

Transcript of May 21, 2009 Meeting
City/ County Water and Wastewater Oversight Committee

CHAIRMAN MARCELINO FLORES: Good evening. (Not speaking English; unable to transcribe.)

Did Jim not tell you I get to conduct the meeting in Yaqui? No?

Welcome everyone. Thank you for being here. We have a quorum, and with that we're calling the meeting to order.

The approval of the minutes, as they did not get out, is going to be tabled and, hopefully, we'll get to chance to review them well beforehand before the next meeting, so.. .

So, moving from Call to the Audience and the meeting minutes being tabled - well, let's do the Call to the Audience. I don't - do we get cards or . . . I don't know if we had any cards Nicole? No?

NICOLE EWING-GAVIN: No, we haven't (inaudible).

CHAIRMAN MARCELINO FLORES: Okay.

NICOLE EWING-GAVIN: We can just ask if someone wants to speak.

CHAIRMAN MARCELINO FLORES: Are there - anyone willing to speak at the Call to the Audience?

(No response.)

CHAIRMAN MARCELINO FLORES: Hearing none. At the last meeting we had left with the water costs Val had presented and she was invited back to - to answer any questions. At this point, I don't know if the Committee has any questions or responses, comments. We were kinda not so sure how - how we might bring her up to field questions with the City/County; if that's something that the Committee's willing to entertain? Okay. Well, Val do you have any other comments or suggestions? Okay.

Well, then we'll be on Item 4, Nicole, the followup on the papers.

NICOLE EWING-GAVIN: Thank you, Marcelino. So, you should have handed out to you - and there's some extra copies at the table - a paper that says "Reclaimed Water, Technical Paper Followup" at the top, and stapled to it says, "Drought Planning, Technical Paper Followup."

So, this was sort of the format we used, and we're open to suggested changes to it, but we want to keep track of kinda key points and follow-up items that are coming out of each of the discussions of these papers. So, you know, go ahead and take a look at this and then, before next meeting - if you have any changes or additions, we can make those - but we'll start doing these for each of the papers to keep track of areas where you wanted more information or also to track sort of key themes, comments and recommendations that the Committee or the public made during the meetings.

And the idea that these would - the - the technical papers that we're posting online are sort of done at that point, and this information that we're - we'll be collecting and tracking will help write sort of the final Phase 2 report that would come from the Committee in the fall, we'll say. Any comments or questions about that? Otherwise, we could talk about it more at the next meeting.

CHAIRMAN MARCELINO FLORES: Okay. Well, if there are no questions and - we'll keep the meeting going. Melaney 's going to introduce the City and County Water Conservation Technical Paper.

I guess one more thing is I think the last time we'd talked about the presentations being limited in terms of their dedication to time, so I think that's still the same goal or intent for this meeting, if I'm not mistaken. We'll have a brief presentation and we'll be able to interact with the Staff.

MELANEY SEACAT: Mr. Chair, members of the Committee and members of the audience, good evening. I - I will adhere to the request that we keep the presentations brief so that we can allow more time for Committee and audience interaction. But, I want to say that this paper in particular was extremely complex because there are so many players in the area of water conservation within the City and County, and I think because of the scope questions we - we really struggled initially with getting the focus right for this paper.

Really, this paper - the scope questions asked us: How can the City and County implement consistent water conservation standards and ordinances to help sustain long-term water

supplies? That was one of the scope questions. The other was: How can the City and County work together to ensure that water conservation protects future water supply, not simply makes more population growth possible?

And so when we started out, you know, this could've been a 30-page paper entirely devoted to Tucson Water's Conservation Programs; the status of their programs; it's an area that everybody's interested in; this Committee's interested in it; and truly it's an excellent story to tell because Tucson Water has been a leader locally, internationally and nationally in water conservation and deserves recognition for establishing and maintaining the - the strong water conservation ethic we have in this community, and in achieving a really dramatic per-capita water use reductions. I personally would've been very happy, as a former Tucson Water, Water Conservation Specialist, to see that story told; but, alas, we could not just focus this paper on that.

So, what you have before you is a paper that does have a story, a very truncated story, about Tucson Water's conservation efforts, but it largely focuses on the question of: How do we have more consistency with our regulations and our ordinances? And, also, how do we look at this complex question of why do we need to conserve and how do we ensure that water conservation is not just for growth, but protects our future water supply?

So, I took the liberty of putting together these slides - not that I'm presenting them to you - but just to kind of key in on a few of the key - key messages in this paper, because it is long and quite complex.

So, in looking at the question of consistency and how do we, within the planning realm, how do we - what - what's the water conservation component? We started out by looking at the key drivers. And, here again, I think whether you're a planning agency or a sustainability office or utility, when you're looking at water conservation there's a shared ethic for stewardship that's common; it's a driver for everything everybody does in the realm of water conservation. But, also, when you look at the utility, Tucson Water has some unique drivers, and so that's something that we took into consideration; that Tucson Water has to mandate - I mean, has to balance the regulatory mandates for per-capita water use according to ADWR requirements with a predictable revenue stream to maintain

utility operations. And, because of that, they do an extensive and rigorous analysis of their water conservation programs; they did that with a Community Conservation Task Force, and some of that was presented to you in Phase 1, some of the factors that they consider; that has led them to prioritizing technology-driven measures, to provide a good cost benefit to the utility.

And so their efforts are largely focused on changing customer behavior - behaviors, reducing water demand in the built environment, and their primary tools are education and incentives, such as water price signals, leak detection and extending reclaimed - or maximizing the extension of reclaimed water lines. Those are unique tools; they're primarily the tools of the utility; and, as such, there's not a lot of overlap. Where the overlap occurs is with respect to new construction and we'll be going into that in a - in a minute. But this is just a list - this next slide is a list of the drivers.

The third slide talks about the three approaches to water conservation that this paper goes into in some depth. So, again, I mentioned that Tucson Water is focused on changing water use behaviors in - in the existing customer base, and they use education and price signals largely.

Also modifying existing construction. There are not a lot of opportunities within the regulatory environment to effect water conservation because of the grandfathered uses that are there. When you're going into remodeling and retrofitting, sure there's opportunities; and, again, Tucson Water, with their rebate programs, et cetera, is having a big effect in that regard.

But, the third approach has to do with building water conservation into new construction and looking at efficiency measures that can be gained through land use regulations and through construction standards; and this is really the frontier for increased consistency between the City and County, and it's also a significant area for future water conservation potential.

And I want to take a moment here to introduce the other people on the panel. To my right is Suzanne Shields, she's the Director of the Regional Flood Control District. She was an integral contributor to the paper. To my left is Sandy Elder with Tucson Water. I think you remember him from Phase 1. Fernando Molina is the Public Information Officer for the Tucson Water Conservation Office; he spent his entire career I think -

FERNANDO MOLINA: Interim.

MELANEY SEACAT: The interim, yes. We love that interim world; a lot of dynamics going on here. And Leslie Liberti is the Director of the City's Office of Sustainability and Conservation. Did I get that right?

LESLIE LIBERTI: Close enough.

MELANEY SEACAT: Okay. So - and Suzanne, it's interesting because the Flood Control District came in kinda late to the paper, but - well, they - they were there all along, but she became heavily involved because the more we got into this question of consistency, the more Flood Control and the authorities that are - and the opportunities that are there with respect to at, a subdivision scale, having the opportunity to integrate the City and County drainage standards and development standards to - to achieve increased efficiencies came to bear.

So, one of the main conclusions from our analysis was that to be effected, the City and County and the various departments within the two jurisdictions really need to get on the same page about goals and being clear about the goal will help define the preferred strategies for achieving water conservation at various scales of development, and that the pursuit of water use efficiency allows for quality of life tradeoffs to be factored in, and these quality of life issues really get to the question of: Why are we conserving? So water conservation that's geared strictly at reducing consumption can have negative impacts; and, although, you know, meeting GPCD's goals is important, water efficiency is really, really key to an integrated approach.

The next slide is a list of all the people that were involved, and I think this is another lesson learned from this is that water conservation needs to be a community-wide effort and that there's responsibility in many different places. And, historically, we've often looked to the utility to be - to be our arm in the community, and Tucson Water's done such an excellent job of that, but the reality is the role for water conservation is diverse and falls in many places, and there's increasing recognition that really water conservation is an integral part of an overall water management strategy, with efficiency measures being critical and that they need to be applied in various contexts, both the existing built environment and in new development, and that the approaches vary depending on where you're applying them.

So, to illustrate the point about all the players, this is just a list. You can see there's almost two dozen people that were involved in contributing to this paper and they came from the departments from Tucson Water, from the City of Tucson and Pima County Planning Departments, from the Sustainability Offices of both the jurisdictions and, also, from the Flood Control District.

The next slide talks - we did do some analysis - you know, we're asked to look at areas of consistency, and one of the reasons that we needed more time for this paper was to really talk about consistency we needed to do some analysis, and we barely scratched the surface, you - you know. We're going to need time to look through and really comb through the landscape codes and the various ordinances, water harvesting, gray water to see where, indeed, the greatest opportunities for consistency are.

But, in a nutshell, in our preliminary analysis, we did identify that there are some differences in authorities and mandates that do limit our ability to just *de facto* adopt exactly the same ordinances. For example, the County is not a charter government; the County - the City is a charter government which gives them more flexibility. We do not have that same flexibility. We are required to conform to State statutes in a lot of what we do; and that's actually significant and it's influenced, for example, we have taken an approach - particularly at the rezoning stage - where we call it a "performance-based approach," and the County now requires through its comp plan water resource element policies that, at the rezoning stage when a new development is coming - coming in, that there would be an integrated Water Resource Plan that documents how the water is going to be - what the water resource impacts are, where the water's going to come from and how it's going to be mitigated, and that drives water conservation.

So, these water conservation measures that the developer must come in with can be selected from a menu of options and that plan - those options and those measures that they select can then become conditions of rezoning.

So, we are, for example, water harvesting and gray water are part of that menu, and so in the subdivision scale of development the County is driving water harvesting scale kinds of things at that scale; as opposed to the great work that the City's done at the built environment scale with driving water

harvesting in new construction at - in a more urbanized environment, and that's an important tool that they've brought to bear and we want to evaluate that, but that is also a more proscriptive approach.

And one of the differences that we also have is with respect to enforcement and the County feels that, yes, proscriptive approaches have a place, but there's also a need to enforce and we also have limited ability to enforce. Our only ability to enforce is really through zoning enforcement. Somebody files a complaint and a Zoning Enforcement Officer goes out. So, some - those are some of the differences that we're grappling with, but there's also a great deal of similarity.

And so, for example, with the sustainability policies and goals, both the City and County sustainability policies recognize that building and best management practices and integrated water resource planning from the start in new developments is critical to maximizing water conservation outcomes. Both the City and County land use policies, the comp plan, the general plan strive to protect the environment and to conserve water and lower future water demands by reducing the water footprint in new construction through directing where and how development occurs.

City and County both have preconstruction tools available to require water conservation through drainage standards, development standards and new Building Code requirements and Zoning Code requirements. Similar to the ordinances, we also - the County is also somewhat restricted in that we have to conform to State statute with our standards, but we have a little more flexibility with our standards.

The Flood Control District also has a unique ability with its authority to regulate for floodplain management to then integrate water conservation measures and efficiency measures through their floodplain authority, and that really helps the County get around some of our limitations with regulations. In other words, they're now in the process of building in rainwater harvesting and drainage standards that will support landscape irrigation needs in the landscape in a water-efficient way, and where - where there's an opportunity is for the City and County to really work on common standards in that area.

Both jurisdictions have adopted standardized building and plumbing codes, both the International and Uniform Plumbing Codes contain provisions that mandate maximum water flows for typical residential and commercial plumbing features.

And, finally, Pima County has adopted a green building program and the City of Tucson is working on a very similar program, and both those programs encourage builders to be more aggressive in water conservation measures, and they get points for that.

You know, the landscaping codes, again, they're very, very similar; there are minor differences. Streamlining them to get rid of the minor differences is probably a good idea; it would make things easier; but, from a water conservation standpoint, they're similar in terms of the major ways in which we achieve water conservation in the landscape.

So, the opportunities for consistency - just to summarize going forward - are, number one, to reduce future water demand in new construction at the rezoning, development plan and building permit stages of development. And then in the rezoning and development stages to look at, you know, adopting a more consistent performance-based approach because that's where you have the opportunity to be innovative in the - in the things that you're doing, to be flexible and adaptable to emerging technologies, to tailor things to site-specific conditions.

And then in the permitting stages, to adopt common standards and evaluate the use of consistent ordinances, and the County wants to do that; to really take a look at what the City's doing with their water harvesting and gray water harvesting ordinances and evaluate the feasibility of adopting them.

And then for the existing built environment, we want to conduct joint education efforts to increase the consistency of water conservation messages.

This question of: How does water conservation protect future supplies? We grappled with this. We looked at it from a few different angles; the first one being that in answering this question, you know, we need to look at the broad concept of water resource planning as an integrated - water conservation in the context of integrated water resource planning, taking into account historical efforts to, quote, unquote, shore-up current conditions.

So, what that means is, you know, we have depleted aquifers through over-pumping in the past that's had negative impacts on environmental areas, and there's - there's a goal - both, you know, to - to shore that up; to help remove groundwater pumping in sensitive ecosystems, to protect riparian areas and to restore the environment. The Pima County Sonoran Desert Conservation Plan is a mechanism that's in place to do that. The conservation land systems is - is explicitly directing growth away from sensitive areas.

Similarly, the question of preserving options for the future, if you look at the Tucson Water 2050 Plan, that's another example of an integrated water resource plan that took a long view; that looked at the whole portfolio of water resources; came up with several different scenarios and - and is really talking about this question of carrying capacity. So, at what point do we have to get that next bucket of water? And the further we can push that back through water conservation, the better off anybody is; it allows for more flexibility, more cost-effective solutions to come into play, more options to - to be evaluated so that we can be more cost-effective and more successful as a community.

And then, thirdly, just this whole question of water use efficiency and quality of life. If we're strictly looking at water conservation as a reduction in water use in order to meet our gallons-per-capita-per-day requirements, you know, there's a lot of messages that get confused, you know. What are we going to do? Cut down all of our trees to make the GPCD? I don't think so.

So, when we talk about water use efficiency, it allows for a more complex view of it in which what - you know, public input becomes very important to understand the quality of life tradeoffs and to understand what the values are, and then through water efficiency being able to diversify the uses of water. And one of the mechanisms to make this more transparent to the public is finding ways to actually link conserved water and saved water with specific projects, and that's one of our recommendations which I'm about to go into.

So, the first recommendation is to establish common water efficiency goals, and there's a number of bullets on this slide, which I won't read them out loud but, you know, basically the idea is that we want to focus on water use efficiency; we want to see where we can get to a community-wide goal; and then at the different scales of development, the subdivision or neighborhood, the individual lot and, possibly, even at the subregional scale, develop strategies for each scale of development. And where this

can play out is that the identification of these goals can then become institutionalized or operationalized through the updates to the land use plans potentially. And stakeholder input is very important in this, so that's something that was discussed.

Recommendation number two is to improve the consistency in the standards. Again, we think there's - there's tremendous opportunity there for - for the City and County to come together on new construction at the building or individual lot scale; to implement common baseline standards for interior and exterior water use; that's also a lead model that we can look at them as a potential model for how to do that.

And then, when completed, we - the County should be evaluating integrating the City of Tucson's rainwater and gray water harvesting codes and standards as appropriate into our development code standards and guidelines. And, when completed, the City of Tucson can evaluate integrating Pima County's flexible performance-based approach to achieving water conservation at the subdivision and development plan stage. So kind of adopting a menu of options is the idea there.

The third recommendation is to develop joint education programs, building upon the existing education programs; for example, the Community Conservation Task Force and Tucson Water's great programs; to build a common vocabulary and develop these new programs.

And then the fourth recommendation is to enhance planning and evaluation. There's a tremendous amount of work that's already being done I think at Tucson Water and at the University of Arizona to evaluate trends; that is helpful and we need to do more of that, and we need to develop new and existing measurement and enhance our existing measurement and reporting system so that we can communicate successes and share data and information and be consistent in how we're evaluating the success of these programs.

And finally the final recommendation is linking water conservation to protecting future supplies, and this is - the Water Resources Research Center, Sharon Megdal and company, had developed a concept a while back - and I know Tucson Water's been working with them to - to evolve and adapt it in a way that's feasible - called "Conserve to Enhance." And, essentially, this idea is that you are linking conserved water to a specific environmental restoration project, possibly by earmarking it on the water

bill. Whether or not it's feasible to do it administratively via the water bill, I think is a question, but the idea is that we can work with that concept; it's a good concept, develop voluntary ways for customers to identify specific projects that they would like saved water to go towards. So, whether it's aquifer augmentation or expanding green spaces, more ballparks and parks, or allocating water to sustain and restore riparian habitats, it's an enormously popular idea.

And then the second idea in terms of linking water conservation to future supplies is to develop a voluntary green building standard that incentivizes energy and water resource efficiency practices at the building scale in both the City and County.

So I thank you for giving me a little bit more time to break down this complex paper, but hopefully it set the stage for a better dialogue. And I'll open it up to questions.

CHAIRMAN MARCELINO FLORES: Before we get into the questions, I wanted to welcome Vince and Bonnie. Just to let you know that we tabled the meeting minutes, so you didn't miss the minutes. There are no minutes available. And Val Little is available I think if we're going to make comments or questions regarding the conservation paper submitted by Water CASA. That - questions on the City/County conservation? John?

JOHN CARLSON: What is an efficiency standard? What is it, an efficiency standard?

MELANEY SEACAT: What is an efficiency standard?

JOHN CARLSON: Yeah, you got it in your recommendations here.

MELANEY SEACAT: As a recommendation?

JOHN CARLSON: Or efficiency goal I should say.

MELANEY SEACAT: Well, one - one idea is that at a community-wide scale you could have something like a common gallons-per-capita-per-day goal; that's something that's easily understood and quantifiable, and every jurisdiction - or every water provider I should say is mandated by ADWR to have a GPCD goal. The problem with that is that, number one, we are already mandated to do that; number two, if you just look at the gallons-per-capita-per-day goal, you don't necessarily get at the larger issues that I think the public's asking about why are we conserving.

So, that - the water efficiency - efficiency is a ratio, obviously, it's the amount of water per particular outcome, and so with an efficiency goal you're going to be getting at a broader scale. Did you want to say . . .

NICOLE EWING-GAVIN: I would just say that water efficiency's another way to think about water conservation, so we're using the term "water efficiency," but it's water conservation just kinda connotes lowering water use, but water efficiency is - looks at it in a broader way, saying - making sure you're making the best use of your water. So, when we say "water efficiency," it's kind of another way of saying conservation.

JOHN CARLSON: Are you going to have actually ratios of figures for different types of situations or - or what, you know?

MELANEY SEACAT: Yeah. Well, we haven't - we haven't met to discuss it, but I'm going to turn it over to Leslie Liberti and - and let her discuss that, if she has any - if you'd like to comment or Fernando? Fernando, yeah.

FERNANDO MOLINA: Okay. One of the things that I've been trying to - the other hat that I have worn for many years at Tucson Water and still do is the Conservation Program Manager - and so one of the things that I've been trying to do over the years is try to get people to think more in terms of efficiency, as opposed to conservation; because, in my experience as I got out into the community and I talk to people about conservation and ask 'em what - what they feel that means to them, generally they'll say, "Well, it means using less water," and I don't know that that's always the goal. I mean, we often will get reduced water use when we become more efficient in our applications of how we're using it.

I'll give an example - excuse me - of - maybe some people will understand a little bit better what I'm talking about, and this goes to some work that we did early, early on in the mid-1990s examining irrigation systems and, specifically, we're looking at turf irrigation. And we were mandated by the State of Arizona at that time to start looking at evapo-transpiration-based irrigation; that basically means you're watering the plants based on what the plant water requirement is, not what the guy who turns the - adjusts the timer thinks the plants needs.

We found out from actual field studies as we measured the operating efficiency of these irrigation systems, we found out that they weren't in really good shape. The - the unit of measurement is distribution uniformity. So, if you have a sprinkler systems, you want to make sure that that - the sprinkler's distributing the water as efficiently as possible, and the way you measure that - maybe some of you are familiar with this concept of putting tuna fish cans or something out there - you can put some sort of device to measure the amount of water that's being sprinkled out there. And, theoretically, you should have a fairly uniform amount in each can or each measuring device that you have out there.

Well, what we found out is most of the irrigation systems in the ground today in Tucson - and this is - we did these studies in the mid-'90s, and I can ensure you if we went out and look at systems today we'd probably see the same level of performance - the - the unit of measurement is distribution uniformity. What we saw were irrigation systems that operate at about - I'm going to say 30% distribution uniformity.

Essentially, kind of the real rough rule of thumb of looking at that is: If you're operating at 30%, you're probably going to have to over-irrigate by 50%, 60%, to keep the grass looking uniformly green. What that means is: You have some areas of grass that are getting a lot more water than the other. What you see is runoff.

One of the experiments that we did was improving the irrigation efficiency of irrigation systems and seeing what happened with water use, because one of the things that we discovered early on was if you try to connect irrigation with evapo-transpiration, you can do that and you can adjust the irrigation scheduled based on the inefficiency of the system, but that's where you get the over-irrigation.

We worked with TUSD on this project. We had some schools where they increased the operating efficiency of those irrigation systems and, you know, one of the things that we saw was the change in water use wasn't that great, because they tend to deficit-irrigate or under-irrigate for budget reasons at most school grounds.

But, one of the things that we saw - and this is where the efficiency comes in - one of the things that we saw is while the change in water use may not have been that drastic, in some cases it actually went up a little bit, most of the time it stayed about the same or was reduced a little bit - but one

of the things that we saw was a really improved quality of the turf; it looked green. I don't know if you ever fly over Tucson and you look - fly over the school yards, you see green rings, brown rings, big brown spots, what we saw was a more uniform, better quality turf and that was without using much more water, things improved. To me, that's an example of efficiency improvements.

And so as we look at - in the area of landscaping, to continue along there - for efficiency purposes, I'm - I'm - I think we've got it covered pretty good in terms of the plant materials that I use, but one of the things that concerns me is the delivery system, irrigation system, is not always operating as efficiently as possible, and that's one of the things that we'll be looking at the future is making irrigation systems more efficient, whether it's a drip system or a spray system.

LESLIE LIBERTI: And I - I would -

FERNANDO MOLINA: I don't know if that kind of explains that concept of efficiency. The grass - the grass looked a lot better with the same amount of water.

LESLIE LIBERTI: And I think in our - in our statement here on the recommendations what we're trying to do is paint a picture that we think that it would be helpful to have a shared goal community-wide that would help on a number of levels. If you have some kind of a measurable goal and you are all working towards it, then you can see whether or not - it's like an indicator of success. Are we making progress? GPCD is it right now, but everybody has their own GPCD and, from a public perspective, that doesn't really help the public understand. Are we doing - you know, how are we doing relative to water conservation.

It also helps because the strategies then could be matched better, but the strategies really have to be tailored to the goals at different scales of development, so we also are talking about efficiency at, for example, the neighborhood scale. And I just want to be honest and say: I don't know what an efficiency measure at a community-wide scale - that's why I'm personally thinking GPCD is really our best bet for a community-wide goal, but there are problems with that. So, we - that's why we say we're going to evaluate that. But, I think at the neighborhood there's definitely some examples and I'm going to turn it to Suzanne.

SUZANNE SHIELDS: As Melaney said, this report looked at both utility conservation and their efficiency could be measured in terms of leaks in your pipes and things like that. But, we also are looking at land use efficiency, especially for future land use and future development.

There's a quality of life issue for all of us. We know we need to provide recreation. We know people like to have swimming pools. We know - we know there's a certain quality of life that they want to have. But, the question we have as we're looking at how we develop in the future, there's probably more efficient ways to lay out your neighborhood where you have community pools. Recreation, maybe we need more regional recreation facilities, as opposed to everybody having a certain amount of grass in their backyard. So, there's certain efficiencies to how do we conserve water and keep our quality of life? Do we collect every raindrop that falls and then, as a result, our riparian habitat disappears? That's probably not the most efficient use. But, we certainly could do things that encourage water harvesting, which helps with conservation.

I think some of us are looking at it from a land use perspective and saying, "How we lay out a community affects how much water you're going to use," and keeping natural open spaces, clustering lots, doing things like that has a real value in reducing the amount of water per residential unit.

CHAIRMAN MARCELINO FLORES: John, I wanted to ask a question -

JOHN CARLSON: Go ahead.

CHAIRMAN MARCELINO FLORES: - similar to yours about the - the efficiency and kinda get a response from Staff.

It's my understanding that each meter or each pipe has, basically, a capacity that, you know, if you leave it on all the time then that's 100% use, and you can come back and say, "Well, you know, you're using it this much, this percentage of the time and maybe you should set your goals lower." Is there kind of a given standard percentage based on - on the available water that - that's sustainable or liveable?

SANDY ELDER: I'm going to attack that from a hydraulic customer perspective. You know, we have - you're familiar with - we have low water use in the wintertime, and we have high water use in the summertime, except for today; but, the same holds on a daily basis, there's times of day when -

different times of day when you have different amounts of water that's being called for by that customer. Look at your own households and stuff and think about when you're using water in your house. So, if you adopted some sort of standard of taking the demand over the - the capacity into the thing, you would lose some of these diurnal effects, and think you'd be into some - I mean, we can look at it for sure, but I think we kinda get lost in some mathematics and - and not really get to the heart of what we're trying to do, which is bring down water that - water - overall water use. And I think by looking at things from a volumetric use over time, it's probably the best way as opposed to pipe capacity, 'cause, you know, when the whole neighborhood is calling for running their washing machine, they all want to be able to run that washing machine at the same time, you know, we don't want to restrict that need of the customer. Now, how many times that neighborhood runs that washing machine, that's a different matter. So . . .

CHAIRMAN MARCELINO FLORES: Yeah, I think Leslie you're going to add . . .

LESLIE LIBERTI: I was going to take it to the next scale up and - and why we're trying to talk about efficiency instead of something like GPCD, gallons per person per day. The difficulty with GPCD is that it's not just residential use, and - and it's - even with the residential side it's a little bit more complicated. So, a lot of the things that the City's starting to get into, like climate change planning, climate change adaptation, we're having to ask these larger questions about quality of life and quality of the economy in this community and use of renewable energy. So, by framing it in terms of water efficiency, you accept that in some areas we may actually want to put more water towards particular uses, and if we're just thinking about lowering per-capita use, it - you run into trouble with assuming that it's just going to continue to go down and down and down.

So, a few examples are, you know, there's a real need and an interest to move more into the use of renewable energy in this community. I mean, we have a lot of opportunities for solar power and, when you do it in a large scale, you're doing it through concentrated solar thermal and that requires some amount of water.

When we look about - look at the implications of climate change with less effective precipitation, higher temperatures, you are very likely going to see increased water use in residences as

people run swamp coolers longer, they irrigate more, and we want to be able to balance use of water, you know, using as - as little as we can with preserving quality of life in the community.

The other example is: We may want to have industry in this community that does use water, and that would - that would increase the overall GPCD, but is that necessarily bad if we're bringing, you know, high-wage jobs into the community?

So, the idea with water efficiency was to give us the flexibility to address all of those different aspects and not just think about it in terms of we just have to keep reducing and reducing. There's other goals from a sustainability perspective.

CHAIRMAN MARCELINO FLORES: Well, you got a pretty long answer to your question, John, on efficiency.

JOHN CARLSON: It only stimulated about 15 more questions.

CHAIRMAN MARCELINO FLORES: I know.

JOHN CARLSON: If you want a couple of 'em, I'd like to put 'em out there.

CHAIRMAN MARCELINO FLORES: Can we ask - Mark, do you have something along a similar topic?

MARK STRATTON: Yeah, I would like to say that I do agree completely, Leslie, with your comments on GPC not necessarily being a good goal to be established. I think there's a number of experts that have identified the GPC as giving a nice kind of benchmark scale, but it's not necessarily a number you want to use when you're looking at a conservation or efficiency-type program. As you pointed out, there are way too many variables that are in a GPCD that each individual water service provider has their unique stature of how they deal with that.

That being said, when you - when you look at this community, I think the Tucson community as a whole has done an outstanding job over the years with a conservative ethic; that being said, that next amount of conservation or efficiencies gets more expensive and doesn't produce as much as the previous programs do.

When you look at indoor water use, I think the plumbing codes have been a great help in getting the indoor water use to the levels that they are. There's very little room in there, except when

you're looking at resale of homes, making sure that those homes are retrofitted with more efficient appliances and - and fixtures; that - that's an issue I think that is community-wide that needs to be addressed.

But, I think the real key is quality of life with outdoor use because you have a value system where those in certain parts of the community are more affluent, they can afford to have much more lush vegetation around their - their areas, where you have other areas where there's no grass, just dirt and a couple plants that survive on whatever Mother Nature has.

So, there is a quality of life aspect, but as we have other issues such as continued drought, I think those quality of life issues cross paths with the need for some level of conservation related to that; to ensure that the - the domestic demand for indoor water use is still able to be met.

CHAIRMAN MARCELINO FLORES: Thank you, Mark. Your comments on - seem to be getting towards more of the effectiveness of - of an efficiency or conservation program, and then I've got in my mind as - kind of more equity issues as the quality of life comes into play, so you have three "Es" there, your efficiency, equity and effectiveness.

John, did you want to continue with your questions that arose during the responses?

JOHN CARLSON: Well, yeah, if you'll let me.

CHAIRMAN MARCELINO FLORES: Please.

JOHN CARLSON: Well, first of all, I learned a lot and I'm glad to see a lot of this investigation and thinking, but I really have trouble with the word "efficiency." And if you go to the dictionary, it's "maximum output for the least amount."

And what you told me about the hayfield or the grass is that you got equal distribution of the water all over, and then you get to a landscape project where you have different types of bushes in the front and the back, the left, the right, that's not necessarily - so I - and I - I see it in these - couple of these papers we got, the technical paper and the - and the prelude of the study of Phase 2, and I think we ought to come up with a list of these items and a true definition of 'em so everybody's talking about it. But, I really have a problem with your use of the word "efficiency."

Now, if you told me you get more grapes per cubic foot of water and that's a major efficiency or - or more bales of hay, then I can understand; that's an efficiency criteria in my mind.

CHAIRMAN MARCELINO FLORES: And I actually had heard of another efficiency definition which has the reduction of waste from an industry or business so, you know, what - what goes in and how efficiently you use your materials to create a lower waste stream so . . .

JOHN CARLSON: Okay.

CHAIRMAN MARCELINO FLORES: - yeah, you're right.

Was there a response there?

FERNANDO MOLINA: Yeah, you know, the example I gave of a schoolyard was - unfortunately, a lot of the problems that our schools have is they don't have the money to really irrigate efficient or irrigate at all -

JOHN CARLSON: Amen.

FERNANDO MOLINA: - and so it makes it really - it makes it difficult to have a - you know, we've talked about open space for - for families and for kids and this is a problem in a lot of the schools.

Their - their output was a higher quality grass without really increasing the input; I mean, their input to output ratio was improved. Once you start looking at - again, to use schools, you know - if you go into a middle school situation, they might have a track that requires a little bit more - a higher level of playability, and then you get into the high schools and you have baseball fields that have even more. So, that's really where there's a lot of -

JOHN CARLSON: Yeah.

FERNANDO MOLINA: - savings. I know the product is really the condition of the turf that these kids are needing space to play on.

I guess another example that we could use - probably everybody here might be more familiar with - is our toilets because, you know, we're running across toilets, seven-gallon flush toilets that are around from the '50s still. The new ones, the high-efficiency toilets are using 1.3 gallons or less. So, you know, that's - that's - that's your definition of efficiency there again.

JOHN CARLSON: Well, I'm glad to see all that study and looking into it and compiling it and then going back and visiting it, but I just say that I see so many terms that are either new or amorphous or whatever, and I think as we go forward in our papers we ought to have a sheet dedicated to these terms and explain exactly what some of 'em mean.

FERNANDO MOLINA: Yeah, you also - just one other thing that you mentioned that - that's been a big challenge for us at Tucson Water and we're trying to deal with, and that is the mixed landscape types.

JOHN CARLSON: The what?

FERNANDO MOLINA: The mixed landscape types, where you have -

JOHN CARLSON: Okay. Yeah.

FERNANDO MOLINA: - trees and shrubs and - and ground plantings, and this is something that, again, in the next year we hope to address by looking at the landscape standards that we have now and tightening them up so that, number one, the system operates more - is installed more efficiently and has a longer life, and distributes that water more efficiently.

JOHN CARLSON: Well, I could see you coming out with a list of preferred plants and whatever mix or percentage or front and back, things like that that would help the situation along there, yeah.

FERNANDO MOLINA: And it gets more complicated when we start looking at the new technologies that are out there.

JOHN CARLSON: I don't doubt that.

FERNANDO MOLINA: And then we have to match our training programs up to make sure that - I mean, it's - it's really complicated trying to make sure that all this falls into place.

JOHN CARLSON: Well, Marcelino, thank you for - for taking care of my . . .

VINCE VASQUEZ: I'd like to just raise two points: One is as we talk about conservation or efficiency and we talk about it in the form of ordinances or - or new regulations that are - that are to come out or proposed, I think it's important to note that - that these - these ordinances or - or

regulations, they have a cost component to 'em and they have a - they have a projected amount of water that's associated with them that will be saved.

And I think rather than kind of getting all excited and just passing a whole bunch of ordinances that - you know, aimed at - at the goal of - of - a good goal of saving water, that we need to be aware at all times of the cost component of those things, because you basically are buying a water supply, you know, when you conserve water, you're buying a water supply. So, there are - there are cheaper and there are more expensive ways to do that, you know.

Plumbing - plumbing efficiency - or increasing the efficiency of plumbing fixtures is a highly reliable means and it's also a relatively inexpensive means, and compare that to other things like gray water or rainwater harvesting and understand it in terms of as the - as the spectrum in here shows, both the reliability of it and the cost of it; that's just kind of a side note that I just wanted to put out and, hopefully, we have some discussion on that.

And the other thing I wanted to - to - to note was the - Tucson Water's - oh, and by the way - and on the other one - there's a cost component and somebody has to pay that, side note. Come back to that.

(Inaudible; multiple speakers.)

VINCE VASQUEZ: Yeah, right. But the other one is - is the City of Tucson's CCTF program and - and what a great model I think it is in terms of understanding this whole concept. Those - there was a big study that was done and it was a whole cost benefit analysis in terms of understanding - I think it started with like a 100 different efficiency measures and they - they narrowed it down through a screening process that's approved by the American Water Works Association to a short list of 20 which were evaluated in terms of a pretty thorough cost-benefit analysis that understood it, both the cost benefit ratio for the utility, but also the impact to the - the regulated party, or the impacted party and what that ratio might be.

And, anyway, it set this list that this - that this program hopes to fund over time in terms of funding these conservation improvements, and the - the funding mechanism is this three-cent - and now I think four-cent - conservation fee that's attached to all water bills, and so you have this kind of

double benefit where you're - per CCF you're charging more - more per water, so you have this price signal being sent to the ratepayer, and then you also have that going towards giving them solutions to deal with that higher - that higher utility bill.

I just think understanding that model and understanding what we can do with that as - as a community - particularly Tucson Water being kind of the regional provider - what they can do with that is that, as we all know, water rates are pretty - pretty low and there's a good ability to raise them considerably. Well, the cost of service isn't going to go up that much; it'll go up as we improve the system; but, the - there is this ability to raise - to raise that conservation fee so that you have this more robust program that's really going out and funding these - these rebates and incentives and things like that.

And so - I'm losing my train of thought a little bit - but, if we can continue, I hope, talk about it in terms of price signal, the cost of water and, again, always comparing it against supply acquisition; that there's this cost of supply acquisition versus this cost of conserved water. And, as we bump up against our - our portfolio as a region, those - those questions are going to get posed more and more and I think it's something to highlight.

CHAIRMAN MARCELINO FLORES: Great, Vince. Mark and then Rob.

MARK STRATTON: Yeah, and along that same line, I think it goes back to that - the utilities can do what they want to try and focus on - on their way of conserving and being more efficient. The end result, though, is the end user is where it really happens. And you alluded a little bit to it in the report but maybe, Fernando, could you kind of talk about the educational component of the conservation program and how, perhaps, you see that being an integral part of any program that continues on into the future.

FERNANDO MOLINA: Well, in - within our program structure, we - and our budget, you know, we do have this conservation fee now that funds the - 100% of the conservation programming; it's - all we - all we use that money for is two elements: One, are what's referred to as the - the "Conservation Task Force," or the "CCTF" programs, which those are basically the rebate programs.

And we also have our - what we refer to as our "base program." Our base program is what we have typically been doing for many, many years now. This is the program that we have in place that I believe has helped us keep in compliance with the ADWR requirements, and I believe it - it really - it's there because the community demands it. We - we conduct periodic surveys to see what it is that people understand about water and water conservation issues in our community and what it is they want.

We also try to figure out where the inefficiencies are, and our trainings and our workshops are geared towards that. So, we do have programs that focus on residential cus- - specifically for residential customers. We have a series of programs - right now they focus primarily in the landscape - in the area of landscape water use and irrigation water management for the professional - professionals out there. So, we try to get the contractors, designers - we actually like to get property management folks in here because, you know, they're paying for these services and they want things to look good, but we try to explain to them you can also have it look good without using as much water, perhaps, than you are now. So, we try to get those folks involved in these programs as well.

The challenge that we have is trying to make those things connect with everything else that's going on. We - we have a new ordinance that was enacted this past fall relating to water harvesting in the commercial sector. So, we've got - I'm already thinking at - how are we going to revise our programs in the upcoming year to make sure that - that we can build capacity within the industries that will develop, plan, install these things and maintain them, because - and it's easy to say you're going to do this, but if you don't have the people out there - and the capacity and the skills built up to do that, it may not have the impact that you want. So, that's one thing that we try to do is make sure that - that we're meeting that.

We have a proposal coming up for this next fiscal year to do rebates, residential rebates on gray water systems; there's support for that; that was one of the Task Force recommendations. But, we also know that there's a lot of concern - this is something that came through, through our Mayor and Council, and as we went out conducting our Town Halls to get public information on the Task Force report itself - and there is concerns, and I think they're valid concerns - about having - being careful about using gray water. So, you know, here's a connection where we're going to offer a rebate program, but

one of the things we're considering to make sure, number one, that people know what they're getting involved in if they want to install a gray water system and use it and use it properly, is that, perhaps, one of the prerequisites for qualifying for the rebate program is participating in what we're looking at right now maybe an hour or two-hour workshop so that they understand the responsibilities and - and the way to properly manage those kinds of systems; it's an integral part of everything that we do and I don't think - there's a lot of demand for that.

Somebody earlier referenced that we have an ethic here that really reflects the fact that we're a desert community. We see that time again in our - in our surveys. Ninety percent of the responses as to why we conserve water tend to relate to the fact that we're a desert community, and I know you're not going to see that in similar surveys conducted up in Phoenix.

CHAIRMAN MARCELINO FLORES: I think Rob and then Tina.

ROB KULAKOFSKY: Yeah, I just have a comment - and maybe you can comment back about it - one of the things - there's a table in here about suggested regulations and one of the things that - that I really think needs to be done is to have a strong regulation that there are efficient appliances, as well as plumbing fixtures in all homes; give a ten-year period or 15-even-year period that it has to be in place. We had this sort of thing with the changeover in television to digital; enough advertising, enough time and people eventually figure it out; also incentives would help.

The other thing you can go into Home Depot and buy plumbing fixtures that are not efficient and it makes sense to me that if you can't go into Home Depot and buy a can of spray paint without having an ID and all that, why can you go into Home Depot and - and buy an inefficient plumbing fixture or appliance anywhere?

I think that we need regulations to make it illegal to sell inefficient plumbing fixtures and appliances; and it's just a way to get started. Efficient appliances aren't really much more; some of 'em are cheaper; and it - I think that that's a good way to get started.

The other thing is in vegetation, go to Home Depot - sorry, Home Depot - and buy pansies. Come on, you know, these things suck up water all day long; you can't water 'em enough. I've even seen canna lilies in - in Tucson and it's sick; they should - they should not be sold in our community. And, once again, we need regulation of that sort.

I'd like your comments on that and see where - and, also, one of the things about the inefficient appliances and plumbing fixtures is when a home is sold or transferred to another owner, that's a point where an inspection could be done. And, obviously, you don't want the gestapo going into everybody's home, knocking on the door and making sure things are changed, but that's a good time to be able to actually have an enforcement. I'd just like comments on that.

CHAIRMAN MARCELINO FLORES: Were there any comments from the Committee members or . . .

VINCE VASQUEZ: I'm not for or against it, but I think it highlights a good point with the - say, the retrofit ordinance, essentially, is you're - by doing that you're essentially - whatever the cost to retrofit all those appliances are, you're just increasing - you're increasing the sales price of that home by "X" number of dollars and so, you know, wherever we decide to define that - that home or define that cost a home, it - it ultimately gets, you know, some - it goes to someone, and so it just - we always I think have to be aware that if it costs \$2,000.00 to retrofit all of the - the plumbing fixtures in a home and, say, it saves, I don't know, a third of an acre-foot of water per year by doing - or not even that, I'm sorry - like a tenth of an acre-foot of water per year by doing that, just to keep that metric in mind; that, okay, it costs \$2,000.00 to retrofit that - retrofit that house and we're saving, you know, point - .19 acre-feet per year and just keep that in the back of that.

CHAIRMAN MARCELINO FLORES: Our mathematician. It's great that we have those tools.

JOHN CARLSON: Quick comment. You know, these ideas are good, whether they have to be in put in law, but there's a thing called "publicity," and I'm all for that immediately.

And, you know, your low-flow toilets, they have problems in certain areas of - of the City or this community where you have to add water to move that stuff downstream. So, you know, it's good to get the publicity out there, but whether it's a specific law or not, I think we have to go pretty slow. And even the gray water says it's not when you change the house; it's when you build a new house.

CHAIRMAN MARCELINO FLORES: Okay. We're kind of distracted a little bit by a conversation on the east side here, but I - a comment that I had that kinda raised in my mind was - was the

water quality and investing in such appliances and then, you know, having the water quality become an issue, you know, with it scaling up and having to replace it sooner and the like.

Any other comments to - from the Staff?

FERNANDO MOLINA: I wanted to address some of the items that you brought up there. I think as time goes on we're seeing prices of a lot of these appliances, in particular, coming down lower and lower. As we're going through our rebate program, there are some fixtures out there, HET fixtures, that meet our requirement that are selling as little as \$80.00 per fixture, so the rebate's \$40.00 for them; it's a pretty good deal.

Clothes washers - I think horizontal axis clothes washers, which is probably the next - or the biggest user in the home, I think we're beginning to see the prices on those come down.

One of the things - one of the tools - somebody mentioned something about tools - and one of the tools that we have as a utility to get people to think about these - besides publicity - is our rate structure, and our rate structure is designed so that that person that does want to plant grass - which, fortunately, in our community or at least in our service area, lawns really aren't - aren't a big problem for us, we just don't see a lot of that, but for the people that want to buy the pansies or the other things, you know, they learn really quick; that's going to put them into the next usage block and - and that water becomes a little more expensive. So, we do, as a utility, are fortunate that we have a rate structure as part of our toolbox to get people to make better decisions and we're fortunate because not - not all utilities in Arizona have the kind of rate structure that we have to kind of reinforce that message more.

CHAIRMAN MARCELINO FLORES: Tina?

TINA LEE: If I could bring you back to the education programs, Fernando. I think the - Tucson Water's done a fantastic job with conservation education, but one of the problems that I hear in the community a lot is, you know, darn it, we've conserved so much and now our rates are going up? I think there's a lack of education message about just what it costs to run a utility and it's contrary to what people say in terms of, you know, if I turn off all my lights my electricity bill goes down; if I don't use as much gas, whatever, so they're used to that connection. And I was wondering if you guys have worked

on any kind of a message about that in terms of the - you - by conserving, like Vince says, we're really sort of buying a water supply -

FERNANDO MOLINA: Right.

TINA LEE: - and so that's the benefit, but people don't see that in terms of their monthly water bill, and so I'm not sure if - if you guys have sort of thought about a message and how to connect that for the users.

SANDY ELDER: You've got a really good point, Tina, and I think this is a difficult one for the community to work with; it's a very - it's a very nuisance - it's not just a straight black-and-white message, I know. And we're kinda - it's got kinda the long-term view; it's got - you know, so there's maybe no short-term benefit, but the benefit is out, you know, in the future decades or something.

You know, we're certainly seeing a lot of talk about changing pricing on energy swirling; that could totally upset our rates because we're so energy-dependent as we talked about over last summer and such. So, then that might dwarf anything an individual gets through conservation efforts on water, you know.

Obviously conserving water conserves energy, too, but - so, it is going to take the - our customer base to get more knowledge going; I think maybe it does behoove us to try and work on some education materials to show the nexus. You talked about the cost to run the utility. Maybe we have to become - you know, instead of doing Beat the Peak, we'll have to do Water - Water Finance 101, or something. I don't know. You know, these are the . . .

TINA LEE: Or even some way on the bill to distinguish between what they're paying for the commodity in theory and that may be - you know, in terms of the block rates, but sort of a base level that everybody has to pay into for maintenance of the - of the infrastructure.

SANDY ELDER: Well, that's built into our cost of service -

TINA LEE: But that's what I mean -

SANDY ELDER: - structure.

TINA LEE: - pull it out somehow so people can see that. I'm just - I'm not -

SANDY ELDER: Yeah.

TINA LEE: - making a suggestion that it has to be there -

SANDY ELDER: Yeah, and -

TINA LEE: - just some way to make that disconnect - or the connection between that conservation does buy you something -

SANDY ELDER: Right.

TINA LEE: - but it may result in an increase in rates.

SANDY ELDER: Okay. We'll think about it.

CHAIRMAN MARCELINO FLORES: Val?

VAL LITTLE: If I could just make a comment. I - I think what we're seeing - and I'm sort of predicting here - we're going to see a different way of looking at rate making. I think that rate making has become - being done a certain way and rates have been established. What I think's going to happen with the downturn and the - the abrupt stop that we've experienced with development and that sort of thing, I think we're going to see our rate structure changing so that we will eliminate that rate increase as a result of saving water. You've got to redistribute your base charges and your commodity charges and change that whole philosophy, and that's part of your education is to explain to the public why their rates are changing and why your base rate may be much higher and your commodity rates are much steeper because it's not - there isn't a - there's isn't a good match up; that - that either growth has been paying - new development has been paying for some of the existing customers, or something's hinky, because there shouldn't be an increase in - in rates as a result of conserving water if your rates are - are structured in a different way.

SANDY ELDER: I think the challenge is that - that different way - that structure of a different way.

VAL LITTLE: Right, it's the structure.

SANDY ELDER: I don't see it yet, but we're -

VAL LITTLE: Right.

SANDY ELDER: - going to have to work on it.

VAL LITTLE: I think that's - I think that's where we're going to go.

SANDY ELDER: Okay.

VAL LITTLE: I think rate analyses and - and rate consultants are going to change how they do it -

SANDY ELDER: Okay.

VAL LITTLE: - because everybody's been caught -

SANDY ELDER: Okay.

VAL LITTLE: - they've been caught short.

SANDY ELDER: Good point.

FERNANDO MOLINA: There's actually one other thing that I've observed, and that is: We can - for many years we were - we were able to fairly accurately project the impacts of conser- - of our conservation programs, and I think one of the - one of the things that kind of has us scratching our heads is we've seen such a tremendous drop over - much more than what we anticipated, and that's really - I mean, we can project based on - on the planning studies we've done to look at changing toilets out and those sorts of things. We can project what the reductions will be. We can build that into costs of the programs and future rate increases. But when we - when we have what's happening - what's been happening for the past five years or so where we don't really know exactly why. There's probably some reasons that we could look at and say, "Well, they're responding to something," but it's - it's a much greater response than we anticipated; that's - that's when it gets hard to try and explain, you know, the unexplained.

BRUCE GUNGLE: It became hip to conserve water; I mean, straight up, that's what it was, you know; it caught fire and everyone's talking about it. I don't know. Is somebody else in the cue?

CHAIRMAN MARCELINO FLORES: I'm sorry. No, you.

BRUCE GUNGLE: I'd like to move to a slight- - slightly different area. This is page 25 of 32 of the paper, scope question number two - and this - this goes to what I always find to be something - I don't know if "fascinating" is quite the right word - but entertaining question, anyway, which is: How can the City and County work together to ensure that water conservation protects our future water supply, not simply makes more population growth possible?

And it - it seems to me that there are really two things that limit growth in our community, and they're land and water, and if you have people using less water at the end of the day, you're going to have water available for more population, and I - I don't see how that can be disputed no matter which way we cut it with language, and so we ought to just go ahead and say it in the report, rather than this paragraph that tries really hard to figure out a way to get around it, but - but, in the end, really doesn't, so . . .

CHAIRMAN MARCELINO FLORES: Vince and Bonnie?

VINCE VASQUEZ: I think - I - I mean, a better way to say it is that - is that you'll have more efficient use of water so, hopefully, that the - the remaining portion gets allocated towards uses that are - that are more over - have an overall beneficial impact on the regional economy or the region's quality of life, et cetera. I mean, it's not just that it's - they're going to go towards more people; it - it goes, hopefully, the - the efficiencies - I - the way I see it is that as prices rise up and people respond to that in - in higher valued uses - or uses where that water has more economic benefit, that extra water goes towards there so that you have this kind of - this kind of, you know, an efficient allocation of a scarce resource.

BRUCE GUNGLE: Sure, that - that's fine but, in the end, it still makes more population growth possible; I mean, it just does. I, you know, I'm - it's not a value judgment thing -

VINCE VASQUEZ: Oh, no.

BRUCE GUNGLE: - it's just - it's a fact.

VINCE VASQUEZ: No, absolutely.

BRUCE GUNGLE: Yeah.

CHAIRMAN MARCELINO FLORES: Bonnie?

BONNIE POULOS: Thanks to Bruce, that's a segway into some of the comments I had about this report. And I think this - this report, although it's trying to focus on the quality of life on the residents, I really think has an over-emphasis on new construction in many ways, and I think that what we also - I mean, I think to focus on how we can conserve in new construction is easy. To focus on how we

deal with water conservation in the already-built environment is much more difficult, and I think this report really avoids dealing with it in a number of ways.

And I think that for one thing they're talking about how it's only through a rezoning process can you really implement some of these conservation efforts, and I disagree with that. I think that a lot of the built environment is being redeveloped, and when you redevelop land you change the use, you ask for variances, you ask for special permits, you ask - you need new permitting. You also ask for certification for things like the green certifications for buildings. And some of the things that we can do are set standards.

You can be - have lead certification, but at the very baseline - and it's not a pick and choose - you have to demonstrate that you're conserving energy and you're conserving water over what is being used today; that would be a mechanism where we could use a redeveloped project, or an area where people are adding on to existing structures, to now go in and say, "Well, fine, you were grandfathered in when we changed this rule and we wanted to conserve more water, but now you're changing and now your grandfathered rights need to come into compliance."

And I think there are lots of way that we can try and provide ways and recommendations to the governing bodies to how they can really emphasize water conservation, not just through proscriptive measures, but through incentives and rebates, and through the permitting process that we can say, "Now you're going to be required to conserve."

And I don't think it's necessarily fair to say, "If you sell your home, now this home has to be energy efficient or you can't sell it, but if you're going to add on to your home or you're going to tear down that home and now build a new one, even if it's the same square footage of what you've torn down, this is our opportunity to take the built environment and make it more conservative." And, in that way, we're using conservation really to help the quality of life of the existing residents who are here. And I really don't see that emphasis at all in this report.

And - and I'll give you an example, on the tables - you have two tables, Table 1 and 2 on pages 18 and 19, and Table 1 deals with new construction, conservation goals, strategy and mechanisms, and you have five topics and you start with environmental. Then you go to existing con- - construction,

conservation goals, strategy and mechanisms, and there's no environmental section at all when, under environmental section, we could be providing shared open - urban open space. We could be doing things to restore wetlands or washes within the already-built environment.

It seems to me that we really shortchange what we can do and what we can recommend under existing construction and in the already-built environment. And I think part of our charge under this topic as a Committee is to try and provide some of those ideas to the governing bodies so that we're not just putting in new ordinances, but - we're finding ways that deal with new construction - but we're finding ways to be able to create incentives and to create benchmarks where we say existing development now has to meet these goals. And I think that's going to be crucial and that's the only way you're going to get away from saying, "If I conserve, I'm only - I'm only conserving in order to allow more people to come here."

And, instead, if we look at it and say, "Well, if you redevelop and you put in these energy-efficient appliances and you do measures to not use as much water, then maybe we'll give you a break on your taxes or we'll give you a break on the permits that - that you need, the cost of the permits."

And - and we need to also look at the obstacles to people being able to renovate in a cost-effective way that makes them more energy efficient, because I think there are obstacles within the current codes that do put up barriers to people being able to afford to make those efforts. And I'd really like to see some of that emphasis in this report that I don't see now.

Oh, and I have one very important comment I need to make. On page six, in the second paragraph, you mention the Planning and Zoning Commission, and I didn't know that the ultimate land use approval decision rested with the Pima County Planning and Zoning Commission; it does not. So, I would like to make a recommendation -

BRUCE GUNGLER: Do you want it to change?

BONNIE POULOS: - that you change - no, certainly not - that adverse impacts can be mitigated through rezoning conditions by way of the Pima County Planning and Zoning Commission, but the ultimate land use approval decision rests with the Board of Supervisors, because that's the way it really is, so if you could make that correction.

BRUCE GUNGLE: No, we should move this forward as an ordinance.

BONNIE POULOS: Yeah, well, we could.

BRUCE GUNGLE: (Inaudible) control.

BONNIE POULOS: Then I think the make-up of the Committee would change. Okay.

And I don't know if anybody has any comments on what I just said, but . . .

CHAIRMAN MARCELINO FLORES: Suzanne does.

SUZANNE SHIELDS: I - I would like to make - make one - and maybe we just weren't clear enough in this because, boy, this was a hard paper to put together 'cause we had everybody from Tucson Water and, as Melaney said, you could do 30 pages - and then we were trying to add and talk about the land use element.

For us, new construction means when you have to pull a permit, not just rezonings. So, I guess, the - the real discussion is - is: What is that tipping point? Clearly, if somebody is tearing down a structure and rebuilding it, you know, that's totally new and any of our ordinances or requirements for buildings should apply. And so I didn't want people to think, oh, you - 'cause you are not grandfathered in.

I guess the question is - I'll tip my hat to Vince over there - is - the question is: If somebody's coming in and they're just replacing their hot water heater, is that enough for us to make them replace all the fixtures? And it may not be.

So, there needs to be maybe clarification here that it's not just rezonings. Rezonings give us the greatest flexibility, but any new - new infill, new construction, any new construction when you get a permit, that's when a public agency has the right to make and request some changes.

BONNIE POULOS: But I think when you simply refer to it as "new construction," in people's mind that is new development on virgin land, and I think somewhere you need to emphasize redevelopment and that may mean new construction, especially if you tear something down and put something else up there.

But, when you're talking redevelopment, then you're getting people to think about the fact that what we're doing is we're enhancing the already-built environment. We're not simply building on virgin land that was once something we could enjoy as open space.

And I think that there's this real mind set that I got from reading this where if I were just a member of the general public I would think, well, this is - this is a choice between those of us who live in existing homes not having to do anything and not having any ability to really get a break if we want to improve, and all the emphasis is going to be on new construction. But redevelopment gets you thinking that, oh, well, if I add something on, then I'm going to have to do this as well.

MELANEY SEACAT: Bonnie, we will absolutely develop more along those lines and happy to do that. I'd like to ask if anyone from Development Services wants to talk about what we are doing relative to incentivizing those kinds of things, because we did have some of that in there, but we didn't focus on that and I'm not - you know, just to get back to our scope question - we - we tried to respond to where is there opportunities for consistency and ordinances and standards? And I think one of the conclusions in this is that from a regulatory standpoint it's not as easy to regulate the existing built environment, and that the opportunities there are really in the area of education and, you know, price signals and rebates and all of that, which Tucson Water does fantastic work with, but that the opportunities for consistency in the regulatory environment were in the area of new construction. So that's why we focused on that, but it's not to give short trip to the opportunities for water conservation within that domain and we'd be happy to develop that. So, I don't know if anyone from Development Services -

CHAIRMAN MARCELINO FLORES: I had a hand up over here. Are you -

MELANEY SEACAT: Okay.

CHAIRMAN MARCELINO FLORES: - with Development Services?

MR. HUDSON: No, I'm not with Development Services -

CHAIRMAN MARCELINO FLORES: Oh.

MR. HUDSON: - (inaudible; not speaking into a microphone). Bonnie brought up some

...

CHAIRMAN MARCELINO FLORES: Can you come up to the microphone, please?

MR. HUDSON: (Inaudible) Hudson, I work for council member Romero, the Vice Mayor.

Bonnie, we're working with a developer right now who is wanting to do a no-flow toilet fixture and they have to pay the same fee as a toilet fixture that uses whatever flow. And so your example of how you incentivize it, well, if they have to pay the same rate no matter how much flow goes through the fixture when there - I mean, whether there's a lot of flow or there's no flow, where's the - where's the balance in that? How do you - how do you incentivize people that want to do - use the low-flow or no-flow fixtures?

VINCE VASQUEZ: I think, Bonnie, you raise a really good point 'cause something I've always seen is - is it kinda gets into the whole question of bang for your buck, and the - the older - the older housing stock in our community is - is quite a bit - quite a bit less efficient than newer - than newer construction.

To get newer construction to the next tier of efficiency is - is more costly per unit of water saved than it is to take that same money that would've been invested in getting that house or that commercial development to the next tier of efficiency, via it through better - better efficiency plumbing fixtures or through rainwater harvesting, or whatever. Better to take that money that has - saves this amount of water, commit it towards the retrofitting of the central city neighborhoods and businesses and it's - for the same amount of money saves this much water, and it really just - everybody in that - in that instance wins because we're actually - we only have so much money that we can spend towards water conservation in this region any given year, and the more we get out of that money spent, the better off - the better off we are.

And just - what was I going to say? I need more caffeine. I'm having lots of - lots of issues tonight.

CHAIRMAN MARCELINO FLORES: We have about 15 minutes left on the topic. One of the comments that I had for - for Bonnie's comments was that, again, kind of what Vince was touching on is the NESI curve comes to mind and what are the effects of the built environment, you

know, development or redevelopment. What strain would that cause to the existing infrastructure? And I don't know if there's a response for that at this time.

But, before we get to that response, was there someone from Development Services that was going to be - talk about the incentives or the redevelopment or what's being done, proposed currently?

MELANEY SEACAT: I'm inviting Rich Franz up. You can come to the panel table if you like, Rich. Rich Franz-Undar is the green building manager for Pima County Development Services and he can speak to our incentives for Leap.

RICHARD FRANZ-UNDAR: Just a little bit about the program that we offer is we have a regionally-developed green building program which looks at energy water material efficiency and indoor air quality, and we also offer the Leap for Homes Program which is a national program.

We started out with what we thought was a really cool incentive because Development Services is a self-funding entity, so we didn't really have any money that we could give back as an incentive, but we were going to put you at the top of line, so we were going to give you a five-day turnaround on your permit reviews; and for a while that was a really great incentive, but right now everybody's getting five-day permit reviews, so that one went away.

One of the things that we did look at - and we did put the proposal forward and we still think it's a worthwhile idea, but it's just not quite the right time for that - is deferring impact fees towards a later phase in the project, as opposed to an earlier phase in the project, and that's - we haven't implemented that, we've talked about, and that's something just kinda changes the income stream, but it's a big help to developers because that fee comes at a time when they're about to see their revenue stream increase.

BONNIE POULOS: What about the problem with developments that don't get finished? Are they still required to pay the impact fee after a certain period of time, or is it really geared towards how much of the development is completed? I have a fear -

RICHARD FRANZ-UNDAR: That -

BONNIE POULOS: - because infrastructure is put in regardless of whether it's full or half empty.

RICHARD FRANZ-UNDAR: Well, we have some cases now where infrastructure's been put in and then, for economic reasons, the - the development's not going forward, but that's one of the administrative difficulties of trying to figure out how to administer this.

VINCE VASQUEZ: Marcelino, I remembered my - my little anecdote. Can I tell it now?

CHAIRMAN MARCELINO FLORES: Okay. Vince and then John.

BONNIE POULOS: I'd forgotten the -

VINCE VASQUEZ: I swear I'm sober. No, it goes back to the existing - existing, you know, City - and there's a quote in the CCTF that there's 225,000 or 250,000 toilets that are pre-1993, meaning they use like 3.5 gallons per flush or more per toilet. The newer ones we all know that they're in the 1.6 to now even 1.3, or even lower potentially. And to get them from the 3.5 or 3.3 down to the 1.6 is a pretty cheap toilet.

And - and there's an incredible amount of very reliable water supply that we can harvest out of - of existing housing, and - and it really is something that is - is measurable; it's something that we can really watch; the - the community can kind of - can see the progress. We can see that there's dollars going into a program and that there's - there's - there's really reliable water savings associated with taking that toilet out.

And I just would encourage us to consistently think about ways that we can - we can - both measurable, reliable and cost-effective means, particularly that if it does have an equity component to it too in terms of helping out, you know, central city neighborhoods and stuff like that, so . . . I thought it was good a anecdote on that.

CHAIRMAN MARCELINO FLORES: John, then Bonnie.

JOHN CARLSON: If I remember right, the rehab or refixturing the house for gray water is when - is when you built a new one after 1911 or 2011, rather - I'm just a century off - but, anyway - and so there's that as far as this redevelopment.

Now, on this cost of this and why do their bills keep going up, they better get ready 'cause if Obama's thing goes through with all this alternative energy - and it's going to be extremely expensive - and I'm not saying I'm against it - but let's recognize it.

And then from a Committee standpoint we were looking at sustainability for what population over what period of time; and I think, like he said, you get more water, sure, you can have more people, but somebody's going to want more frog ponds, too. So, all these things have to be kept in mind as we go forward. Enough said.

CHAIRMAN MARCELINO FLORES: Well, we have ten more minutes on the topic. I had a question - I don't know if it was a comment from Staff - regarding the impacts to the existing infrastructure for redevelopment.

FERNANDO MOLINA: Yes, I wanted to address that because one of the - one of the main focuses - actually, I'm sure - I'm sure all of you went to our website, got the link to look to our Task Force report and read it completely from page to page. The big challenge that this group had as they went through their process was, in general, they were to look at ways to reduce water use into the future, but the big challenge they discovered early on was: How do you deal with the existing housing stock?

Vince referenced a number - I'm sure - I'm sure he knows the page that the table is on in here, he - I'm sure he looks at this a lot - but that's what the main focus is on, and that's what we're trying to do is provide incentives for the existing homeowners, the existing businesses and the existing industries to look at how they're using water and giving them some opportunities, some financial incentives to implement these changes.

On the educational side of things - we talked about this earlier - we're working really hard with the business community to try and think - not so much about how much is your water bill - but think more in terms of how much water should I be using, compared to how much water am I using. Coupled with that, we have these incentives to maybe encourage them to make those changes.

Marcelino, I think you asked about the NESI curve and the impacts on the infrastructure. I think one thing that - that has bothered me over the years is when we start talking about water efficiency, we tend to focus a lot of our views on - on the end user, but one of the things that I look at also

is we're basically - we're spending ratepayers' money. When I do presentations, you know, I like to tell people, "I want to make sure that the money we spend is as effective as possible and we're getting the - the impact that we want."

And one thing that I think often gets left out of the discussion is - is looking at infrastructure, you know. One of the first things we tell our customers to do is go to your home and find your leaks and fix them. I mean, a lot of people will tell us they found 'em; they don't fix them. And I think oftentimes we - as a utility, we as a community, need to give the utility that same opportunity; to find our leaks and fix them.

I think that often if you're looking at a reduction in water use through that increase in efficiencies that you gain, I often think dollar-for-dollar going through the distribution system and bringing that to a higher level of efficiency in terms of reductions in losses might be - you know, I think Vince used the term "bang for the buck" - you might get - you might get it there first, but also try and distribute some of that throughout the community.

CHAIRMAN MARCELINO FLORES: Yeah, and I was thinking that redevelopment might actually cause - I mean, coupled with conservation - it still might cause an increase in use and that's kind of, again, more - more reason to look at the - fixing the leaks, but . . .

We have probably ten more minutes on the topic. Bonnie?

BONNIE POULOS: Thank you, Marcelino. On page four of the report, in the second paragraph, I was really amazed at how much energy is consumed and greenhouse gases are released through our water utility companies, and it got me to thinking about energy costs as they relate to water and wastewater, wastewater treatment and water distribution.

And it seems to me that when we were talking recycling 20 years ago, the thing that really set recycling off was the use of recycled products by governmental agencies, and that really stimulated a market that was something that benefitted the public because the public was now able to recycle and the government was able to save money over time because these products were becoming more and more in demand.

And, in that regard, I think that if Tucson Water and Pima County Wastewater really are going forward with plans for redevelopment, like through ROMP, then I think that it's really important to factor into those projects energy alternatives, like solar energy, and the amount of rooftop that is going to be used in the new wastewater treatment plan is significant - so rainwater harvesting, whether it's passive or active - and in this way that huge project, just in and of itself, is going to stimulate a market in this community that isn't there currently, and could have a positive benefit to the public at large who wants to be able to do that, plus it sets an example that we are setting the example for what citizens need to do. And I think it's something that we're not really looking at because, yes, making that leap is very scary and it is somewhat expensive, what we're talking about a billion-dollar project just talking about ROMP.

I had one other comment - that I a question about really was on page three there's a comment about - it's a footnote - about large turf users not being subject to the water per-capita use targets if they use only reclaimed effluent, and I'm trying to figure out how that promotes a conservation goal. Just because the water is effluent, shouldn't there be a limit and a restriction, even if it's not as restrictive as if they were using potable water? But it just seems really backwards, and is that something that 's decided at the State level, or is that something that can be decided on by the people who own the reclaimed water?

FERNANDO MOLINA: That's actually a requirement imposed by the Arizona Department of Water Resources, and I think it's - well, and I think - 'cause I used work with - many years ago in my other lifetime, I worked at ADWR, and I think that incentive - that's kind of an incentive to get people to use reclaimed water.

Within Tucson Water, what we - if you look at our goal - I mean, our main goal is to protect and enhance water resources, so that doesn't - it doesn't matter to me as I tell people - whether it's local groundwater, Colorado River water, or reclaimed water - efficiency and making the best use of that water, whatever the process is, is really what we're trying to get people to think about.

CHAIRMAN MARCELINO FLORES: Rob?

ROB KULAKOFSKY: Along that - those lines, on page 9 of 32 under "Rates" it talks about these rate structures are designed as either increasing block rates for residential customers, or a base

rate summer surcharge structure for commercial customers. What got my head scratching was exceptions include a flat rate use for multifamily and reclaimed customers. Now, you just explained the reclaimed customer aspect, but what about multifamily? If you have an apartment complex with 300 apartments in it, are you charged the same amount as someone who has three apartments? Is - are you charged a certain amount per unit?

FERNANDO MOLINA: The - yeah, let me explain our - our rate structures.

ROB KULAKOFSKY: Thank you.

FERNANDO MOLINA: This - and this information's on our website as well, if you click on "billing" in customer service, the rate structures are in there.

Our residential rate structure and our duplex, triplex, also, I think fall under the increasing block rate structure. Our commercial and industrial, we use a different rate structure; it's referred to as the "base rate summer surcharge," and that's designed to - to -

ROB KULAKOFSKY: I understand that.

FERNANDO MOLINA: - get people to focus on their summer peaking water use. The multifamily rate has its own rate; it's a flat rate; it's a uniform rate.

Our rates and our - our fees are determined by cost of service, and one thing that the - as I recall the multifamily association was able to successfully lobby Citizens' Water Advisory Committee - looking at their particular water use characteristic, they have a fairly flat - they don't have a big peaking factor for a variety of reasons, and so they were able to successfully come in and make an argument, and - and it was approved by the Citizens' Water Advisory Committee to put them on a flat rate structure, which is similar to what we have for the reclaimed water rate.

CHAIRMAN MARCELINO FLORES: We're almost out of time. John?

JOHN CARLSON: Well, I'll make it quick. The water resource publication, good ole Sharon Megdal's thing, got some interesting things in there. One lead article is Las Vegas has severely cut down the amount of turf you can have on an individual golf course.

And in here there's another article saying, "A, pay off some water savings practices, they have down-the-line costs, and that's the use of gray water, because then you have less water that you can treat and - and use for - for other purposes, including, you know, for the environment.

So, all I'm saying is this is a good thing. I'm sure you've been in touch with what she does and she had a big conference the other day, and I'm sure that you'd benefit of what's come out of that, too.

CHAIRMAN MARCELINO FLORES: I'm wanting to adhere to the - to what Jim had said and I think he had opened it up to the audience to make some comments, suggestions. I know Val had some closing comments, but very brief, please.

VAL LITTLE: I'll be very brief. This has been a great discussion, and I just wanted to make a comment having to do with sewer flows, and there's been talk about the cost benefit of retrofitting in existing neighborhoods.

I just wanted to remind folks - and Eric can certainly correct me if I'm wrong - but I believe we're operating under the same specs that we have been for decades, and we have now 17 years of housing that has been required to have 1.6-gallon-per-flush toilets or less. So, unless there's something happening that I'm not aware of, it seems to me that we're on pretty - pretty solid ground if we targeted those pre-1992 neighborhoods and tried to get those toilets retrofitted. I think it's unlikely that we would see any kind of wastewater maintenance in the conveyance system that wouldn't entail some sort of flushing at some interval.

CHAIRMAN MARCELINO FLORES: State your name, please.

WILLIAM CROSBY: William Crosby. Certainly, efficiency is a huge part of conservation, and I would really support an updating of the educational programs that Tucson Water has.

Coming to Arizona, I assumed that if you sprayed water on the grass, the grass would grow. Soon I found that the water was not getting to the soil because of the hardness of the water, combined with the fibers on the ground. The intense heat and the sun created this layer that stopped the water from getting to the ground. And I have horse pastures on the east side and this is, indeed, the case, so that spiking became a way of life; that I find a lot of people with big turf projects have no idea what

that does, because you roll a spiked wheel over the ground and it creates holes that then the water can penetrate into the ground.

So, there - there are lots of techniques that are used like with plants or shrubbery. Use of mulching is almost essential here which keeps the ground moist. So, I would certainly support an elaborate education program. Thank you.

CHAIRMAN MARCELINO FLORES: Thank you. Nancy?

NANCY FREEMAN: Nancy Freeman, Groundwater Awareness League. Now what I thought was missing in the report was a comparison of how much water is commercial, apartment; to break that out because we do know most of the - a majority of the water does go for outdoor use, and so how much of that does go to commercial and business? Because, from my eyesight, I see it is a lot of the commercial that have the lawn; that have the spraying and the sprinklers. I was at a resort and I swear they were sprinkling the grass every day. I was just, you know, obviously shocked so - because that's not necessary.

And I do agree with Rob that it's not just Home Depot you walk in and see pansies and (inaudible) and (inaudible) all these high-water plants. ADWR has a very good chart; they have how much water usage each plant uses; it's already all figured out and so you just have to stop the sales at the nursery; that these high-water-use plants are not to be sold. And, again, I see most of the high-water-use plants in commercial plantings. Thank you.

CHAIRMAN MARCELINO FLORES: And I think before the City comments, I think the Phase 1 report does break down the -

FERNANDO MOLINA: Yeah.

CHAIRMAN MARCELINO FLORES: - the industrial/commercial uses, but if that -

FERNANDO MOLINA: Yeah, I was - you know, I held this big book up - I know it's a little daunting to look at - if - if you go to Appendix F, which is the last portion of that, is the - is the consultant report, there's a breakdown by sector of water use, and within each sector it's a breakdown of interior/exterior, and in the interior it goes into much more detail in terms of - of toilets and things of that nature there.

As far as seeing the prop- - going out there and seeing the properties and the properties that we do have out there, again, one of the other big challenges that I have as we try to move our - our conservation programming forward is there are a lot of properties that were built prior to 1991/92 when the building codes changed; these are the ones that still have a lot of grass; these are the ones that you're driving down Broadway or Twenty-Second or - you know, you can see where - when Tucson areas were developed based on the landscape types out there.

One of the things that we've done - and I think we're being really effective with - is two years ago we were authorized by Mayor and Council to hire two new water waste inspectors, more commonly known as the "Water Cops," and I can tell you this: In the two years that they've been - coming up on three years now, not two and a half years - in the two years that we have had them focusing strictly on enforcing the water waste ordinance - which actually was modified in 2002 to make - to broaden the definition of what constitutes water waste within our service area - we have taken more people to court, more companies, more property management firms, more commercial property owners to court. We have not lost one case.

We have to - again, this is where we have to try and balance, we - that's what I call our "big stick" and we have the big carrot, we have our rebates programs that we try to do and we have our education programs that we try to make sure the landscapers that are providing the services out there have the knowledge to make sure those things don't happen. So, we - again, it's a big challenge trying to juggle all these things together to make sure they work together and have an impact in the community.

CHAIRMAN MARCELINO FLORES: All right. I want to extend our thanks and I think to wake everybody up with a round of applause.

(Applause.)

CHAIRMAN MARCELINO FLORES: It's taken us five minutes over so, perhaps, we can shorten our break by five minutes if that's okay.

JOHN CARLSON: Whatever you say.

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(Break taken at this time.)

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CHAIRMAN MARCELINO FLORES: Please, if everyone can find their seats, please. We neglected to include announcements as part of the Agenda, but I wanted to take an opportunity to - to have the Committee or - or - bring up any announcements, but first with Nicole to give a couple comments on the Mayor and Council presentation and the bound first phrase report that we have before us.

NICOLE EWING-GAVIN: Thank you. So we forgot to mention we had handed around to you all the - a bound version of the Phase 1 report, and it's been just about a year since we started, so it took us a year to produce this. It's not as thick as we thought it would be since - when it's double-sided, but this doesn't include all the appendices which are posted to the study website.

And the report was presented to the Mayor and Council in April, and to the Board of Supervisors in early May; both governing bodies endorsed the work of the Committee, endorsed the report, and the comments were very positive. The - I think the comments tended to focus on the need to - even though they want this Committee to continue to oversee Phase 2 of the study - that we need to keep reaching out to other jurisdictions in the region and make sure we have an inclusive process, so the comments tended to focus there.

Were there any other - what else did they say? Do you remember, Sandy? That was kinda it; it was sort of a "rah-rah" thing. They thanked the Committee. Jim was the only one there to receive the thanks, but he thanked them on behalf of you all.

UNIDENTIFIED FEMALE SPEAKER: (Inaudible; not speaking into a microphone)?

NICOLE EWING-GAVIN: Yes.

CHAIRMAN MARCELINO FLORES: Okay. And if every - every Committee member, I believe, received a copy of a - of a notice or invitation for the jurisdictions and municipalities that was issued.

Were there any other announcements?

(No response.)

CHAIRMAN MARCELINO FLORES: Okay. We'll be moving into our next topic then.

The discussion on stormwater management and we have Suzanne Shields leading the discussion.

SUZANNE SHIELDS: Thank you. In doing all these papers, we have these short one-sentence questions, and for this was: How best to use stormwater and rainwater as supplemental water? And it's a short question, but it's a very complicated question. We tried to look at this paper - we tried to look at it with our major tributary watercourses, like the Rillito, CDO, Santa Cruz River, how can we best manage them?

More look at regional sub-watersheds and you can't see from here, but this golf course that we're sitting next to is actually a stormwater detention basin that the City and the County constructed together back in 1996, and the Arroyo Chico comes in at about 3,200 CFS in 100-year flow, and it flows out from here at 300 CFS. So, these are what I would call like a regional-type basin.

And then you get into major rivers and these kind of basins are more flood control, and you get into floodplain management issues which are handled by each one of the jurisdictions. We all have certain common things. But we were also trying to look at the built environment and the future environment, 'cause they have different challenges and different opportunities; it was difficult to provide flood control in this area except by rebuilding the stormwater facility here.

Some of looking at what we can do with stormwater and rainwater has to do with just physical characteristics. The geology here is quite different than might be in some other location. A gentleman mentioned about his pastures. We have some places where the caliche is so thick, you know, when they build something they basically blast. So, talking about trying to think about recharge of rainwater in an area like that, it's not very helpful. Yet, we're fortunate that we have river systems with a lot of fractured rock and fractures that - that they act as infiltration galleries.

Obviously, there's times when we have more rain. This is unusual to have rain in May. During periods of drought, what we see is that we don't have the winter rains, and that's an important element for stormwater harvesting because that gives you two seasons in which you can collect water.

There's many legal constraints. Who owns the water? As soon as it goes into a channel it becomes surface water rights and most of the surface water, for practical purposes, has been already appropriated by somebody.

Other legal constraints have to do with water quality. We really need to work with the Department of Environmental Quality so that we can put reclaimed water in washes and we can put stormwater back into washes, and we can blend the two because right now there's some legal constraints about doing it.

And then some of it's the cost-effectiveness, and this was something that we really struggled on and there's no one answer that is correct on what's cost-effective. Obviously, building a detention basin here as we did, it was more cost-effective than ripping up a whole bunch of storm drains and doing a storm drain system, but it was still - it was very expensive. This was about a 13-million-dollar project; about five million of it was the golf course, the amenities, the other portion was the flood control aspect.

So, there - there's tradeoffs. There's a lot of benefits in terms of just any drop of water saved is a drop of water saved. There's a lot of environmental water quality issues that make these things cost-effective.

But, to keep it short so you can ask us questions, is one of our recommendations is maximize the use of rainwater and stormwater harvesting on lots. And we've been looking at different types of best management practices, not so much collecting it into a container for reuse, but how to do it more passive; some way that we can quantify how much water could be kept on a lot and not released.

We have the built environment where we can still do a lot of explaining and training to people about how to harvest water; it's a little bit harder when your house is already built, but certainly there's times that you can make improvements.

Future development - and by "future development" it's both the infill and new construction. We can - as the City is doing, requiring commercials to do stormwater harvesting. But, future development, we need to look at some new standards and some new paradigms about how - what we do with stormwater; something that can be agreed upon by all the different jurisdictions.

We'd still like to see the maximum use of stormwater in neighborhood scales. So, if you're doing a subdivision development, how can we harvest the water so that it self-sustains the buffer yards, self-sustains the roadway landscaping?

One of the key things that we've seen in looking at our river systems is to limit floodplain encroachment; keeping the rivers as natural as possible. The Pima County Flood Control District has a very active flood-prone land acquisition program, and part of that has been to buy up the upper CDO, Cienega Creek, and the upper Santa Cruz River because of the natural floodplain functions. Keeping it natural, one, reduces downstream flood peaks, but also allows for the natural recharge. When we're running our flood warning system - it's really obvious on the CDO that is such an infiltration gallery - we'll see flows coming out of Pinal County and we'll see them going through Catalina, and there's nothing that gets down to Oro Valley. So, we have a very efficient, natural system for it.

We need to look at some of these bigger tributary washes and see how we can do things to either help recharge or - probably is our best thing to collect enough stormwater to re- - to put it to good reuse. The Kino Environmental Restoration Project, which was redone - re-engineering if you will, in the built environment of the Old Ajo Detention Basin, which was just a big ugly hole in the ground.

We - we in the late 1990s, early 2000s with the Corps of Engineers and Wastewater, reconfigured this detention basin so it's stormwater harvesting; it's an environmental restoration program; and we use both - stormwater both for the environmental restoration, as well as some of the ball fields that are out there; it was one of our first big projects to do it. We - there's been a lot of learning curve, but it showed that you can, on large regional detention basins, collect and reuse stormwater. And we did, in fact, successfully apply for surface water rights to be able to do that.

The other thing might be something like the Arroyo Chico Project for the downstream that we're working with - with the City and the Corps of Engineers and just rebuilt Cherry Field; again, that took some existing land use, sunk it so it would retain water.

If we can take someplace like Arroyo Chico where the water from a heavy, heavy summer storm flows out in one hour and make it something that it flows slowly out over 30 hours into the

Santa Cruz River, you've really enhanced the ability for the Santa Cruz River to recharge that - that stormwater instead of it just being a flash flood.

We need to better quantify and define economic benefits like, say, things need to be where it's cost-effective; it needs to be where if I can quantify the water harvesting and the reduction in stormwater runoff, and then tell the developer if you build this kind of water harvesting feature, then I will let you build less - a smaller detention basin, or put in less infrastructure, then we have something that's cost-effective. If I have a flood control problem and people are - an undersized stormwater and I can incorporate in stormwater harvesting into that program, it makes it all more cost-effective.

We really need to - there are some legal frameworks and some legal constraints that we need some - some assistance with. Some, through ADQ, getting the tri-annual review to recognize that you might need to blend stormwater and reclaimed water and use them in environmental restoration projects and not put in the condition that, oh, it's got chlorine in the reclaimed water and you're putting it into the stormwater. You're going to have to remove the chlorine. Very costly. Very costly to monitor. So, we need to make some changes to that.

There's not one simple answer. I wish we could say that all the stormwater, rainwater, we can collect it all and use it. We can certainly improve our efficiency. We need to be looking at both the small scale, what a homeowner can do, what we can do on small developments. We also need to be looking at the larger scale.

And I'll just open it up for questions.

CHAIRMAN MARCELINO FLORES: Before we get into questions, Suzanne, can I ask Staff to be introduced -

SUZANNE SHIELDS: Oh, I'm sorry.

CHAIRMAN MARCELINO FLORES: - either you can introduce them or they can introduce themselves and their role in this study.

SUZANNE SHIELDS: Okay. Bill Zimmerman over here works for me in - he's the Division Manager for Planning and Development. Evan Canfield is the Chief Hydrologist that works for

Bill; he's been the one that's been working on some of the quan- - trying to quantify what might be good practices for stormwater harvesting, techniques, better ways to build things.

SANDY ELDER: I'm Sandy Elder, Tucson Water. This is Ralph Maher (ph.) our Team Hydrologist, Leslie Liberti, introduced earlier.

CHAIRMAN MARCELINO FLORES: All right. Thank you. Mark?

MARK STRATTON: Yeah, Suzanne, in your report you - I thought you did a pretty good job of identifying on - on the much smaller-scale opportunities there, but knowing that in the inner-city area where everything is developed, you know, the Cherry Field and Arroyo Chico and so forth were exceptions to the rule, you might say, because you've had infrastructure that could be used, has the department - I mean the district - looked at further upstream to capture or slow down some of those flows before they get to the urban areas so that the urban flows don't have magnified impact when those flood waters do come to allow a little bit more even flow throughout the channels?

SUZANNE SHIELDS: Well, each watershed - tributary watershed's a little different. We do have upstream detention basins on, say, Julian Wash, the Kolb Road detention basin, the Rita Ranch detention basin. Rodeo Wash has a detention basin on it. We were just finishing construction on a Mission View detention basin there at Park and Thirty-Sixth Street that would take - collect the water.

It's hard to do some of these upstream detention basins where you already have existing homes. You do have to look at an opportunity where there's either a large development coming in, or something like this, a large open area.

Where - would there be more opportunities is had people thought about detention basins more in the future - John asked me this - yes, I'm a native of Tucson - so it used to be they just put everything on the street and just let it - let it rip. As - as we develop, as - develop to the south, development in the southwest area, we need to incorporate regional detention basins as one of the features so that you just don't rely on the traditional storm-drain-type systems.

MARK STRATTON: Yeah, I guess I'm talking even further upstream where there is no development so normal stormwater flows that are coming that have not even reached the urban area yet, you know, where the County has a lot of land or even State land that's adjacent to some of the washes,

can diversions be done there to slow it down on massive stormwater flows, so that by the time it does reach the urban area you don't have such large flow volumes coming through that also are compounded by the flow volumes from the urban area?

SUZANNE SHIELDS: At different times people have tried to look at - see if there was a possibility to, say, do an upstream dam on the Santa Cruz River and, let's say, in the Canoa area, or there is even the infamous Golder Ranch dam that was on the Canada Del Oro. What we've seen - and the Golder Ranch dam was a good example of it - is the -

MARK STRATTON: Or bad example.

SUZANNE SHIELDS: - the geology - or bad example - the geology was such it - it had to be breached because it is so fractured that it - it did not have the kind of stability, structural underground stability for a dam.

So, it would have to be a real tradeoff, I mean, where we could put upstream - I don't know that anybody really wants to have an upstream dam on, say, the - Sabino Canyon, something like that. I wouldn't want to be one that suggests it. They've looked at it and for various . . .

MARK STRATTON: When you do Snyder Road Crossing you could put the dam right there and no one - no one will (inaudible; speaking over one another).

SUZANNE SHIELDS: - but, seriously, for - for physics -

MARK STRATTON: Yeah, they won't even notice.

SUZANNE SHIELDS: - for physical reasons, it - it's very difficult because of the geology and it's really challenging, too, because a lot of these areas you go from, you know, 25% slope, then all of a sudden it changes to - to nothing.

Had we - in 2006, we had the debris flows. Well, you can imagine what that would do behind some kind of a small check dam. So, it's been - was looked at in - in the '70s, the way of putting out upstream dams, but it wasn't viable then primarily because of our geology.

CHAIRMAN MARCELINO FLORES: Bruce and then Vince. But, before - if there's comments on Mark's comments, I think I want to hear that.

I - I actually had a thought. As Mark had mentioned, you had mentioned the State lands and - and, perhaps, using detention basins with State lands. I was just - I know that the State Land Department, I believe, hold - or are obligated to really look at the maximum, you know, bang for their buck in that instance as well as part of their trust process, and I don't know how well detention basins fair versus, you know, development or some other uses, so I don't know if anyone had any other comments on that, but . . . no?

So, Bruce?

BRUCE GUNGLE: I - I actually have two. The first is real quick. I was unaware of - of the street side - I'm not even sure what you call 'em - the little things on Ninth Street in Rincon Heights, you know, that capture the street flow. I'd seen a few closer to campus - I work over on the southwest corner of campus - and there are a few over in there and we knew that they were for capturing water, but I didn't quite understand the bigger picture, and so on the way back today I drove down Ninth Street, and it was kinda cool to see them in action, you know, half of 'em were filled with water and so on. So, that's kind of interesting in how that also dovetails with the traffic (inaudible) device as well; I mean, it's a - it's I think a good solution to some of these issues and you all are to be commended for that work; it's impressive.

The second thing is I'm familiar with a study that (inaudible) from the USGS study - it was published in '05 - it's on the Sierra Vista sub-watershed and it was a study of recharge in the sub-watershed, and in that they estimated that about 20% of the recharge in the Sierra Vista sub-watershed was coming in the ephemeral channels.

And I noticed in this paper that you discuss that the tributary streams weren't good for infiltration, and I was wondering what the difference was. Is it because these are engineered detention basins that spread out wider than, you know, a channel with alluvium, at least over the first few feet of depth, or is it - is it just the differences between the two basins overall or something else?

SUZANNE SHIELDS: Well, some of this - and I think Tucson Water might be able to answer this a little better - is based on some studies done by the USGS using tracers to figure out exactly where -

BRUCE GUNGLE: Right.

SUZANNE SHIELDS: - where recharge was occurring. And I should correct it, when we were saying "tributaries," we were talking about the valley in - in - central Tucson. Certainly, tributaries along the foothills, in the mountains, and in some other areas of eastern Pima County do do recharge, but they found to the central areas, say like in here, because the caliche layer is so thick, that they weren't - weren't seeing the recharge. But, you know, clearly, for example, Pima Wash is a pretty big wash, and most of the time you will - at different times you can see it flowing up, say, the Ina Road area. The USGS has for years stream-gauged down by Pima Wash and River Road and it never, ever got any flow. I don't know that it's ever flowed. Or someplace like Finger Rock Wash that, you know, in the last 30 years it's flowed only twice down to the river. So, certainly, tributaries like that are a good source of infiltration.

BRUCE GUNGLE: So, it's out on the basin floor that you're -

SUZANNE SHIELDS: Yes.

BRUCE GUNGLE: - talking about specifically?

EVAN CANFIELD: And I think we're tried to make that distinction. I'm not - you know, I know that that became apparent when we're talking about the Arroyo Chico, we're talking about something different than -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - than Sabino Canyon or - or, you know, Pima Wash -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - Pantano Canyon.

BRUCE GUNGLE: Oh, go ahead.

EVAN CANFIELD: Oh, Ralph was - Ralph, did you have any comment on the . . .?

RALPH MAHER: Right. When you were talking about the amount of recharge that you see in the tributary washes in the basin floor, a lot of the thinking surrounding that goes to some of the isotope water quality sampling that's been done in the basin. And what they find is that along your major watercourses - and it's kind of expected really - that, you know, when you're looking at tritium and so on,

this is basically an indicator of new water, fresh water, recent water, that you see an abundance of it along your major stream channels and stream courses. But, when you go along some of the tributary washes on the basin floor and so on, the magnitude of tritium you see is so much less that people came to the conclusion that the tributary washes contributed fairly little to the total amount of recharge that occurs.

BRUCE GUNGLER: And that sort of dovetails with - with what Mark was talking about before; if we could capture some of the flow before it gets to the basin floor, well then you're going to have more infiltration if that were possible.

CHAIRMAN MARCELINO FLORES: Vince -

VINCE VASQUEZ: My question is -

CHAIRMAN MARCELINO FLORES: - and then John.

VINCE VASQUEZ: - and I know every landscape architect and planner, and that includes me to some degree, is kind of in love with the idea of low-impact development or decentralized stormwater control, and I wondered if - if some of you might comment on some of the concerns that you might have with that, you know, the long-term functioning of these decentralized systems, the maintenance, the reliability of them as a truly functioning stormwater management control; these kind of on-lot systems - are they really going to be able to handle our - the majority of our - our stormwater issues, or how much do we really still need to be relying on more regional solutions to our stormwater management, and that these are kind of - these are nice supplementary things to help kind of attenuate peak flows or . . .?

EVAN CANFIELD: Okay. Yeah, basically there's - you know, it's asked about supplemental water, you know, if you're - if you're - if you own the lot and you would like the supplemental water, it's there.

If you're saying stormwater control, you know, we're trying to make the point that there's a lot of different benefits to water harvesting, and one of which is stormwater flood control or water quality, stormwater control, and I think you still have to rely on some sort of, you know, central - either the HOA or covenants that tie people into maintenance, and we currently have that with detention

basins as people are supposed to go out and maintain those. So, I don't think you get away from that. I think you can't.

BILL ZIMMERMAN: I'd - I'd just say it can reduce the size - as Suzanne said - of the basin, but you're still - the basin needs to be somewhere that is pub- - you know, maintained by the HOA or in a public right-of-way so we know it gets maintenance.

CHAIRMAN MARCELINO FLORES: John and then Tina.

JOHN CARLSON: Probably more statements than questions. You know, when you mentioned about 3,000 second feet coming in here and 300 going out, or just what your figure were (sic), you got to be very time sensitive of that. And my perfect example of that, Fulsome Dam east of Sacramento was - under normal conditions was going to take seven years to fill, and in Christmas of '55 it filled up in two nights and saved the city of Sacramento. I was up there and the whole damn area was shaking and everything else. So, when you - and I realize the designers have these things in mind.

I live in a neighborhood, were you own one foot outside of your building line and everything else belongs to the association, and we have some drainage ditches and the one to the east of us there's a - there's a - oh, 40 feet wide and I notice they've built two little retaining basins with a slotted out that - that I haven't - I've only seen over - in six years overflow twice, and - and what we look for - of course, we don't like the water rushing on our streets, it - it wrecks the street and leaves a lot of gravel around - but I've encouraged little rock, semi-dams to drop the debris in and we have to clean 'em out and everything - but I notice that there's - there's in highway construction, especially with your cloverleaves, there's a hell of a lot of room for - for detention. And I'm just saying there's a need here for coordination between local law, County law and State law and I - I don't know if you want to comment on that.

And just a trivia thing, I stumbled onto it a couple months ago. Utah and Colorado, you cannot catch the water off your roof and use it for - for local use. You've got to let it go into the Colorado River, which is good for us and I know we're not considering it, but I'll just leave it there.

CHAIRMAN MARCELINO FLORES: Okay. Were there comments by Staff or the Committee members? Tina?

JOHN CARLSON: In other words - excuse me - are you going to encourage neighborhoods to do what I just tried to describe to you? What kind of a program do you have? Sure, new ones, but how about educating the old ones and getting them to do some of these things?

SUZANNE SHIELDS: Some of it will be trying to educate them and giving them - and showing demonstration projects. And the one along Ninth Street that - Rincon Heights - that was actually done with the City through what's your neighborhood redevelopment or . . .

EVAN CANFIELD: (Inaudible; not speaking into a microphone.)

SUZANNE SHIELDS: Oh, it was (inaudible) funded? Okay.

But I think we need to just come up with some new ideas and then - then explain it to people. I mean, it's just like explaining water harvesting, you - you need to tell people: Okay. If you're collecting it from your roof, what can you use it for? Because if it hasn't rained in four months, the water coming off your roof is not that great for food vegetables, let's put it that way.

But, we - we probably need to come up with some kind of education program so that we can tell people what - what is possible and so that they could see what you could do. Some of it might be site-specific, but I think there is opportunities in the built environment to come up with small projects that, you know, help - help get some of the water off the streets, but it - it is - it's more of an education because it's got to be a group of people that are dedicated to it and want to get it - get it done. It sounds like your homeowners' group wants to do it.

JOHN CARLSON: Yeah, and they had me who'd had a little experience, so what the hell. But, I think you ought to produce a little paper and give it to the homeowners' associations around town.

CHAIRMAN MARCELINO FLORES: Tina?

TINA LEE: Okay. If there's ever been a poster child for regional cooperation on water issues, it's stormwater, 'cause everybody can see it; it hits everybody and it runs altogether and eventually goes down the water - the washes and stuff.

And it seems like - and this is not a new thought, in fact, it goes back to the old TSMS studies early on - but was there any consideration given to bringing up the concept of a stormwater utility

for cooperative management, coordinated sort of entity that would look at stormwater management in the region, rather than these sort of, you know, local smaller fixes?

And just hearing some of the questions, too, about you've got these distributed stormwater sort of mini solutions of local basins, et cetera, but the need for a more regional approach, perhaps, to coordinating some of those localized solutions would be valuable, at least to maybe bring the discussion up at this time again.

SUZANNE SHIELDS: There - under State law you can form a stormwater utility; the Town of Oro Valley has one. Flagstaff is trying to have one and they've been taken to court and we'll see if that - there's - I guess there's some legal issues in doing that. We - all the different jurisdictions, we do try to - to cooperate with it. Stormwater is there's stormwater quality issues and every - as a jurisdiction you have your own separate stormwater permit from ADQ.

So, some of these issues they're so closely tied to land use, they're - they're so that each individual jurisdiction wants to be able to approach it their own way. And - and there's not - nothing wrong with that either because, in fact, different areas - Pima - unincorporated Pima County, we have to address them in different ways. So, I don't know if there - there is ever going to be where everybody comes together and says this is what we're going to do with stormwater. On the major rivers it's a little bit more focused, but - but even then it's - it's still very much individual by the jurisdiction, or whoever owns the river, because most people don't realize that it's not just water rights, but the rivers are not - are not publicly owned. So, what you can do in one place you might not be able to do in another place.

CHAIRMAN MARCELINO FLORES: Bruce and then Vince, or

...

BRUCE GUNGLER: I have just a couple comments about some of the figures towards the end, 11, 12 and 13. Now, I realize that I may not be the brightest guy at the table here, but I found the figure captions on these three to be a little bit opaque; maybe I'm just missing it on two of them.

On Figure 12, I understand what's going on, the "ET" refers to the evapo-transpiration from the mesquite, but probably to the lay person that's not going to be obvious, so I recommend re- - revising that somehow to make that a little bit clearer.

On Figure 11, I'm actually pretty clueless as to what "developed" and "undeveloped" refers to -

EVAN CANFIELD: Okay.

BRUCE GUNGLE: - and I - I know I moved through the text here pretty fast, so I might've missed it but . . .

EVAN CANFIELD: Okay. Those two curves, the red and the green curve -

BRUCE GUNGLE: Mine are - mine are light gray and dark gray.

CHAIRMAN MARCELINO FLORES: And, in this light, I think they're . . .

EVAN CANFIELD: In the top one - that's part of it, yeah - if you go to the - Figure 1 way back at the beginning -

BRUCE GUNGLE: Right at the beginning of the paper you mean?

EVAN CANFIELD: Yeah. Okay.

BRUCE GUNGLE: Okay.

EVAN CANFIELD: It's got that "harvestable stormwater versus area" and it talks about the different scales that we use in this paper: lot scale -

BRUCE GUNGLE: Uh-huh.

EVAN CANFIELD: - neighborhood scale -

BRUCE GUNGLE: Sure.

EVAN CANFIELD: - tributary water. Okay. Basically, it's just - the green and the red - or the dashed and the - and the solid in your case -

BRUCE GUNGLE: Okay.

EVAN CANFIELD: - upper and lower -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - those are the ones that we - I - we continued onto this -

BRUCE GUNGLE: I see.

EVAN CANFIELD: - this next page just to simply show you that, you know, some simple BMPs, you know, a lot side water harvesting, based on our model, could have a significant impact in the total volume of water that is - that comes off the lot, you know -

BRUCE GUNGLE: Okay.

EVAN CANFIELD: - that there is storage in that.

Now, you know, also further to clarify - I mean, if you had a big - big event, most of it's going to go away; this is - this is for - this -

BRUCE GUNGLE: Yeah -

EVAN CANFIELD: - is like -

BRUCE GUNGLE: - it's going to flow - a lot of swill in size.

EVAN CANFIELD: Yeah, you know, you got a quarter inch flow, you may be able to keep it all on your lot -

BRUCE GUNGLE: Yeah. Right.

EVAN CANFIELD: - you know, got a half inch, you might be able to keep - and if you think - you know, most of your - you know, today we got, you know, around here about a half inch rainfall.

BRUCE GUNGLE: Right.

EVAN CANFIELD: You catch half of that, you know, you know, a quarter inch off of every one of 30 rainfalls a year and it's a lot of water -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - it's . . .

BRUCE GUNGLE: Anyway, you probably - in your figure caption you probably want to reference that figure -

EVAN CANFIELD: Okay.

BRUCE GUNGLE: - so people can keep track of what's going on.

And then how about in that - the third one that I mentioned, Figure 13?

EVAN CANFIELD: Okay. Yes, that one we have this - you know, there's 105 years of daily rainfall data from - from the U of A.

BRUCE GUNGLE: Right, right. I remember that -

EVAN CANFIELD: So, essentially -

BRUCE GUNGLE: - from the text.

EVAN CANFIELD: - you got 36,000 days of - and you can do a mass balance where you say, okay, what's the amount in the soil? Depends - the amount of storage in the soil depends on whether it rained yesterday and whether the plant took up - and how much the plant took up -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - today; and, of course, in the - in the summer it's taking out more and the winter less.

BRUCE GUNGLE: Right.

EVAN CANFIELD: So, essentially, that's all it is; it's just - it's a mass balance. And so if you looked at it on an annual basis with this little one-fifth acre lot, you know, about 400 to 600 cubic feet, or four to six CCF a year is sort of your - your - your median amount of harvestable - harvested rain that you'd get from -

BRUCE GUNGLE: Right.

EVAN CANFIELD: - those basins. So, that's a - that's a way to quantify it and tie it back to your water bills, you know, the idea is to supplemental water; right? You're getting CCF in your water bills, you can convert this to CCF and you can quantify and talk about it in terms of water use. And, of course, every year is going to be different -

BRUCE GUNGLE: All right. I think I see what's happening with that.

EVAN CANFIELD: And every year, of course, is going to be different depending on, you know, how much rain you had and how hot it was and . . .

BRUCE GUNGLE: Yeah. Right. Okay. Well, thanks - thanks for that. I don't know if everybody else got these or not, but I just think the captions could be improved a little bit to help - help out the reader.

CHAIRMAN MARCELINO FLORES: We have about ten minutes. Vince?

VINCE VASQUEZ: One of my questions gets into kind of the concept of matching water quality or water type with the appropriate use, and in looking at how we can use our stormwater better for our riparian restoration efforts instead of maybe using so much effluent or so much proposed effluent. For one, it seems like the stormwater is already there, we don't have to move it - we don't have to move it to the riparian areas oftentimes and it - I don't know if it's an issue of appropriation if you're - the concept I had in my head when we're - when we're kinda talking through this is kind of an in-channel - an in-channel recharge for environmental purposes or just outside the - the whatever - wherever the cut channel is to be able to syphon off some portion of it to feed these kind of environmental restoration projects that - that could more align the - the major channels which could be part of, you know, flood acquisition program purchases within the - the buffer of - of the - the stream. Is that - is that something that's actively considered or possible?

I know that there are issues in terms of trying to sequester that water for municipal purposes and trying to gain stormwater or recharge credits for that because of various statutes, but it seems like it'd be a way to then - instead of try to do it for municipal purposes, you could relieve that demand for environmental restoration for water that's better used in municipal purposes like effluent.

SUZANNE SHIELDS: For the Kino Environmental Restoration Project, if we were not trying to also water ballfields, we wouldn't need to use reclaimed water at all, okay? And it's mixing up the two that creates the - the legal water quality issues. So, that project, which includes open water, so it'd be - with the highest use of water for environmental restoration, it could be supported completely by stormwater.

We have just finished constructing what's called "Swan Wetlands," and even though it still - the first five years is when you're probably using the most water, we've learned some techniques about how to do stormwater harvesting - and we're harvesting just on the footprint of this - this development - and how to - how to dig the hole for the tree or the vegetation, so you don't just dig container size, you have to dig it out a lot so that you actually create storage.

So, we're getting to be pretty efficient, much more efficient than you might expect using stormwater harvesting; and that would be our goal is that we have to use reclaimed water, it's used for a short period of time for establishment - maybe under extreme drought conditions - but it's primarily stormwater that's handled.

We were asked to do three papers, and one was stormwater; one was one that we'll be discussing next, the riparian on shallow ground- - groundwater; and the third paper is for August when we're going to talk about water for the environment, and we're going to get into that; it's a lot more complex and so we couldn't get it done and needed some time to look at some different things, but in - in that paper we will present and talk about how - how to use harvested stormwater for - for the environmental restorations in the environment.

JOHN CARLSON: But in the conclusion you have, you'd like to do it if you had - but you need more money to do it; right?

SUZANNE SHIELDS: What?

JOHN CARLSON: You'd like to be doing more of this type of thing -

SUZANNE SHIELDS: Oh, yeah, I mean a lot of it's funding.

JOHN CARLSON: - it's just a question of money.

VINCE VASQUEZ: Do you get into like 404 issues and all that with - with going in and trying to - to create essentially recharge basins within the floodplain? Is that - I mean . . .

SUZANNE SHIELDS: Swan Wetlands we specifically did not go down into the ordinary high water mark, okay? So we did not have a 404 permit issue there. But there are a lot of environmental issues, so if you stay up on the over-bank, you're - you're okay.

VINCE VASQUEZ: It just seems like - I mean, sorry to keep talking this out, but I'm not a hydrologist - but it seems like these floodplains they're - they historically behave in such a way that they were able to kinda spread out and - and that you could, essentially, recreate that by having these - these places where you could syphon some of this stormwater off into the - if you have to stay out of the floodplain because of 404 issues or out of the - the - what'd you call it? The - the normal high-water

mark? But, it would still - it would help it - it would help that system along that - that - that drainage to function as it historically or is designed to do, so . . . I'll wait till - I'll wait till August I guess.

CHAIRMAN MARCELINO FLORES: Okay. Rob?

ROB KULAKOFSKY: Along those lines on page 27 you talk about how channelized washes or in-sized watercourses really chewed out a lot of water and they - there's no recharge in those. And along what Vince was talking about, I was thinking there's some way to - and now you're talking 404 - to reconfigure some of those so that you can maximize recharge, do some environmental restoration, and also get some of these watercourses back to a more natural state, 'cause many of them were not in-sized like they are now, historically. So, it's just one of those things that I think would be a wonderful thing to do; it may be difficult, but I think it should definitely be in our toolbox. We'd get a lot of things done.

CHAIRMAN MARCELINO FLORES: I'm just curious on that comment. Is the Santa Cruz portion south of Irvington kind of an example of going back to more historical or . . .

SUZANNE SHIELDS: Yes, we work with the Corps of Engineers - now that was done by a private developer - but they used the concepts we'd put together for - essentially from Silverlake to Los Reales where you minimized the - any kind of structural and you created a low-flow area, and then where the water could pond up in the floodplain area.

CHAIRMAN MARCELINO FLORES: Okay. We're - we're just about at the time limit. I actually wanted to point out a gap that I perceived as well; I think it was mentioned some - some caps had existed. But I've heard that for every mile of road, there's two miles of drainage and so I think maybe there could be a connection to roadway projects and, you know, better designed or integrated drainage improvements.

The other thing I wanted to point out is that I was in receipt of a stormwater capture and reuse study, Phase 1, by the Bureau of Reclamation. I don't know if - I - I haven't reviewed it myself, but I understand that they have evaluated stormwater cistern systems and - or various systems for their technical, I guess, applicability and - and their - their cost-effectiveness. I understand there's three

examples or - at a scale for like a big box example or system, a neighborhood system, and then kind of comparing what the cost break or fee is, so I don't know if that's within your arsenal.

I don't know. Any response or comments from that quickly from the audience if there were any comments.

BILL ZIMMERMAN: I got one response for you on that. We are now - for whatever reason we went away from doing detention behind roadways in the '80s and '90s. We are going back to doing some of that.

CHAIRMAN MARCELINO FLORES: Okay.

JOHN CARLSON: I didn't quite hear that. You say you used to -

BILL ZIMMERMAN: Yes.

JOHN CARLSON: - and you quit it and now you're going to start again -

BILL ZIMMERMAN: Yeah.

JOHN CARLSON: - using a road berm as a detention device? Good.

SUZANNE SHIELDS: I'm not quite sure why some of these things stopped. When we were building a lot of Palo Verde, Kolb Road, Valencia to DM, Valencia, that's when Kolb Road Detention Basin, the Rodeo Wash Detention Basins and some of these other basins were built concurrently, as it's more cost-effective. We could use the dirt as part of the roadway projects and it reduced the size of the . . . drainage structures required for projects so you know . . . sometimes something falls out of favor and then they decide that that was a good idea to do.

CHAIRMAN MARCELINO FLORES: And then also there's some BPMs in drainage structures within roadway systems if that's correct, like the median is kind of - how do you say? It's little bowl shaped or whatever, but - Nancy?

NANCY FREEMAN: Thank you. Nancy Freeman, Groundwater Awareness League. I just want to quickly mention that people bring up this surface water rights, but they never mention that if you don't use your surface water rights over a certain period of time - I've heard it's ten years - then you lose 'em. So no one's been using any surface water rights in the Santa Cruz in the last ten years.

I want to question the - Flood Control when they are going to stop permitting new development in Pima County in sheet floodplains without any stormwater management facilities, and absolutely no study or concerns for impacts downstream, and also the permitting of roads. For example, in Davidson Canyon without any impact, hydrological impact as far as flooding at all. And I was going to mention the Sahuarita Highlands and the San Pedro Estates and the Tierra Linda Nueva Subdivisions all permitted after 2002 in sheet floodplains and Tierra Linda Nueva has a corner of FEMA on it and absolutely no stormwater management facility whatsoever and it's - it is definitely causing some problems.

WILLIAM CROSBY: As we move from a drought situation into a permanent drought climate change here in Tucson, I don't really expect to see any '83 or '93 extraordinary events maybe again. And two years ago we had no flood in the Tanque Verde Wash. I'm told this is a normal condition by hydrologists.

So, what happens to surface water rights and surface water at that point when it's no longer surface water? And I think we should address this in this effort because I think that's a condition we're going to definitely see.

I'm also concerned about the build-up of deadwood in the washes around Tucson, which then become either fuel or - to the point where they change - because of the abundance and flooding, they change the course of the rivers and the washes.

We also need some benchmarks, and I should hope that this Committee can establish the water needs for this population at this time so that we have something to go on. Perhaps, the City and the County can establish what their acre-foot needs are per year. I would ask for that.

JOHN CARLSON: Yeah, on that point of who - who owns the water, you - and you say "surface water" - the flowing subsurface water is considered surface water for - for ownership, and it came up with us with the sewage discharge out at Roger and how much is going to the next county up there just beneath the surface; it looks like it's dry but there's so much below, so it's a very technical thing. You got to watch it.

CHAIRMAN MARCELINO FLORES: And I'd like to gauge, yeah, what some of the thoughts are in a bifurcated system and whether we should integrate it, but . . . you had a comment?

RALPH MAHER: In response to Mr. Crosby, the first comment he made regarding climate change and - and how there'd be less surface water or no surface water and so on. When people talk about climate change and look into the future, they're not saying there's isn't going to be surface water, there isn't going to be rain, they're not saying anything like that. And what they tend to be saying is there could be a greater intensification, and what that means is that you might have maybe fewer storms, but some of those storms could be really big ones, and that when you see flows in the river maybe - there might be maybe lower frequency of flows in the river, but there's a chance that you're going to be seeing flows that might be really big ones.

So - so, when there's a lot of climate change discussion, it doesn't mean that there isn't going to be surface water anymore; it's just - it's going to be changing the nature of it, the frequency of it, and maybe even the magnitudes of it, so . . .

CHAIRMAN MARCELINO FLORES: Well, let's give a round of applause and kinda shake us up a little bit.

(Applause.)

CHAIRMAN MARCELINO FLORES: Suzanne, will you be introducing a new panel or will the same panel lead us into the riparian . . .

SUZANNE SHIELDS: Same from the City, I'm going to ask Frank Postillion to come up. On this - on this third paper - well, third tonight, second in - in the run with Flood Control, we were asked to explore opportunities for protecting the environmentally-sensitive natural riparian areas in Pima County, especially those that are connected with shallow groundwater. And some of what we tried to do in this paper - because in simple sentence, but very complex as far as the underground hydrology that - that - and geology that create these kind of shallow groundwater systems - we tried to explain to people what they are, how they work and, even more importantly, when we say sometimes that we might want to use reclaimed water, effluent to help sustain these, we do not mean that we would be irrigating the riparian areas. Instead, it was - the best example we had was the Forty Niner's golf course where - get an

extension of reclaimed water line and so it's in the Tanque Verde valley and, instead of using groundwater for the - for their golf course, they're using reclaimed water instead. And that's - that's kind of a tradeoff, if you will, when we're talking about the shallow groundwater systems.

The other thing that is critical, and we're trying to - we're studying these more than we have in the past. PAG has done two studies for us; one in the '90s, and they just finished one up for us for - for the - mid-2000 where we're looking at water levels in wells, as well as the number of, if you will, production wells; it might be for utility versus exempt wells, which are the wells that somebody goes out and buys their five-acre lot and sinks a well for their home to water (sic).

These are snapshots of what's going on with water and it's very much the shallow water systems - even if there was no wells in the area, you would see fluctuation from natural occurrences. The drought, obviously, is one, not only is the drought - less water coming into the system, but the vegetation itself is pulling out more water, higher evaporation rates.

One of the key things, especially say in Sabino Canyon, Tanque Verde, areas like that, is the seasonality. When we're having a drought - I mentioned this before - it's the winter rains quite often that - that we lose. I've had a number of surprised people calling us up in the Sabino Canyon type of area, up in the eastern part of the - Agua Caliente and others where suddenly water is flowing somewhere, and what these are, are just natural springs. This last winter we've had snowstorms, some fairly good ones, and so when it melts, and it melts more slowly, you get these springs. They've always been there; it's just sometimes they're drier.

So, when we're looking at these water levels, it's important to note that we can't always distinguish natural from manmade functions. But, we were trying to come up with some - descriptive of where we have them. Clearly, there's some like in Arivaca that have nothing to do with - with the regional study here, but there are some, like Sabino, Tanque Verde and Cienega Creek that are, in fact, or could be impacted by wells, whether they're exempt or other wells.

So, our suggestions were: One is to continue to financially support acquisition of land and water rights near these ecosystems. You can buy land, but that doesn't mean you get the water rights,

whether surface or groundwater or - so it's important that we also acquire the water rights along these ecosystem areas.

We need to look at ways to protect and enhance Cienega Creek, Rincon Creek and Canoa, and it may or may not include purchase of water or extending water - reclaimed water lines.

We need to relook at the effectiveness of our different programs and policies in water service areas to see how we can protect these environmentally-sensitive areas. For example, the Pima County's water - more recent water policy would look at new development, say, in the '80s, '70s or '80s, '60s, '70s, '80s, even '90s. New development comes in, the easiest thing for - for water service is sink a new well. Well, if development is going to occur in these areas, we need to determine if there's an impact.

These two - and they somewhat go together - is that there needs to be some change on State rules and laws . . . requiring some more review of impact from - from pumping, especially when it occurs from mines. Mines have a huge impact on water levels. We're talking about municipal water use, municipal conservation; with mining, it's another thing altogether.

Where possible, we need to be able to control where wells are. We recognize, though, that we have no legal - neither the City or the County - mechanism to prohibit these non-exempt wells; we can't control them; we can't even control the wildcat subdivisions that make them occur; but, perhaps, look - look for some State law.

We can look at new wells for development. One - and this was more of a suggestion - was to look where different water companies could, perhaps, share some of their - their infrastructure, whether that be like distribution system to be able to potentially wield in renewable water and - I'll tip my hat to Mark - it wasn't fair for us to just name Hub Water Company and Tucson Water, Metro, because there's other areas - what - that if there was some sharing of resources, then it'd have to be looked at. There could be both cost savings, as well as protection.

Need to make people more aware - especially exempt well owners - of the sensitivity of the shallow groundwater. Quite often we will find - 'cause we do do outreaches to these riparian areas - that somebody is pumping their wells a lot so that they can water their vegetation and they don't see the

disconnect between what they're doing and - and the protection of the vegetation, which is why they bought their properties.

We need to support, in general, collection of data in these areas, monitoring the aquifer, and trying to see what is - what is causing in some areas the water table to go up, in some areas the water table to go down as we get into drought scenarios or things like that; some of these areas are very sensitive; they're very complex geologically underground how these systems work, usually there's a fault so, you know, somebody might say, ah, the well is real close to the - to the shallow groundwater, but it's on the other side of - of that fault and pumping that well has nothing to do with the - the shallow aquifer, and then - then there's something that would be happening, though, that could have an impact and we need to better understand these things, and the best way to do that is through monitoring.

As I said, we were trying to focus this only on the shallow groundwater dependent ecosystems. We wanted to wait and look at things, including the effluent-dominated streams and water for the environment in a - in a second paper. I'm hoping we'll be able to distill all that information down into something that's short and coherent. But this - this is our recommendations for these fairly unique areas that we have in Pima County where shallow groundwater is sustaining a very unique ecosystem.

CHAIRMAN MARCELINO FLORES: Okay. Comments starting with Mark.

MARK STRATTON: As you probably can gather, Suzanne and I had a few comments beforehand about some of the language in the report regarding the Metro/Hub area, but just to give a perspective of what really happening there, my Staff had looked at the pumpage within Sabino Creek/Tanque Verde area where we are, including municipal pumpage that Tucson Water was doing. There's actually the capability of more pumpage by exempt wells in that region than what we do as a municipal provider, which is unbelievable if you think of that because each of those wells is serving probably one or two properties, but there are so many exempt wells in that region that it puts the municipal pumpage to shame.

And going back to your comment on exempt-well legislation. Southern Arizona water users a couple years ago put forth legislation to limit exempt well - new exempt wells from being drilled,

and as you can probably gather with our legislature and property rights issues from the conservative side, it was a very difficult and uphill battle.

We were able to get kind of a compromise where no new exempt wells are allowed in an area where there is a designated water provider; that was a huge win for the municipal providers in this region.

That being said, there's still a lot of non-designated water providers throughout the region, so there's still a lot of exempt wells that can still be drilled. But, I think until there's some way that exempt wells can be limited at a more local level, it's going to be difficult to continue to look at protection of the riparian areas, because there really is very little regulatory oversight of those exempt wells, and I think that is a critical issue that needs to be emphasized in - in this report of yours.

CHAIRMAN MARCELINO FLORES: Okay. Any comments on Mark's comments?
From . . .

BRUCE GUNGLE: I've got a quick follow-up question. On page five, you got the - on the report you document the withdrawal of non-exempt wells. I was wondering how - how you guys went about calculating the exempt well withdrawals; just use an average use and number of wells?

FRANK POSTILLION: Yes, that was based on an PAG report that - and PAG went to ADWR -

BRUCE GUNGLE: ADWR.

FRANK POSTILLION: - and ADWR gave an estimate of about one-acre foot per - per well per year.

MARK STRATTON: Could I ask a question? You talk about a number of service water diversions. I know the one at Cienega Creek in Vail, but where are some of the other service water diversions in the region?

FRANK POSTILLION: The primary one is at Cienega Creek; that's -

MARK STRATTON: Right.

FRANK POSTILLION: - about 400-acre feet a year that goes to a golf course down in - the Vail golf course or Del Lago I think it's called.

As far as the other diversions, I'm unaware of any other major diversions. There are some effluent diversions further downstream. There's an effluent diversion at Marana High Plains that for - both Marana High Plains and a local rancher that diverts water - and that's a surface water right for the rancher.

MARK STRATTON: But, as far as stream flow, the only surface water diversion structure is really the Cienega Creek? I'm just clarifying -

SUZANNE SHIELDS: Yes.

MARK STRATTON: All right. I understand on the effluent there's two diversions.

SUZANNE SHIELDS: Yes.

MARK STRATTON: Okay. And that's 480-acre feet a year? Is that how much -

FRANK POSTILLION: Last year it was 400 - 2006, it was 403 acre-feet.

JOHN CARLSON: Marc- . . .

VINCE VASQUEZ: (Inaudible; not speaking into a microphone) pump water. They're recharging surface water (inaudible).

FRANK POSTILLION: No, they have a diversion at the dam itself and it - it is actually a pipeline, a gravity-feed pipeline that flows about two miles down to a pond, and there at the pond they divert the water, they pump the water basically for use.

JOHN CARLSON: That Cienega Creek example you - that Cienega Creek example that you had?

SUZANNE SHIELDS: Yes.

JOHN CARLSON: Yeah. Marcelino, I have questions.

CHAIRMAN MARCELINO FLORES: Yes, Bonnie? Okay. Go ahead, John.

JOHN CARLSON: Incidentally, I do have a groundwater master's degree, but it's been 50 years since I had to make a living at it, but I touch on it all the time.

First of all, I like your paper and I like the pictures and the figures; I think they're outstanding. But I think you ought to put a page in there for definitions, even something as simple as

riparian for whoever touches it. But, what's hydro-riparian versus meso-riparian? I even know what wetlands are. In other words, you need a little guidance here.

And I'd love to see a map picture in there and identify Cienega, Arivaca, Rincon Creek (inaudible), Madera, et cetera, et cetera, because as you go back and forth and realize what you're going to try to do and when.

And on page 20, you keep talking about a shallow - was that me? - shallow groundwater - and you mention it early - but you got to go over it and have real good eyes on page 20 to find out that you feel that it's 20 - 50 feet or less, if I'm right on the thing, but what is shallow groundwater? Especially if our - the politicians that are going to vote on these things get ahold of it, I think they need a hand- - hand-holding introduction.

FRANK POSTILLION: I think we defined it earlier in the paper -

JOHN CARLSON: Yeah.

FRANK POSTILLION: - we can find it, but it is in there earlier in the paper.

JOHN CARLSON: Well, good, but I looked and looked and looked. I'm just saying it ought to be self-evident early.

And over-bank floodplain, I think I might know that, but what's the next person know? (Inaudible) flow result; what is that? The riparian versus - riparian vegetation versus other vegetation. But I really like all your charts and everything else; that's enough.

CHAIRMAN MARCELINO FLORES: If I'm not mistaken, Figure 9 shows the riparian areas, names, amount; is that correct?

JOHN CARLSON: Okay. But what is it? What's meso-riparian?

CHAIRMAN MARCELINO FLORES: You had asked about a map, a map that shows the riparian areas that were talked about, Figure 9, page 10. Bonnie?

JOHN CARLSON: I don't think that's good.

BONNIE POULOS: I recently went to a lecture at the University of Arizona and one of the ecologists is proposing to use satellite imagery to actually identify plant quadrants from satellites, as

opposed to actually having to go into the field to monitor those kinds of things. And, apparently, the technology is such that you can identify individual plant species from these photographs.

My question is: Has anybody ever proposed that for municipalities who are trying to study exactly this sort of thing? Because it seems to me that if you could use that kind of technology, you could overlay it with maps of groundwater of exempt wells and where they pump groundwater, and it could be used not just for your own use, but also as an educational tool so that people could actually see visually what the real impacts are over a period of time of groundwater pumping within a certain area. It's just an idea of something that I didn't know really existed and I just wondered if anybody's proposed using it for something like this.

SUZANNE SHIELDS: We regulate riparian areas, and our riparian maps that were developed, both for our ordinance as well as our Sonoran Desert Conservation Plan, we did use satellite imagery to identify - we have like 86,000 acres in the unincorporated that's regulated riparian - into the different classification of the type of zero-meso and hydro-riparian, so we - we have used that in the past.

The other thing that we - we do is in most areas we're pretty fortunate - our aerial records go back to 1939 - and, as technology has improved, we are getting better and better at being able to identify and look at that kind of thing and to be able to see how things have changed over time. And so, yeah, we - we do do that. We have aerial flights every other year to be able to check on some of these things and so some of the technology is there, definitely.

BONNIE POULOS: (Inaudible; not speaking into a microphone) - as well to try and get rid of some of these exempt wells that could be creating some of these problems and to make people aware more visually of what they're -

SUZANNE SHIELDS: Yes, that the loss is occurring now; not just, you know 100 years ago.

CHAIRMAN MARCELINO FLORES: Vince?

VINCE VASQUEZ: It seems like the heart of the problem - I think it's what we discussed a little bit last time - is that - is that really Tucson Water's potable and reclaimed system represent, essentially, our best chance at establishing a regional system with reliance on - on renewable

supplies. And it gets into what Suzanne was speaking too with - with wheeling to various providers around - around the - the perimeter of - of the incorporated Tucson area that don't have easy access to the CAP or a CAP turnout, you know, or even a reclaim facility.

And it seems like that there's going to be a time where if the community really wants to reduce the environmental degradation that's going on because of groundwater pumping, there's going to be a question of, "Well, how do we - how do we relieve these - these people from - or how do we get them off groundwater for essentially the same cost as what they're currently pumping it for?" And it really comes down to: Is the community willing to subsidize that so that - such that we can achieve the kind of environmental protection that we really want. And it also gets into just extending the - Tucson Water's regional - regional system out to these exempt - exempt-well areas and taking them off their exempt well.

But, again, it - it - to me it comes down to an issue of cost because no one's going to come off whatever water they're using if it's cheaper than the water that you're offering them. And so, unless we're willing to subsidize that in some way as a community, it's - it's a long conversation towards nothing.

SANDY ELDER: You described it well. The cost to pump an exempt well is, you know, it's tens of dollars. To extend the pipeline, get a meter, tens of thousands, and so

...

BONNIE POULOS: Can you tax a well?

SANDY ELDER: Can you tax a well?

BONNIE POULOS: Yeah, I mean, they may be exempt and they may be allowed to pump, but can you tax the well for the water that they're removing from the aquifer?

SANDY ELDER: I don't know. I can't answer.

MARK STRATTON: Well, with the exempt wells you don't know how much they're pumping because they're not regulated.

RALPH MAHER: And to follow up with what Mark's saying, non-exempt wells are taxed -

MARK STRATTON: Yes.

RALPH MAHER: - by the State, so . . .

SANDY ELDER: The tax that we pay pays for Arizona Department of Water Resources; that's one of their funding sources, so . . .

MARK STRATTON: We think.

SANDY ELDER: We hope.

VINCE VASQUEZ: But that tax would also then go to all the recovery wells that Tucson Water uses to retrieve physically available renewable supplies; correct? I mean, you - that - that -

MARK STRATTON: No.

VINCE VASQUEZ: - well tax on non-exempt wells would extend - will extend to your wells outside of CAVSARP; correct? I mean, you're looping in a big - a big - do you follow what I'm trying to say?

RALPH MAHER: We're taxed also on recovery as well.

VINCE VASQUEZ: No, no, I'm - I'm saying that if you - it sounded like Bonnie was going down the road of, well, we can - we can tax - we can tax these exempt or non-exempt groundwater users via - via the well tax and we'll incentivize them to come on more expensive renewable supplies, but by doing that you're even - you're looping in all the people, including every designated provider in the - the region who is using recovery wells to access renewable supplies. That's all right. We don't have to go down there.

RALPH MAHER: Okay.

SANDY ELDER: I think if you get - I mean - some sort of flat tax, you might get - something off a property tax or something, but they're not even registered on the (inaudible).

FRANK POSTILLION: Yeah, I think that's the whole idea of being exempt.

SANDY ELDER: Yeah, yeah.

UNIDENTIFIED MALE SPEAKER: You can't touch this.

SANDY ELDER: And I think a lot of the exempt ideas really come strongly out of the rural community, and the rural parts the State. You were talking about the lobbying efforts -

MARK STRATTON: Yeah.

SANDY ELDER: - you know, in our situation in the AMAs is one thing, but you go out into the - it's the only water supply in the rest of the State, so you're really - it would be an uphill battle to get State law.

RALPH MAHER: One last comment here and that is that - Vince was alluding to this - and that is that pumping groundwater is relatively cheap, and that when you talk about bringing in wet, renewable supplies and to convey it someplace where it's going to be used, it's very expensive; it is very, very expensive to shift to renewable, sustainable supplies; and, yet, that is the challenge that is before us in the region, you know; it's not just here it's a lot of places; that renewable supplies, sustainable supplies are much more expensive.

JOHN CARLSON: Well, if you live long - it won't be me, but it's - you younger people are going to have figure that one out. There was a study on bringing in the water from the gulf of California, and one of the things was, my, God, what are we going to do with all the salt? Then somebody got smart and says we'll put an atomic plant down there and leave the salt, but it's still, like you say, incredibly expensive, but it's up to the next generation as to whether this is that good of a life that they're willing to pay for it.

CHAIRMAN MARCELINO FLORES: Seems like we're kind of narrowing down on questions. I had a - I guess a request for clarification. When you have the recommendations, the initial one of financially support the continued acquisition, that's - the entity that's doing that is through the County SDCP; is that correct?

SUZANNE SHIELDS: Yes, it's through the County open space bond program, as well as our Flood Control flood-prone land acquisition.

CHAIRMAN MARCELINO FLORES: Okay. And - and the - how do we financially support that? I mean, do we - is there any threat of that -

SUZANNE SHIELDS: Well -

CHAIRMAN MARCELINO FLORES: - resource or pot of money going away being used somewhere else?

SUZANNE SHIELDS: We get those funds by going to the voters to authorize general obligation bonds, and there's been enough strong support in the community that they have - they have approved those bonds; but, as time goes on we need additional bonds. Also noted in here - which goes back a little bit to what they were talking about - is the expense to be able to extend renewable water supplies out there.

In a future bond election, as discussed in the paper, was the thought that through general obligation bonds, as opposed to user fees, to see if the community has enough support to be willing to fund reclaimed water line systems; that would greatly reduce the cost of reclaimed water that you buy, because right now the highest cost is not only Tucson Water builds it out, they - they want to reclaim those costs for the infrastructure improvements. And so it's something that is education to the general population so that they understand these issues and would vote for and support bonds funding.

CHAIRMAN MARCELINO FLORES: So that sounds like a public awareness task as well -

SUZANNE SHIELDS: Uh-huh.

CHAIRMAN MARCELINO FLORES: - to be included?

The - the legislative - the City and County should promote changes to State rules and laws. What mechanism is being thought of or proposed to do that? Is there a partnership here that may be - is being thought of, the southern Arizona water users or other entities to try and do this? I know there are some limitations on lobbying for governing bodies; is that correct? Or . . .

SUZANNE SHIELDS: Well, the Association of County Board of Supervisors in the City, we do put together legislation and we do lobby for it through - not individuals, but through our lobbyists. I think there's two tasks here; one that the County has been pushing for a long time is better controls of wildcat subdivisions; that's one area where - because we're not chartered - it's more difficult for us because people can do splits of five. I believe the City, you restrict the splits to three, but we have to go with State law that says splits of five. And so you get these parcels that big and split into five and then each of the five split into five, and each of those five split into five, so those are the type of situations where you get those exempt wells. And so something that controls wildcat subdivision would also be - be

useful; that didn't used to be such a problem in other counties and they're now finding that they're having the same problems that - like Pima County has had, so that would be one effort and then, of course, as - as southern Arizona water goes.

MARK STRATTON: Yeah, to go along with that, too, on - on - you had mentioned on the mines for legislation, one of the things with - with the groundwater law, it does require municipal providers to have a replenishment obligation for anything built after 1995; that is the only sector that has a replenishment obligation, so a new mine going in would pump a tremendous amount of water and has absolutely replenishment obligation as part of their criteria.

JOHN CARLSON: Well, does that - do they have to be on federal land for that to apply?

MARK STRATTON: No, they just apply for a water right.

RALPH MAHER: And just to add to that, you know, when the Groundwater Management Act was established in 1980, the mining industry was given certain exemptions and this is an example of one of those exemptions.

CHAIRMAN MARCELINO FLORES: Would the Fourth Management Plan be able to effect some of that, or is that process, if it happens . . .

MARK STRATTON: Well, the problem is right now is whether or not ADWR is going to actually be able to get a Fourth Management Plan done in the Fourth Management Plan period, because they - they are losing staff, they're losing resources, and the latest word is that's way down on their list of priorities based on what resources they have available.

RALPH MAHER: And following up here with your question and that is that: These exemptions, for instance, that the mining industry has, I believe they're statutory -

MARK STRATTON: Yeah.

RALPH MAHER: - I believe they are; they may be rule, but I believe they're statutory; I think they would make them statutory, so they have a pretty strong position.

VINCE VASQUEZ: Suzanne hit on a good point I think and it's - I know it's one that - that has often been brought up by the development community, and I'm not try to totally drag it back, but

I do think it's worth talking about and it's this idea that, as you develop land from an economic standpoint, you're trying to just maximize your profit out of that - out of that action.

And, as you continue to lay on more and more regulations which have a cost component, that requires a greater investment in infrastructure or in - in the - the cost of the finished lot or the home. You're - you're putting a pressure on - on a dangerous situation in terms of pushing towards, well, it just makes more sense; it pencils out better for me just to - to split it up and to wildcat it and to have a real nasty exempt well problem on your hands. When, in fact, you can have a more - even though it may not be the - the ideal situation in a planned community set up with a private water company, you will have more centralized control with accurate DWR accounting and like, you know, to - to your point earlier regarding the - the system in the - the Sabino area, that it was - it was a better, although not perfect way, to manage water in that area; it was a better way than continuing it under a wildcat exempt well type situation.

So, I think as we get into that discussion with the land use - connecting land use and water decisions, wildcats and exempt wells as the - as the far end of that continuum, it - and maybe planned communities as the - as the middle ground between where - where - where we would hope to be.

CHAIRMAN MARCELINO FLORES: Give the audience a chance to make any comments or questions.

MARGOT GARCIA: Margot Garcia. I just wanted to make a quick comment about exempt wells. I live in a neighborhood just not too far from here, and probably 60% of the neighbors in the last two years have sunk wells. So, when you're talking about it, it's central Tucson as well. And my feeling is, you know, it's fine now as the City is not pumping from the Central Wellfield and their water is nice and high. Let a drought come along and we start pumping that Central Wellfield they're going to have - sing a different tune. And a lot of them have turned off the water from the main. I see the red stickers on their water meters that says, you know, this water is no longer connected and they've removed them all, but they were there.

CHAIRMAN MARCELINO FLORES: Any other comments or - or - go ahead, Sandy, you're about to respond?

SANDY ELDER: Well, I'll let . . .

BERYL BAKER: My name is Beryl (ph.) Baker. Do I have to do anything else? It's been interesting listening to the conversation. Anybody who knows me knows I'm a very strong supporter of protecting riparian areas and water and et cetera, et cetera, et cetera.

Having just watched Flow, though, I - which is basically about how we're going to be running out water and the next water wars are going to be about - our next wars are going to be about water and how in some places the government is actually privatizing people's wells and basically owning the water, and nobody else has any rights to the water. In fact, in some countries, apparently, they say they even own the rain. I would just caution people about . . . making it so that people don't own water or don't have the rights to water.

Yet, on the flip side of that, I think it was Brad Lancaster who gave us the information that if we were to water harvest all the water that comes off the City right now, that we could provide all the water that's - that the City needs for their water without pumping.

CHAIRMAN MARCELINO FLORES: Any other comments, questions? I might be able to make up some time for the last time I went over when I chaired.

BRUCE GUNGLER: Marcelino, could I - I . . .

BONNIE POULOS: Can we give you a round of applause?

BRUCE

GUNGLER: I just wanted to say one thing in relation to these three papers before we did close today. Going into them, I obviously didn't know what to expect, 'cause I hadn't read 'em yet, but I was very impressed by the amount of research and - and the way these things are put together and I want to thank you guys. I think this is a great body of work and really appreciate the efforts that you've made in that regard. (Applause). Thank you.

CHAIRMAN MARCELINO FLORES: Thank you. Yes, it is - we - I'm interested to see how our comments today are going to be incorporated and addressed. I think, though, the technical papers will not be changing, but we have heard some suggestions, like just for example, the legislative process, there seems to be some clear steps or goals that exist within there and, perhaps, we can expand that as part of the Committee's report, and we'll need some help doing that.

Bonnie, do you have a comment? No? All right. So, we have -

JOHN CARLSON: Good night, Irene.

CHAIRMAN MARCELINO FLORES: Good night, Irene. We had put the Agenda for the next meeting on here; if everyone can look at that. We have planned, I believe . . . we're already in our Comprehensive Planning and Environment Section. Wow.

But the next meeting, June 25th, Location of Growth and Urban Forum and Cost of Infrastructure, one big, gigantic topic. I'm not exactly sure why we had the Agenda on here, but is everyone comfortable I - I guess with the process and the time line for - for completing I think now before September, August? Any further Call to the Audience? Okay.

BERYL BAKER: Beryl Baker. This isn't directly related to your subject tonight, but it is concerning wastewater. I was just reading the *Scientific American Today* about phosphorous and how we have in this country probably 40 years left of mining phosphorous for fertilizers and maybe worldwide 90 years, and how there's a disconnect. And a lot of our phosphorous ends up in our wastewater and ends up going down the rivers and other places and that maybe - I'm just suggesting that maybe we can - as the wastewater plant comes on line and you use reclaimed water and et cetera, maybe we could figure out a way to . . . to draw that phosphorous back out and put it back on the fields and et cetera, so we get back into the cycle of putting phosphorous back into our earth so we don't have to keep mining.

CHAIRMAN MARCELINO FLORES: If I'm not mistaken we have water quality as a subject. I'm assuming it includes wastewater water quality; is that correct?

UNIDENTIFIED MALE SPEAKER: Yes.

WILLIAM CROSBY: I recently looked into the eyes of my brand new granddaughter and she looked back at me with those grandmother (sic) eyes which said, "I trust you to provide for me." The sustainable future.

(Applause.)

CHAIRMAN MARCELINO FLORES: With no other comments from the audience, is there a motion to adjourn?

BONNIE POULOS: Motion to adjourn.

CHAIRMAN MARCELINO FLORES: Okay. Have a great week.

(Conclusion of meeting.)

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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 May 21, 2009.

Transcription completed: June 16, 2009.

DANIELLE L. KRASSOW-TISDALE