARRY: - we're going to move on.

JOHN CARLSON: I heard somebody mention something about the possibility of water going to the Upper San Pedro down near Tombstone and this is ancient history, but when Mo Udall and all that was working on it, there was a canal down there and all of a sudden they got eliminated and they said, no. So what type of chance or right is there that water would go down there? I think -

CHAIRMAN JIM BARRY: All I wanted to report is somebody is thinking about it and I just thought it would be wise for us to be aware of what other people in the state are thinking about. I have no idea whether that could happen.

JOHN CARLSON: Whether there's any right to it or not?

CHRIS AVERY: They're going to need to find water to put in the canal before they decide to build it.

JOHN CARLSON: Well, I understand that, but I just wondered if -

CHAIRMAN JIM BARRY: All right.

JOHN CARLSON: - somebody had the right to the water.

CHAIRMAN JIM BARRY: Ralph and Chris, thank you very much; that was very, very important.

(Applause.)

CHAIRMAN JIM BARRY: It's 7:30 and we have two more presentations to go. We'll take a quick break and then let's just push through 'em, and I'm going to start controlling the amount of questions so that we get through all - both of them. All right. Five minutes.

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(Recess taken at this time.)

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CHAIRMAN JIM BARRY: Okay.

SUZANNE SHIELDS: I'm Suzanne Shields, the Director of the Regional Flood Control District, and Leslie Liberti, the Director of the City of Tucson Office of Conservation and Sustainable Development?

LESLIE LIBERTI: That's (inaudible).

SUZANNE SHIELDS: Will be making the presentation tonight and we'll try to keep it fairly short. We know when we prepared this paper, Water for the Environment, we knew it was going to be a tough paper to prepare. There's a lot of different, varying opinions when it comes to water for the environment, and I think it's one reason why our paper's a little long, but we do have page numbers, so try to help there.

We tried to put all of this into contents (sic) of what is within the Tucson metropolitan area. When Pima County is looking for water for the environment, sometimes people mistake what we're looking at. Keep in mind when we're talking about our multiple-species plan, we're everything from the top of Mount Lemmon and Summerhaven and down to Organ Pipe in Ajo, so we try to focus in on what is in the metropolitan area. And water for the environment is not just water for riparian habitat, but here for Chris Avery, I have a burrowing owl - we - the environment, a healthy environment, includes the uplands.

I'm just briefly going to introduce what we're going to talk about.

Leslie's going to speak and then I will finish up. But, to simplify our questions that we thought the Committee wanted us to address into three areas: Why are projects that improve the environment important? Why are we even doing this? How and where - how and where do we do environmental projects or preserve environmental aspects of our - of our land? What's the best use of various water types? We didn't want to just focus on reclaimed water, we looked at - tried to look at a variety of different water types, recognizing, though, that we do a stormwater paper earlier to you, as well as a shallow groundwater paper. How can we best preserve and improve ecosystem functions? Sometimes just a little bit of water can make the difference in the value of a habitat. What might our future opportunities to do environmental projects be, both for existing and future water resources? And then, regionally, as with many aspects of what you're studying, what regionally - what kind of standards and goals should we set regarding use of reclaimed water for the environment? We recognize it's a valuable resource. We recognize over time there's going to be more demand for it. So these were some of the basic questions that we tried to answer in the paper for you.

LESLIE LIBERTI: Thanks, Suzanne. And I know I don't need to go into a lot of detail with this group about how important riparian habitat is; it's critical

to the functioning of our ecosystems, even though it represents less than a half a percent of the total land area, just in terms of its - it's environmental function with floodplain management and groundwater recharge and habitat for a significant portion of the vertebrate population in the State of Arizona. But it's got value just beyond that - that environmental aspect; it's really important to our community from the per- - perspective of quality of life, a lot of people like to recreate in riparian areas; it has a really important function for an urban context as urban heat island mitigation, and it has a lot of economic value to our region as well.

Eco-tourism alone, wildlife and birding in Arizona in 2006, brought in almost \$400 million to the state, so it's a really important component of our local economy. And we've seen that homeowners are willing to pay more to live near riparian habitats; and, not only that, they're - they tend to use less outdoor water when their properties are adjacent to areas with naturally lush vegetation.

We wanted to talk just a little bit about types of riparian habitat because it's important to understand that we're not just talking about riparian habitat. There's a lot of variability in what we're referring to, and the water needs associated with that can be dramatically different from the low end in xeroriparian to the high end in hydroriparian, you're talking like a six-fold difference in - in the water needs. So, when we talk about restoration, we have to be really careful to emphasize what

type of restoration we're referring to.

And I want to give a nod to Suzanne about the burrowing owl plug. We do recognize the importance of uplands but, from these numbers, the - the one to half of one acre-foot per year, you can see uplands should be sustained just on natural rainfall. So there was a portion of the paper that did talk about just general land preservation, but for the bulk of the paper we really focused on riparian habitats where you needed some additional water input, whether it was naturally through, you know, ephemeral streams, concentrating flow, or through shallow groundwater or, you know, perennial flowing streams or, in the case of restoration, where it's artificially supplemented.

Water for environment really implies that there's some sort of human intervention in the ecosystem. On the preservation side, we're really talking about taking an existing system and trying to remove threats from that system. And we really want to start there. Restoration certainly has its place, but the reality is we can't recreate natural systems. We, quite honestly, aren't as smart as Mother Nature. And so we've got to start there and that's really the underlying focus of any kind of riparian preservation/restoration program.

The cost of doing so is variable. At the high end, we're talking about acquiring natural riparian habitats which can be fairly expensive; but, on the other

end, we have a lot of regulatory opportunities that we can employ, local ordinances that preserve riparian habitat, and it's a relatively low-cost option.

There's also opportunities to remove threats by removing ways in which people pull water from shallow groundwater areas; areas that do have a natural water supply that's somehow threatened.

On the other end of the spectrum, what we're doing is trying to replicate a natural system that's either been degraded or lost; that's the restoration aspect of it. The cost here is also variable, but what's important to note you always have a higher O&M cost because you're not talking about a natural intact system. And, particularly, once you get out of like the xeroriparian realm of habitat, that O&M can be incredibly expensive because it's usually ongoing inputs of water and other fairly intensive resources.

When you're talking about constructed restoration, you got to have a place to put it, so it's land; it's usually water; it's the infrastructure to provide that water. There may be water treatment components, so it's not something that we go into really lightly, you know; it's something we have to think about carefully because there's a great deal of investment that's involved.

So, when we're looking at doing restoration, we need to think about why we're doing it. What's the purpose? What are we trying to accomplish here?

What's feasible in a particular location and what's the most cost-effective approach to getting there?

So, just to talk a little bit about the why and for what purpose, we had this section that really focuses on the context for why we do it; this drivers discussion. One set of drivers for municipalities is regulatory, both the City and the County are developing habitat conservation plans; those are plans by which we look at how we are going to potentially impact sensitive species in our region, and look at ways to mitigate those impacts, including dealing with environmental changes that may occur over time.

There are a number of riparian-obligate species. There are a number of riparian-dependent birds in both of our plans, and there may come a point where . . . so I guess that's the sound of a battery dying. There may come a point at which we have to do things for specific species - example, a water-obligate like the Huachuca Water Umbel - to meet our regulatory requirements. We also do restoration within a context of water quality permits, 404 permitting.

But I don't want you to get the idea that we do restoration just because we have to. There's a lot of opportunities that present themselves, a lot of reasons we do restoration just because we can, and those are typically situations where resources are available in the right context and at the right time and place for us to

be able to capitalize them.

There are a lot of instances where we're doing multiple benefit projects, where we need to do something to do - flood control or stormwater management or there's irrigation infrastructure associated with a park; those are opportunities that we can add restoration as an element, and that has been an important driver for a lot of the projects that both the City and the County have undertaken.

There are grant opportunities and other partnership opportunities that have come about. Atterbury Wash, the City - Tucson Audubon Society was able to get several hundred thousand dollars to do restoration there. The - the County has got a number of - of grants and - and federal funding opportunities that they've been able to utilize to do projects. And it's also not just the municipalities; it's not just the City and County. We have local regulatory frameworks that enable us to preserve and ask for restoration within individual developments. So, just to give an example of - a specific example of how these drivers induce restoration on the part of a municipality, I'm going to turn it back over to Suzanne.

SUZANNE SHIELDS: We try to provide some examples of our existing and future projects, but I think Swan Wetlands is a project the County built along the Rillito is - shows you how you have to have many building blocks that you - that you

consider as you're putting something together, and it's not just because we have money for the project. Actually, we envision doing a restoration project in this area even as we're building bank protection and purposely did not build bank protection in this area.

We have our River Park system there; it provides an other open landscaped area that's an amenity to our River Park system which is used by countless people, both citizens and visitors. There's available reclaimed water. The linear park has, of course, a reclaimed water line system. And stormwater, part of this restoration area was a former sand and gravel pit and so it's low-lying; it's low-lying adjacent to the river; it gets flooded; and we had major tributaries coming off from - from the City side. So, recognizing that there's always stormwater runoff and it's concentrating in the major rivers, those provide us with opportunities for water.

It also was adjacent as you're - Swan Wetlands area is really from Columbus to Craycroft; that's an area where the Tanque Verde/Pantano/Rillito already have some healthy vegetation and you have the - the upstream tributaries for the Catalina Foothills, so it was an enhancement of those riparian areas; and, importantly enough, we got federal funding which helped us implement the project.

Besides the drivers, the elephant in the room is the exception. We have the effluent-dominated Santa Cruz River which is, by itself, a type of

environmental project; perhaps, wasn't meant to be, but it is; it is a fairly narrow band of - of riparian habitat and it serves a very valuable - for migratory birds, as well as part of our biological corridor.

As I said, it's incidental habitat. We got to look at it. We got to think about it. But there's no associated commitment to supply water; in fact, a lot of this habitat is on somebody else's property; it's not property owned by a public entity; some of it's owned by the Flood Control District, but most of it is not.

There's a lot of uncertainty. We don't know if or when the effluent might be removed or how much effluent might be retained as continual flow, intermittent flow. We keep talking about the effluent as if it's a fixed amount that comes out every hour of the day, when really there is seasonal and diurnal differences.

There may be some future legislation, policy or administrative things that change, plus it's complex. Not all the water will be taken from Ina Road or Roger Road simply because of ownership, the infrastructure there. Where's the best place to recharge it? That depends on - on the geology and hydrology.

Our biggest unknown - and I pulled this actually from a presentation by the Bureau of Reclamation - is what is the future for the Secretary of Interior water? Their identified preferential uses for the water is first legislation. They would be

more than happy to get 100% recharge credits for their managed recharge. They're also looking at in- - in-channel constructed recharge. For the most part, that's in the downstream area in the Avra Valley area, and outside either constructed recharge or used as groundwater savings facilities which is another way of saying sell it to the farmers if they're using groundwater.

So if you really look at the river and you say (inaudible) to me the worst-case scenario - and this is going to sound strange to some of you - the worst-case scenario is that in a couple years we have 90,000 acre-feet running down the river; it's the worst case from Flood Control and riparian habitat protection because the subsidence in the Pinal County area is creating tremendous head-cuts along the Santa Cruz River. Most of you, if you drove over it on I-8 you wouldn't even know where the Santa Cruz River is; it's really flat. It's very concerning to me that water would flow and we would get head-cuts because it would really affect both riparian areas, as well as our flood control structures.

JOHN CARLSON: What is "head-cut?"

SUZANNE SHIELD: Head-cut, the - the ground is subsiding, going down; it's making the ground steeper. And so the river is here, as the ground goes down it cuts back in, so you're getting something that looks like the area that's upstream, say, by Valencia Road on the Santa Cruz River, so it's - in sizing, it's

getting deeper and deeper due to the change in slope from subsidence.

If you look at it from a common-sense perspective and the white line is, if you will, the groundwater divide - the - the Rillito narrows, there's not that much opportunity in the Tucson Basin to do additional recharge. Our primary recharge areas are located near Sanders Road. The Santa Cruz River is the most cost-effective way to transport the water to these recharge locations. So, most likely, at least from Ina to Sanders, there will be water in the river. There's also the question of seasonality and diurnal flow. Most likely there will be some intermittent flows.

I'm trying to paint a picture that it's not going to be all water in the river, nor is it all going to be shut off a tap and it's the Sahara, but we don't know what's going to happen. We'll have to plan for it.

What's easier for us to plan for, sometimes, is our environmental restoration projects, but it is a planning and one of the planning things that we look at - and we try to stress that in this report - is that in every case we try to look for low-water use, using of - of, you know, stormwater wherever possible, but we have to define what the need is, what we're going to serve, land availability, whether you're in a urban or rural area.

In an urban area - and I'm going to have pedestrians walking by - I'm - have to be aware of what kind of habitat I can provide. There's (inaudible) controls.

There's public safety. There's wildfire concerns. Rural areas are a little bit simpler and have more opportunity for passive-type of restoration versus active.

We want to look at where we're doing multiple benefits. We want to make sure we have stormwater quality benefits and we have to look at water needs and availability. The water planning issue - and I'm not going to go through the whole length of where the waters are - but when we do a restoration project you usually just have your establishment period; that's probably the most important and you ideally plan that you can take them off water.

Seasonal or supplemental water needs may become more important even in existing habitats as we go into a drought. We have to see what's available just because there's - we talk about reclaimed water - if there's not the infrastructure to bring it to an area, you're not going to be able to use reclaimed water. And then, of course, cost: cost of delivery; cost for the service; cost for the treatment.

Leslie is going to present what we feel is a good qualitative way of looking at opportunities.

LESLIE LIBERTI: And Suzanne's point about this being qualitative is very true. You notice there's no numbers; there's really nothing to anchor that. So don't think of this as being the - the slope of the line really matters on this graph.

Suzanne alluded to the fact this was a fairly difficult paper. Ah, some

of it was slight differences in opinion, but a lot of it really was - you've heard what she - what she just presented in terms of how you plan a restoration project, and all of a sudden as - as Staff were trying to come up with a systematic way to present this and grappling with all these different reasons why we need to and we want to do restoration, all the different types of restoration types and the associated water needs of those, and a really, really large and dynamic region, and it was really hard to try to get our heads around a systematic way to look at how we're going to undertake restoration in the future, and this chart came out of these Staff discussions.

I'm going to walk a little bit so I can see this easier. So it's - it's trying to get a couple of things across: First of all, as you - as you start at this end and go to where it says "Hydroriparian," it's - it's kind of that continuum of how much water is needed for a particular type of restoration. So if you see the - is it blue line? - curving up, that's really getting at the fact that these various types of restoration as you move outward take considerably more water per acre to be successful.

On the red curve, what you're really getting at is that the opportunities for restoration at this lower end, this - riparian types that take little or no additional water - you've got a lot more opportunities and that's not just because they have such low-water use, it's that hydroriparian you have to have particular hydrologic and

soil and geologic conditions to be able to do hydroriparian restoration. There's a reason why in the natural environment we have much more xeroriparian habitat than we do hydroriparian. So, even not accounting for costs, the feasibility of doing riparian habitat restoration, our options are much more limited.

So, as we started looking at that and overlaying with it the reasons why we do restoration, we started to realize that, you know, at this end where we don't need a lot of supplemental irrigation, where we can accomplish the needs of restoration through stormwater, we should be doing it whenever we can. So this really represents - we should be taking advantage of all those opportunities because it doesn't take very much water per project.

As you move out towards the other end of the chart, this is where you're talking a pretty significant capital investment in a lot of cases. We're talking significant supplies of water to maintain or create habitat, and here's where you really get into those regulatory drivers; things where we may have to create hydroriparian habitat to support our riparian-obligate species that's in the County (inaudible).

It also includes situations where we have existing hydroriparian habitat, in some cases mesoriparian habitat, because they are relatively rare with respect to xeroriparian habitat. They're incredibly valuable. And, in cases of drought or in

cases of climate change, we need to be prepared to provide supplemental sources to ensure that we don't lose those critical areas.

Coming back a little bit from there. Where we have opportunities, some meso-type habitats where you can't support 'em just on stormwater, you have to have some kind of dedicated water supply, we started thinking, we do a lot of projects that have a dedicated water supply or associated with some kind of water facility; they're public projects; they are recharge facilities; they're wastewater treatment facilities; they're stormwater basins; they're linear parks with irrigation. And, as public entities and having that circumstance, we should be looking at every public project like that, that has that dedicated water source, as an opportunity to do restoration.

And then stepping back a little bit from that, where we don't necessarily have a dedicated water supply associated with a multi-purpose project. I think I should've taken this out. What we do have are a lot of resources in this community. We've got the Conservation Effluent Pool. We don't have an IGA in place, but we do have the pool. We've got expert expertise - Kendall with Tucson Audubon is sitting in the back - and Audubon's done incredible work for a number of years. They have not only expertise resources but financial resources associated with their 404 in lieu mitigation program. The City and County both have in lieu programs, so

we have some amount of funding available for restoration. We have sources like the Arizona Water Protection Fund Grants. There's a lot of pieces that we can put together to look at focusing on restoration opportunities that need something more than just stormwater to survive, but don't necessarily - aren't necessarily associated with a dedicated water supply with a multi-use project.

So that's kind of how we envisioned this - this structure for how we're going forward with restoration in the region, and you'll see that reflected in the recommendations that Suzanne's going to talk about.

VINCE VASQUEZ: Leslie, real quick. Is hydroriparian the same as what the County calls the "groundwater dependent ecosystems?" Is that - does that fit the same classification?

LESLIE LIBERTI: I'll let you answer that.

SUZANNE SHIELDS: Typically, yes, it's the meso- and hydroriparian. Some groundwater - channeled groundwater or cienegas that might - the groundwater's only shallow at certain times of the year; but, typically, yes, the higher water use.

VINCE VASQUEZ: So it doesn't have to be a - and, essentially, you don't have to get back to a groundwater dependency condition, I guess I'm saying, to achieve that project? Is that - or do you - do you?

SUZANNE SHIELDS: Okay.

VINCE VASQUEZ: If you were - if you were to achieve - try to achieve a hydroriparian - riparian restoration project, would you - to - to really successfully get it back to its - where it wants to be, does it have to be groundwater dependent? Meaning, the groundwater level you have - you have to have risen it to the - where the plants can actually touch it?

SUZANNE SHIELDS: No, what - what you have to do is provide an equivalent amount of water, and that's one reason - it's partly water availability, but it's also - do you have the right combination of things.

Kino Environmental Restoration Project has both hydroriparian; it's got, you know, wetlands, as well as upland. But, in those wetland structures to achieve the same thing, we had to create impermeable layers at - at a certain depth below what the future root zones were going to be.

VINCE VASQUEZ: So you would need long-term dedicated supplies to -

SUZANNE SHIELDS: Yes.

VINCE VASQUEZ: - sustain a hydroriparian?

SUZANNE SHIELDS: Yes -

VINCE VASQUEZ: Okay.

SUZANNE SHIELDS: - either natural or artificial. And, if we're looking at this for the whole region, how you might divide up water, keep in mind that each restoration project will have a combination. If Kino Environmental Restoration was not also using the stormwater for watering playground fields, we could probably only use stormwater for the hydro (inaudible).

VINCE VASQUEZ: You could saturate it with the stormwater - if it's collected in a great enough amount, you could saturate that area enough to create the hydro without supplemental irrigation with -

SUZANNE SHIELDS: Yes.

VINCE VASQUEZ: - reclaimed? Thank you.

SUZANNE SHIELDS: Okay.

CHAIRMAN JIM BARRY: Suzanne, just to - we got ten minutes left on this presentation.

SUZANNE SHIELDS: I'm - I'm going to -

CHAIRMAN JIM BARRY: Okay.

SUZANNE SHIELDS: I'll go through it quickly.

CHAIRMAN JIM BARRY: Okay.

SUZANNE SHIELDS: I understand, Jim. I'm sorry.

I guess I get to talk about the big ones. The other question that was -

something that was kicked around was the Conservation Effluent Pool, and the way we all - in - in discussions of Staff - like to look at it is it's a bank account; it's a bank account for environmental projects; it doesn't - in fact, it was set up so that one of the specifics is that Tucson Water would guarantee the water for five years for a particular project. The idea is it's to establish a project. So probably the best buy for the Conservation Effluent Pool is once you choose a project, if - if you can get it off the effluent pool in five years, then you can do another project and then you can do another project and then you can do another project.

So there is an idea of how we decide on our projects, what type of projects because you don't want to just make it a deficit from that account. We can do - we don't know what our long-term water needs are going to be, but that doesn't mean that we can't establish new habitat in - in the short-term that is sustainable.

I'm going to miss most of that. We were trying to look at opportunities. Quickly, the City and County own a lot of land that are some areas that we can do restoration, both passive and active. Reclaimed - and I said "effluent" because we have our wastewater treatment plants in outlying areas that also provide us with opportunities, and based on that is how we would come up with both environmental project opportunities, some of these are existing, some of these are future, they may or may not happen. Some of them are - like the Bingham Cienega, have nothing to

do with the Tucson Basin, but it's a process that we go through.

Water for the environment is important. When I think of water for an environment, I even think about the runoff and the rainwater that hits our natural washes. We need to preserve those. They're an essential function for our floodplains and for groundwater recharge. Thank you.

Oh, recommendations. So fast, Jim, you scared me.

CHAIRMAN JIM BARRY: Oh, there's a first.

SUZANNE SHIELDS: I summarized these. I'm not giving them all. One is to develop some regional policies. We - just as we do for water for other things, we need to do regional policies. Use water harvesting to support restoration whenever and wherever possible. Incorporate restoration into public projects where feasible. Make some contingency planning about the future, whether that be from threats of long-term drought or looking at the Santa Cruz River. We have time to plan. We have time to - to make - do the necessary studies to do the right job. And, again, do partnerships and combine our resources so we maximize the environmental social benefit while minimizing our costs.

CHAIRMAN JIM BARRY: All right. Let me suggest that we have two short questions and then we'll go on to water quality. Bob?

BOB COOK: Yeah.

CHAIRMAN JIM BARRY: Two short questions.

BOB COOK: Yeah. Looking at possible funding sources for these sorts of projects, I was reminded of the whole issue of climate change, mitigation, climate change, adaptation. There's - there's under consideration globally now the transfer of funds from industrial to developing countries that would be most impacted by climate change. Climate adaptation, as - as you know Leslie, is - is gaining as an issue. Why don't you consider the carbon tax or other, you know . . . strategies like that as one of the funding sources for - for - for restoration when, in fact, climate adaptation and ecosystem restoration are going to be closely linked?

LESLIE LIBERTI: Because that's probably a little premature given our climate change mitigation and adaptation planning. The City - I don't know if you are - everyone's aware - does have a climate change mitigation and adaptation planning process. We have an incredible advisory committee that's assisting us. We're pretty early in the process. We're just getting to the point of taking mitigation strategies to determine what kind of analysis we're going to start doing to start winnowing down different ways to reduce our - our greenhouse gas emissions in this region, and we're just - just this week beginning to wrap our heads around the adaptation pieces. So there are going to be recommendations.

You can't really look at something like carbon taxing just in the context

of riparian restoration, but it's going to have to be part of an overall mitigation and adaptation strategy which is something we're trying to get to. So the answer to your question: It's something that's being considered and part of my hesitance is we don't know what's going to happen at the federal level. What happens with the Aces Bill is really going to potentially radically change the playing field here, so we're kind of waiting to see what happens there.

CHAIRMAN JIM BARRY: Anybody else? Chris, did you want . . . ?

CHRIS BROOKS: Yeah, the section of the paper that talks about legal issues and water rights, you talk about whether or not you need an appropriation right to capture stormwater and put it into a detention basin. The reason that you don't have to get a right for that because - is it because you're not putting the water to beneficial use under state law?

SUZANNE SHIELDS: That's correct. You can detain the water and let it go out for purposes of flood control, but as soon as you put it to beneficial use then you have to start thinking about do you have a water right, surface water right to it?

CHRIS BROOKS: But if you're using it for environmental restoration that is not considered beneficial - beneficial use under the law?

SUZANNE SHIELDS: That's considered beneficial use. So, at Kino Environmental Restoration, we did acquire water rights.

Now, we have other detention basins that, oh, by the way, because we slowed down the flow, we get . . . plants growing - some of them are pretty healthy, even with cottonwoods - but we did not intentionally design it and do it in that fashion.

CHAIRMAN JIM BARRY: Time for one more. All right. Let me make a recommendation to Staff - not to you two in particular - the scope - thank you very much, Leslie and Suzanne.

(Applause.)

CHAIRMAN JIM BARRY: I just want to read from the scope that Mayor and Council and the Board gave us on respect for the environment. They talk about certain reservations - of certain water reservations for the environment must be made and sustained. Acknowledgment of this goal must be stated in words and translated into action. I would just suggest that as Staff writes its report that they look to see that they're addressing that, as well as all of the other things they brought up.

All right. Water Quality. No Water Quality?

MARK STRATTON: Don't everybody . . .

CHAIRMAN JIM BARRY: Oh, not Curley. You're not on the list, Curley, doggone it.

NICOLE EWING-GAVIN: Which one do you want first, Ed? The regular one? You don't want the (inaudible) notes? That sounded so good.

CHAIRMAN JIM BARRY: Let me talk to the panel here. It's 8:15. I'm going to really try to keep this to 35 minutes rather than 45. Thank you.

ED CURLEY: Yeah, we'll try and leave some time, Jim, for questions and then for wrap-up by yourself.

Why are we here? Because during Phase 1 last summer, the Committee requested that Phase 2 include a more-detailed look at water quality issues; particularly at the issues with emerging contaminants. So the paper that we submitted to you divided this task into three sections, and we're going to follow that outline in our remarks tonight.

Okay. The first portion we give you is going to talk about what the - how the water quality of - regulatory works. We gave a little bit of that last time and we're just going to briefly review it.

Then Steve Dean, who's the Interim Water Quality Administrator for Tucson Water, will present the Water Quality Program for Tucson Water and specific water quality issues that Tucson Water has or is dealing with now. Following that will be Jeff Prevatt, our Manager of (inaudible) and Regulatory Affairs for Wastewater, and he'll present the RWRD Water Quality Program and our water

quality issues. And, finally, Jim Dubois, the Principal Hydrologist for Wastewater, will present the background issues on human health and environmental concerns with emerging contaminants.

We'd also like to acknowledge in the audience Bob Arnold with the U of A Environmental Engineering Department. Bob has been involved with emerging contaminants research for the last ten years; gave us a lot of tremendous research and background information for the paper and served as our technical reviewer.

So now on to framing. One of the things we thought we'd start out with was the concept that sanitation is a medical advance in the last 150 years. You see the *Harper's Weekly* illustration, "Sowing for Diphtheria," disposing of your slop outside your house, and the open sewer in Pittsburgh in 1909. You know, some of you in the room may have seen that open sewer in Pittsburgh.

Also, the issue now with *Cryptosporidium* in 1994 in *Giardia*, a continuing problem for daycare settings let you realize that we are not out of the woods with dealing with the human health issues for waterborne diseases. This is a constant struggle and this is what water and wastewater agencies do.

Here's the structure we do it within, is that the EPA develops regulations, the state issues permits based on those regulations, enforces the compliance. We, in Tucson Water and Pima County Wastewater, implement

regulatory requirements. We have treatment technology to address pollutants. We have research to improve our detection. We periodically evaluate all the research data and EPA improves the standards. So the standards are typically in every evolving guideline; they're frequently increased and you end up funding improvements to do with standards that didn't exist when you built the original facility, so it's a continuing chase.

The major regulations are, of course, the Safe Drinking Water Act, but you have to realize that there's a super-fun component - and that's going to be talked about a little in the Tucson Water presentation - and wastewater deals with the Clean Water Act and then all the rest of them are state implementation programs, discharge permits, aquifer protection permits, reuse permits, and even biosolids is regulated by the Clean Water Act.

Emerging contaminants or their new name "Contaminants of Emerging Concern," are chemicals that have been showing up more in scientific surveys because of improved analytical capacities; they may have public health or ecosystem risk; and typically they have no standards.

So I'll turn it over to Steve to talk about the Tucson Water Program and their issues.

STEVE DEAN: Thank you, Ed. Again, my name's Steve Dean. I'm the

Interim Water Quality Administrator for Tucson Water. And what I'd like to do is provide a brief overview of the Tucson Water system, how Tucson Water continues to maintain and meet the regulatory compliance, water quality best management practices that Tucson Water has, Environmental protection programs that Tucson Water continues to move forward with, special projects, our public outreach, Tucson Water's current challenges, and Tucson Water's multi-barrier approach that we continue to have in place.

Tucson Water's ground - groundwater system is one of the most largest and most complex in the United States. We cover - our service area covers over 330-plus square miles. We have ten public water systems. We have one huge main system with nine stand-alones. We provide water to over 175,000 customers. We have 215 active production wells which represents approximately 212 million gallons in capacity. We have 145 booster stations. We have three treatment facilities. We also have 65 storage tanks which represents over 200 million gallons of capacity. We have 408,000 - 4,800 miles of pipelines and we average approximately 100 million gallons a day throughout the year, approximately 130 through the summer and 70 MGD through the winter.

Need to go back. Sorry. Won't let me do it. Okay. Our Potable Water Compliance Program. These two pie charts represent the primary drinking water

constituents; this represents the monitoring year of 2007. On the left, we took over 3,000 total Coliform tests. The pie chart on the right is we - these include our SOCs, IOCs and VOCs. We took over 16,000 tests which represented a grand total of 19,000 tests; the cost to Tucson Water approximately \$1 million in the year 2007.

Oh, there it is.

Okay. Our Wellfields and Recharge Facilities, we have our CAVSARP and our SAVSARP recharge basins. We have our recovery wells. We also have our Central Wellfield and we have what we call our "TARP Treatment Plant Facility" and our conventional groundwater wells.

Water Quality Best Management Practices. Tucson Water has some internal policies in place which are much more stringent than EPA and ADQ guidelines. Internally and discretionary, we monitor for volatile organic chemicals based on different percentage levels of the MCL; same thing with the control of drinking water wells for there's potential for exceeding the maximum contaminant levels.

We also have an inactivation and deactivation program for our wells that we do not run throughout the year. Also, we have operation new source wells that exceed MCLs or alert levels. Again, these are all internal Tucson Water policies and they are much more stringent than ADQ guidelines.

Our Water Quality Lab. We have our own laboratory that's licensed by ADHS. We have a staff of 19 personnel. We have water quality analysis. We have chemists and supervisors and managers. This laboratory, for the most part, can sample all the primary drinking water constituents, some of the secondary and some of the emerging. We do have to sub out some water quality analysis, such as SOCs and radon.

Reclaimed Water Quality. Tucson Water has a reclaimed water treatment plant located off of Sweetwater Drive just west of I-10. Tucson Water has a Type 3 general permit from ADQ and we are designated reclaimed water agent.

We also have two - two aquifer protection permits; one for the plant itself and the other one for the recharge basins. And what we have to do is monitor real time for turbidity and we also sample for (inaudible) viruses, metals and fecal Coliform. Class A water is pumped out into this system. We can pump up to 32 million gallons a day during summer peak demand.

Here's our sources. We have a wet well that we grab diurnal flows from Roger Road. We have a 10-million-gallon-a-day treatment facility which has (inaudible) filters. We have recovery basins and extraction wells which will (inaudible) - meaning the 32 MGD peak demand in the summertime.

We also are involved with Tucson Water as a stakeholder with the

TARP plume. Back in the early '80s, TCE was detected in some wells in the southern part of the region. And what this map depicts is the Tucson Airport Authority - back then it was Hughes, now it's Raytheon and Texas Instruments - Tucson Water is mitigating and actually recapturing the plume in Plume A, which is north of Los Reales Road all the way up to Irvington. The TCE plume is approximately a mile and a half wide by three miles long. We're under a record - a decision, a consent decree, to pump, treat and deliver, and the beneficial use in this aspect is potable drinking water.

We also have a 1,4-Dioxane plume. This here is an emerging contaminant; it's also on the CCL list which is the contaminant candidate list and the existing vapor phase aeration system at TARP does not treat 1,4-Dioxane, so since 2003 Tucson Water's been managing and mitigating the 1,4-Dioxane levels being realized at the point of entry by blending. The health advisory is three parts per billion, and with blending strategies we have been able to manage two parts per billion going into the customer base to date.

Backflow Prevention and Cross Connection Control; this is part of our Environmental Protection Program. Tucson Water has a dedicated Backflow Protection Program and dedicated staff, and we have a nice website. Tucson Water, in our opinion, is the leader in not only the state but in the nation for this type

of program.

Tucson Water in 2008 began what we call a Sentry Program. We test for micro-constituents at wells in close proximity to the Santa Cruz River and also two of our other wellfields, and what we're continuing to do is run annual samples to make sure that we are seeing any detection of pharmaceuticals or personal care products.

Public Outreach. We have what we call "EMPACT," which is our Environmental Monitoring for Public Access and Community Tracking. This particular slide here is our water quality website. Customers can go on our - our Tucson Water website, they can click on their water zone and they can click on the lefthand side of this - this slide here, supplier distribution, and it'll give them the actual water quality and water quality constituents and fill parameters of the water that's being fed to their house.

Here's a slide that reflects that. They clicked on the water supply sources in a particular zone and it'll show all the different water quality parameters from the Clear Water Supply, our Avra Valley Wellfield, the Santa Cruz Wellfield, the Central Wellfield and South Side and TARP, and these are updated - this one here's for the most recent 16-month period.

JOHN CARLSON: What's "in progress" mean?

STEVE DEAN: Pardon?

JOHN CARLSON: You got - it says "in progress," what's that mean?

VINCE VASQUEZ: Under Avra Valley Well- - or it's - yeah.

STEVE DEAN: This here follows some of our monitoring realms, nitrogen and hardness and fluoride. We probably hadn't got back those samples yet from the last quarterly monitoring realm.

Here's a slide of the distribution system itself and what we will reflect is the average, the lower limit, the upper limit and the number of samples of these particular constituents that feed that particular water system area.

Current Challenges. You may remember the Decision H2O Program that Tucson Water began a year or two ago. We actually had kiosks set up at the respective malls and what we did at that time is we had people test - or taste the 450 TDS blend and then the 650 TDS blend. And what we're currently underway on doing is doing an economic analysis and a sustainability evaluation that we'll be providing in the future to Mayor and Council.

Perchlorate. Back in the late '90s, early 2000s, water purveyors in California started seeing detects of Perchlorate, actually 350 sites they had detections. The public health goal in California is four parts per billion. Out of those 350 sites, 26 of those sites had levels of up to 40 parts per billion.

Tucson Water did detect Perchlorate in the Colorado River canal - or, excuse me - the CAP canal at the raw water turnout to our recovery basins back in 2004 at the detection level, and since then extensive quarterly testing, which we continue to do. We have not seen any detects of Perchlorate in our recovered Clearwater supply.

Tucson Water has a multiple barrier approach. We monitor and sample for 15 secondary contaminants and 25 unregulated; again, this is more stringent than ADQ and EPA expects us to do. We maintain Chlorine target level of 0.8 to 1.2 parts per million in the system. And we continue to have our management practice in place to prevent any new developing contamination situations in our system.

I'd like to go ahead and turn it over to Jeff Prevatt from Pima County.
Thank you.

JEFF PREVATT: Let me wrestle with this now, too. Unfortunately, Ralph left and I was hoping to use his pointer for some of these slides, but he took his finger with him.

My slides are going to talk about water quality and, with regulatory compliance, our main task is to ensure the protection of public health and the health of the environment.

Pima County Wastewater, we have 11 facilities

scattered. Tucson's kind of a scattered basin. We have Oro Valley, Marana, Green Valley. We have facilities that service all those areas, 11 in total. The larger ones are, obviously, in the metropolitan area and the smaller ones are scattered throughout the region.

This history here kind of lists the progression of -of wastewater in the Tucson Basin. Roger Road began in the '50s and slowly progressed; it says here expanded to 24 MGD in 1960. Roger Road, six expansions over the last 60 years. And, for the most part through the '50s and '60s, the real impetus was on primary treatment, primary sedimentation and also disinfection; that really controlled disease outbreak and waterborne illnesses.

In the '70s, the creation of the Clean Water Act, that really came about in good time because many - many of you may recall the rivers that caught fire in Ohio; that was - that wasn't - that was right around that time period. And so the regulatory impetus changed to - to try to look at - less the waterborne illnesses, but more at the manmade pesticides, herbicides, all the contaminants from industrial activities that were occurring throughout the '50s and '60s that were contaminating our lakes and streams, and so that's really where the regulatory push occurred in the '70s. We got the Clean Water Act. We got the National Pollution Discharge Elimination System Permits.

Pima County, we built the Roger - the Ina Road facility in 1977. In '79 we would take over all wastewater activities for the region here. In the '80s, the regulatory impetus shifted to really focus on source control; that would be the industries that actually discharge to collection systems. We responded by creating our Industrial Waste Control Program, our pretreatment program. They monitor all the industries and - and food service industries and commercial industries that deposit to a collection system.

There was also push towards what do you do with the residuals, biosolids? At the time, most places were landfilling their biosolids; they were lime treating it and taking it to landfills; it was odoriferous and it takes up landfill space.

And so in '87, Pima County built what we call the "RBMF," the Regional Biosolids Management Facility. All biosolids from Ina Road and Roger Road are processed at this facility; they're centrifuged to remove water so we're not paying for disposal of water weight; it all goes to beneficial use on agricultural lands in the Marana area.

This slide here kinda shows the - the black box of what a treatment plant is. All of them - the first two steps under "Physical, Primary Clarification and Screening," every treatment plant has those two characteristics. What the difference is in most treatment plants are the biological processing.

Here in Pima County we have our Randolph Park facility; that's a membrane filtration. We have activated sludge facilities. We have bio-towers at Roger Road. Roger Road is one of two only remaining facilities in the U.S. that still have trickling filters. And then we have the physical separation - that's secondary clarification - most every facility has that. And then the disinfection. Some facilities will then add to their disinfection, they'll add filtration to get some tertiary treatment as well.

The residuals that come out, we have effluent we - we use for recharge, reuse or discharge to the river; and then the solids, those are the biosolids. Part of the digestion process for biosolids we produce methane. At the Ina Road facility and the Roger Road facility, we extract the methane from the digestion process and they run generators, so we're self-sufficient on power. Ina Road, up until 2006, was completely self-generated on power. When we expanded the facility - now we had to supplement with TEP - but there's plans in the future to be self-sustained at Ina Road with digestion in the future as well.

These are photos of our different treatment facilities and they kinda show the different aspects. In the '90s, ADQ implemented a program called "BADCAT," Best Available Demonstrated Controlled Technologies. And everybody's familiar with the different classifications for effluent, the ABB classification, A, B, C

and the pluses. All of our facilities constructed since 1993 produced denitrified effluent of that class. Randolph Park, that's the membrane filtration. Green Valley's an oxidation ditch. Corona de Tucson came online two years ago and that's a small footprint BNROD, we call it a closed-loop reactor because they use - it's a closed-loop circular; they - it uses the common inner wall; it's a much more cost-effective construction technique.

This slide, this shows the number of tests that we perform to demonstrate water quality. Annually we perform over 60,000 tests in total at our different treatment facilities. And the pie chart on the left shows how those are broken down for each facility. Obviously, the larger facilities are more regulated; they have - because our permits are based on mass loading, how many pounds of contaminants that are discharged, so the larger facilities do more analysis than the smaller facilities, obviously.

And the slide on the right, this shows the number of analyses we perform a year; how much are for regulatory purposes and how much are for process control and improvement. So only 33% of the analyses we do are for actual reporting requirements that are mandated by the state and federal agencies; 67% of our analyses are done for process improvement; to ensure that we're protecting the public health and the environment; and of those, only .01% we have an actual

exceedance or a failure, we failed our regulatory limit. I think last year we had a total of seven; most of those were chlorine exceedances. We didn't de-chlorinate enough what we discharged, and I think in three instances we - we missed our disinfection requirements for the day and had an E-coli number above the minimum detection. And this is one of the reasons we do it: To keep my boss out of jail. When we do get an exceedance, there's a potential for \$27,500 per-day violation and imprisonment for six years and I - I don't want to be Mike's roommate and so I ensure that he's out of jail and myself as well.

This slide here shows the performance that we've had. What - what NACWA does is each year they issue awards for facilities that have surface water discharge permits, NPDES permits or AZPDES permits, and we have a great track record for - for receiving these awards. And what they do is any year that you have five exceedances or fewer at a treatment facility, you get a silver; if you had no exceedances in a calendar year, you get a gold; and this year was the first year that we've actually got platinum awards; platinum awards are issued to facilities that have received gold awards in five consecutive years, and so this - this was a first for us. We sent Frank Gall (ph.) and one of his operators up to Wisconsin and they received those awards. But that's our goal each year is to get a gold award.

At our larger facilities it's tougher because they're aging facilities and

we're - they're always in constant upgrades and repairs and so they're tougher to make at the larger facilities, but our smaller facilities it's become almost routine that we get gold awards annually.

Our preventive programs we have in place to ensure water quality. We have our IWC program and they regulate and do surveillance for what's being deposited to our collection system. We have our laboratory. We have the biosolids facility. Biosolids facility, you think how does that protect water quality? But, if you think about biosolids, we - we land apply it to agricultural crops, not as a means of disposal like a landfill, but it has - it's a high-organic content, so it has nutritional values. If you contrast it with fertilizers, high-ammonia-based fertilizers, it's an inorganic form and so if you - if you over-fertilize or you over-irrigate, it travels straight to groundwater, so you get nitrification to groundwater. Biosolids are very slow-releasing of that nitrogen; they have a high nitrogen content, but they also contain other nutrients: phosphorus, potassium and micro-nutrients, and they release that slowly, because as the organic matrix is degraded - so it's better for the crops, you don't get this initial burst of fertilizer; it releases it slowly over time, and they - and they hold moisture content very well and so it reduces the amount of water required for irrigation purposes, so it is a water quality benefit.

And then we have our Household Hazardous Waste Program and

that's done in conjunction with the City of Tucson to keep materials out of the landfill which can leach and damage our groundwater and also keep it out of the sewers.

We both have extensive Stormwater Pollution Prevention Programs and we participate in various research projects, the Arid West Water Quality Research Project. We participate in many EPA and research projects in USGS as well.

And new programs, this is a program that we just started this - probably in about - in 2009. There's been a big push - everybody's seen probably the AP articles that came out last year talking about pharmaceuticals in groundwater supplies and in our streams that, you know, wastewater treatment plants don't treat all these materials completely and so there - there are pharmaceuticals that get into your drinking water.

What we've done here in Pima County is we've started a local stakeholder group and it has members from the City of Tucson, Marana, Oro Valley, Arizona Pharmacy Alliance, Green Valley; it's - it's represented by about 20 member organizations right now, and their goal is to really keep these pharmaceuticals out of the wastewater stream. If we can kind of condition people that it's not acceptable practice to flush them, then we can keep 'em out of the - out of the sewers and out of our groundwater supplies. These are some of the groups that are involved in our

stakeholder process. We have another meeting next week. And, Mark, you're welcome to join if you'd like, we can get Metro in there as well.

And then the Regional Optimization Master Plan. This is our big project right now to upgrade Ina Road. Like I mentioned before, since '93 all of our smaller facilities now meet that standard. The only two remaining facilities that don't are Ina and Roger and it's - it's just an economy of scale. Small plants, small dollars; big plants, big dollars. The ROMP is a huge project, but this is going to really be state-of-the-art; a five-stage Bardenpho process; it's being designed to denitrify, enhanced disinfection and also to do phosphorous removal; and, because it's an activated sludge process, it will really help remove a lot of these emerging contaminants from the wastewater stream as well. And that's it, refer it to Jim Dubois and we have a little bit of time left.

JIM DUBOIS: Is that going to stay up? Okay. Before I get started here - yeah, I'm Jim Dubois, the Hydrologist with Pima County Wastewater - and, before I get started, anybody who has any water left in their plastic bottle, finish it up because you're not going to want to drink it after I get done. No . . .

Emerging contaminants are - it's - it's a challenging topic to take on because the breadth of substances that are - that are involved, that are being added to the list of substances concerned are - is growing all the time. The research is - is

cutting-edge, pioneering work. There are data gaps, snapshots of data here and there, but really not enough substance to work with, and the regulatory framework is - is in flux; it's changing. So I'll try to cover this as best I can.

Emerging contaminants include a lot of things we're familiar with: human drugs, various pharmaceuticals, different steroid compounds, there are substances that are in detergents, plasticizers, various fumigants, fragrances. I was surprised - I was reading today about how some certain musk scents are toxic to aquatic wildlife, insect repellants like DEET and - and even, you know, extend to natural substances that are out there, the phytoestrogens and things that are - that are excreted by wildlife in the natural environment are part of the emerging contaminant scene.

Other contaminants that we don't usually think of as emerging but they are, we're getting tougher standards or new standards for a lot of trace metals - and Perchlorate was mentioned earlier - arsenic and uranium's not listed here, but those - those standards are being tightened as we find new data about their - their health impacts.

So this slide shows you just a little bit about sources for emerging contaminants and you can tell that there's a multitude of sources that your - your residence where - as - as Jeff talked about - pharmaceuticals being discharged

down the drain or otherwise disposed of. Various - there are pesticides used in yards, stormwater runoff, pets and animals outdoors, various landfill operations or just trash and debris can be a source of plasticized - plasticizer compounds and - and there's - there's no end to where these things can be coming from because they're products - coming from products that are out there and used by us in the environment, so they get in - into wastewater, too.

Why are these emerging contaminants just now emerging? Part of the - the picture here is that laboratory - the past decade, laboratory capabilities have - have improved incredibly in terms of detecting these compounds. But, you know, what we - what we also see is they haven't been refined in terms of quantification of the - the compounds. There's a high cost of analysis so people are - are not prone to run complete tests on things or - or you just get a little bit of data here and there. It's easier to test drinking water because it's a clean matrix compared to soil and sediment and wastewater and - and so you have matrix effects that - that affect this sophisticated detection methodology, and EPA has not issued standardized methods for all of these - these techniques. They have put out some - some guidance about these things, but there - there's no regulation so that labs aren't licensed appropriately for these analyses.

Another reason that emerging contaminants burst on the scene

recently is that scientists have been out there applying these laboratory methods in the field and, you know, there have been these reports on what they're finding out - out there and they - they hit the news and they make pretty big news.

This USGS study that was done back in 1999/2000, the sampling took place and I believe it was released in 2001, made - it looked at the occurrence of these compounds in 139 streams across the country and - and it was surprising what they were finding in these - at these various - various streams. They targeted streams that had organic wastewater sources. They looked at four sites in Arizona; one was in Nogales at the Nogales treatment plant; one was at Ina Road; one was the 91st Avenue treatment plant in Phoenix; and one sampling point was at Gillespie Dam.

What they found in the nationwide survey, as indicated on this chart, showing the frequency of detection of these emerging contaminants. The - on the left is the most frequently - this has been - been condensed from the USGS report - but on the left shows the most frequent occurrence of - of contaminants, and you can see chlorinated fire retardants are - were found in almost 75% of the streams that were sampled, fecal and plant steroids were found in nearly 60% of the samples, prescription drugs were pretty high. Next on the list, flavors and fragrances and household wastewater compounds. So these things are out there

and they're being - they're being detected; they're being detected at very low levels, though.

So what are the - what are the emerging contaminant concerns? Of course, public health; it's always top - top priority; but also ecosystem risk may be more of a concern because a lot of these compounds are present at the nanogram-per-liter level; and at those - those levels, they may not be at a dose that's going to affect human health, but they may be at doses that are affecting aquatic wildlife, and it may be more of a driver for regulation, the impact on aquatic wildlife.

The substances among emerging contaminants that are most active at this low concentration level are the endocrine disruptors and so I have a little bit about what those are. Endocrine disrupting compounds are a subset of emerging contaminants, and you can see that they - a lot of those different types of contaminants fall in the - among - among endocrine disrupting compounds or suspected endocrine disrupting compounds.

JOHN CARLSON: What's that phrase mean, "endocrine?"

JIM DUBOIS: Well, endocrine disrupting compound is something that affects the hormonal activity in - in either the human body or in - in a target organism of some kind. And shown up here on - on the screen you can see the different endocrine glands in the human body, and substances can affect the production of

hormones by those endocrine glands or they can plug into at the cellular level - over - over here on the left I show kind of a diagram of how the cell has a receptor site for these chemicals for hormones, and some of these chemicals can plug in and either act in - instead of the hormone or block the hormone from acting. They can - they can trigger a more - a greater effect than the hormone might've triggered in the cell or a lesser effect. So this is how they - they react. And you can see that aquatic organisms that spend their life in the water are exposed to these substances in - in greater quantities and can absorb them through their skins and be affected by these things.

So how do endocrine disruptors behave in the treatment process?

Well, conventional wastewater treatment is generally efficient at removing chemicals responsible for estrogenic activity, but some potentially important trace organics are not effectively removed.

This chart just shows some - some compounds that are removed through the conventional wastewater treatment plant; that would be the first treatment set up that Jeff talked about in his - in his slide program, not the advanced treatment process. So you're getting, you know, 80 to 90% removal for a lot of compounds, but - but many still persist.

One thing that's pointed out in our paper is that source control

measures, or even chemical product prohibitions will probably not greatly reduce estrogenic activity in particular in wastewater because most estrogens result from natural human hormone excretions. You've got so much out there that is coming from the general population, that reducing the drug impact will - will - it'll have an effect, but it won't have a significant great reduction effect.

So one study in - in 2004, Black & Veatch looked at some wastewater treatment plants in Arizona and found that there was - found these removals for the various treatment plants - this was before Roger Road was converted to an activated-sludge plant, and so you see that very low removal for - for - 33% removal for endocrine disrupting compounds. Some of - the significant thing on here is that four of those plants, Avra Valley, Randolph Park, the two plants in Flagstaff, are denitrifying plants, and denitrification, it turns out, is very effective at biodegrading a lot of these compounds and they will - the treatment process either looks to those - the biologic process of treatment either looks to those compounds as carbon source or as oxygen donors; somehow they're breaking down in - in the process.

There's a lot of research yet to do on how these compounds behave in the environment, and I put in a picture here from USGS's website showing, you know, they're doing some studies here finding that some of the compounds that they

recognized were out there in the stream environment, now they're sampling downstream and finding effective degradation within stream sediments, and - and so these - these studies need to be done in terms of the fate of these compounds in the environment and there's - there's more to the story yet to be written here.

The regulatory status of - of emerging contaminants. Only four of the emerging contaminants are on the EPA's contaminant candidate list and - and this is the list that they'll consider for standards. So the report indicates that, you know, it's going to be a while before standards are developed for these compounds and - because it just takes EPA time to work through the process and because a lot of data is - is not available yet to make those decisions.

EPA is also developing guidelines to evaluate reproductive and other hormonal effects in aquatic life and this is - this requires - they just put out some guidance this year about how to look at the effect of substances that are not toxic, not acutely toxic or chronically toxic to animals, but that have some sort of reproductive impact on - on these animals or hormonal effect on - on their development, so that's - that's something new that's happening.

In the absence of established standards, our report indicates that general preventive measures can be effective; looking at pretreatment and industrial source control to reduce emerging contaminants in the wastewater collection

system; using the multiple-barrier approach to assure the drinking water system has integrity; and doing some public outreach and education of the public about safe disposal methods of some of these compounds. Thank you.

ED CURLEY: Jim, more - about five minutes long - on what we wanted to get back to, so we'll just briefly skim through the recommendations.

Basically, the point's been made that the ROMP program brings (inaudible) to the major metropolitan facilities and that will be the single most effective step because you get up to 99% removal like you have at Avra Valley.

The source control programs, industrial wastewater, pharmaceutical take-backs, like Jeff's talks about, increased use of the hazardous waste program, looking at national research and regulatory activities. We're very involved, both Tucson Water and ourself in this, and we got some good collaborations with Dr. Arnold and other folks at the U of A, the public outreach and education, like this workshop tonight. Also, there are formal programs that we're doing and trying to get federal funding for all of those activities because we anticipate federal regulation, so we'd like to get a little funding to help us get there. Thank you, and if there's any questions we can also take questions at our website.

CHAIRMAN JIM BARRY: I'm going to take one question. It's - it's five to 9:00, I'm going to take one question and we're going to go Call to the Audience

and then we're going to be done. And, Marcelino, did you have your hand up?

JOHN CARLSON: I did.

CHAIRMAN JIM BARRY: All right. You're the one question.

JOHN CARLSON: On page seven and eight you got TARP that - out there, different colors and it talks about the thing that you had at the end, 4-Dioxane. Can you tell us where we're at out there and what's happening and what they expect to happen and are they getting people dying still or what's going on?

STEVE DEAN: Yeah, again, the 1,4-Dioxane is an emerging contaminant. The EPA has not established an MCL on it, but they have established a health advisory level of three parts per billion. The only way that you can remove 1,4- Dioxane from the aquifer is advance oxidation which would be UV peroxide or ozone peroxide. So what we continue to do right now is we still continue to manage and mitigate 1,4- Dioxane into our distribution system by blending sources. So right now we're still maintaining levels of two parts per billion or less.

Now on the horizon, again, the health advisory is three parts per billion. We're not sure where the MCL, if any, in the future will land. The minimum detection level for 1,4-Dioxane right now is one part per billion.

JOHN CARLSON: My point is: Is the problem getting bigger out there or are you whipping it or how long do you expect . . . ?

STEVE DEAN: The plume - the 1,4-Dioxane plume is relative to the TCE plume. 1,4-Dioxane is actually a sister constituent of TCA, not necessarily TCE; it was used as a stabilizer once they discontinued the use of TCE in the late '80s. So the TARP treatment plant itself is for TCE only and it's for plume capture and plume migration; it is not for aquifer restoration. So what we're doing is continuing to - to continue to mitigate the best we can and we pump seven million gallons a day through the treatment plant.

JOHN CARLSON: Do you expect to be doing that for the rest of your . . . ?

CHAIRMAN JIM BARRY: John, one question, not three.

JOHN CARLSON: Well, he didn't answer it.

CHAIRMAN JIM BARRY: Well . . .

UNIDENTIFIED MALE SPEAKER: One question, three parts.

CHAIRMAN JIM BARRY: Jeff, Steve and Jim, thank you very much.
That was very helpful.

(Applause.)

CHAIRMAN JIM BARRY: Number 11 is the Agenda for next meeting.
Just quickly, it's going to be Staff report and the beginning of our facilitated discussion.

City/County Water & Wastewater Study Oversight Committee
_Committee Meeting Held on September 17, 2009 - Phase 2

Call to the Audience.

(No response.)

CHAIRMAN JIM BARRY: What? I move for adjournment. Done.

Thank you very much. This is a milestone. This is the last presentation that we have.

(Applause.)

CHAIRMAN JIM BARRY: We're in the home stretch.

(Conclusion of meeting.)

* * * * *

CERTIFICATE

I hereby certify that, to the best of my ability, the foregoing is a true and accurate transcription of the audio recording of the City/County Water & Wastewater Study Oversight Committee Meeting held on September 17, 2009.

Transcription completed: October 13, 2009.

DANIELLE L. KRASSOW