In The Matter Of:

Narragansett Bay Commission

CSO Phase III Stakeholders Meeting

December 04, 2014

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AGENDA: CSO PHASE III RE-EVALUATION
STAKEHOLDERS MEETING

DATE: December 4, 2014
TIME: 9:00 A.M.
PLACE: Narragansett Bay Commission
Corporate Office Building
One Service Road
Providence, RI 02905

PRESENTERS:

Michael Domenica, Moderator
Vincent Mesolella, Chairman, NBC
Tom Brueckner, NBC
Richard Raiche, MWH
Nick Anderson, MWH

STAKEHOLDERS:

Angelo Liberti
Doris Aschman
Steve Scialabba
David Turin
Sheila Dormody
Brian Bishop
John Hart
Jared Rhodes
Michael Gagnon
Al Mancini
Harold Gadon
Tom Borden
James Boyd
Greg Gerritt

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Michael Walker
Jan Reitsma
Steve Coutu
Lance Hill
Caroline Karp
Amelia Rose
Gregory Schultz

OTHER ATTENDEES:

Bob Ototski
Jean Lynch
Gail Degnan
Joe Haberek
Sherri Arnold
Kathryn Kelly
Matt Travers
Elizabeth Scott
Pam Reitsma
Christine Comeau
Tim Theis
Larry Riggs
Jim Kelly
Eliza Moore
David Peterson
Melissa Carter
Gavin Gilchrist
George Palmisciano
Jamie Samos

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(MEETING COMMENCED AT 9:10 A.M.)

MR. DOMENICA: I'm Mike Domenica, and you know, I've been moderating the workshops and will be moderating today. It got very quiet all of a sudden. I presume we're ready to start, so thank you all for being here today and your involvement through the months as we've had the workshops.

This is scheduled to be the last workshop, and as such, Chairman Vincent Mesolella has some words for the group today. So we'll start with the Chairman. Mr. Chairman.

CHAIRMAN MESOLLELA: All right. Good morning, everyone, I'm Vin Mesolella, Chairman of the Narraganset Bay Commission. I've been here a long time, more than half of my life has been spent working with the Narragansett Bay Commission.

I came on in 1979, became Chairman in 1991. And I can remember the days when Narragansett Wastewater Treatment Facility did not look anything like it looks today, and not achieved any of the kinds of successes we've achieved through the years. I've seen this plant and this facility go from one of the worst

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polluters in the entire country to the best operated and maintained facility in the country the centerfold story of the 25th anniversary of the Clean Water Act. And for that I'm very proud to be a part of this facility. And I want to thank you, all of you, because all of you were a large part of the successes that we've enjoyed today. Starting from the very, very first Stakeholder's process, when we began the CSO program. Oh, my God, Jamie, how many years was that?

MS. SAMONS: 1990 something.

CHAIRMAN MESOLLELA: Oh, that's the senility sinking in. So I would like to take this opportunity, and I wanted to take this opportunity to be here today to thank all of you for your participation and for many of you who were there at the very beginning. I particularly want to thank Harold Gadon for his support.

The Citizens Advisory Committee has been an enormous, enormous part of the successes that we've enjoyed here at the Narraganset Bay Commission, and I want to thank Harold and the Citizens Advisory Committee for his

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participation, not only on a monthly basis or a weekly basis, but on a daily basis. So once again, thank you very much. And by the way, we're having membership drive, are we Harold, for the Citizens Advisory Committee. So anyone who is interested in joining the Citizens Advisory Committee and staying involved in the process, we certainly would welcome your input.

So having said that, I really make it a habit of speaking extemporaneously because I really don't prepare remarks very well, but I did make a couple of notes and issues that I'd like to talk about. And one of those things is you, by being involved in this process, you recognize the hurdles that we have to climb to achieve successes, the continued successes, the complexities of regulatory process, the construction process, the political process and the environmental concerns.

So we have been very vigilant at looking at those issues. And I have to say that on behalf of myself and the board, we have always been concerned about the financial impacts that undertaking a project of this magnitude will have on our ratepayers. And I

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always felt it was paramount for me and my responsibility to keep a vigilant eye on the impact of our ratepayers. You probably have always heard and you will see what the economic impacts are and the impacts on affordability for our ratepayers.

I can tell you that our board is extremely concerned about that. It's as being a leader of Narragansett Bay Commission Board of Commissioners, it's always been my attitude that cost benefit ratio is the equation that we need to be most mindful of. And I know that we're going to be looking at four potential options of how we intend to proceed with the CSO project. We're going to take this to the Board of Commissioners. And I can assure you that our board maybe more than any other board in the state, kept apprised of all of the activities of our staff and our ongoing operations. We make it an absolute -- it's imperative that we keep them apprised at board meetings every step along the way.

So I don't care if you see any of our board members on the street. If you ask them a question, they can give you an informed answer. I'm absolutely convinced of it. And a lot of that is to Tom Uva who goes overboard to

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make sure that our commissioners understand the complexities involved in these processes. I can tell you this on a going forward basis. On a going forward basis, I said this at our board meeting. I think it's imperative that we do some modeling with regard to the cost. I know MWH has already done some, and we're talking to some of our investment bankers, as well.

The executive Director, Ray Marshall, and I have had this conversation on numerous occasions, and that is one that we're trying to make a decision as to whether or not in order to level out our rate impacts that we extend the life of this project. And, of course, you know we like to play devils advocate with each other, and I said, well, you know, in today's dollar that may make sense, but we don't have any idea what interest rates are going to do. I suspect they're not going to go down any further.

So, what does a 50 basis point increase on our borrowing rate do for the cost of this project and one percent. And we intend to do some modelling on that. And then we will come to some decisions as to, you know, what we

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believe to be the optimum process. So these are things that we will be considering in the course of the upcoming months. We intend to go to the Board with some recommendations. I think in January, Ray am I right on that? Where are you, Ray. Thank you. We intend to go to the board in January.

We'll hand this off to our construction engineering and Operations Committee and probably our Finance Committee, as well, and we'll go through some very detailed analysis on how we should proceed, and we will, at some point, reconvene this group, and kind of give you a sense of how we're intending to proceed, and perhaps get your input on that, as well. But I can assure you of this, whatever decisions you make, you'll get a one thousand percent effort from our staff and employees, as well as our board.

I want to thank the Board and Commissioner Burrows is here. He'll keep this on the straight and narrow, and we will proceed with diligence and perseverance, and we'll make this project as successful as the previous two.

So once again, I would like to

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thank all of you again for your participation. It's been a long process. But what I do know is it will be worth it at the end, and it will be a successful project. So, thank you, thank you very much.

MR. DOMENICA: Thank you, Mr. Chairman. We're ready to get started and MWH is ready to start presentations. I have a few reminders that I've been reminded of by several people already. They told me to be forceful as I express the requirements for our discussion.

Number one, when you start say your name and affiliation loudly and clearly, especially on this side of the table because Paula can't see your name tags, and on that side of the table you can't see your names. So say your name clearly and loudly. It will be very helpful. Also, if you're speaking from the audience or not with the microphone in front of you, please use the microphone that's on the stand there in the center of the room, so that everyone can hear you.

Also, very important, is that only one person speaking at once. Sometimes in the record, if there are two people speaking,

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sometimes even three. Paula has two hands, but she doesn't have three. She can pick up two people, no, she can't. So one person at a time and speak clearly and concisely, if you would. And with that I'll give it to Rich Raiche to start us off.

MR. RAICHE: I haven't even started and we already have a question.

MS. KARP: My name is Carolyn Karp, Brown University. Could somebody before this meeting is over talk about the stormwater initiative that's going on with the City of Providence, and all the other cities to try to get a utility district going. I've never actually heard what volume of water can come out of that.

MR. RAICHE: I just saw Sheila walk in. We'll let her get her coat off before we put her on the spot, at the very least.

MS. KARP: Just before the meeting is over if we could do that.

MR. RAICHE: Well, thank you all for coming. We've broken it up into a couple of pieces. We'll start off today with the introduction of the alternative plans for

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evaluation. Our plan here is to get through those definitions and then take our break, and then come back and compare those plans against each other, both in terms of water quality and affordability and conclude our process today with some conclusions. This is the part of the presentation where I usually review where we've been, the different steps.

At this point I think we've already known where we've been, so rather than do that, I'd just like to thank Stakeholders and the other individuals for sticking with us through this process. There's been a lot of information, Nick and I, and all the other engineers from MWH and Pare have thrown a lot of techno gobble gook at you and you've been very game in entertaining our techno babble, and I appreciate it, and I appreciate all the input that we have had thus far, and hopefully we have a little bit more today. So without any further ado, we'll talk about the alternative plans.

We have four to introduce today. The first is the baseline CDRA. This is sort of our baseline by which we can evaluate all the other alternatives. So we'll introduce that and

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describe it in terms of the other plans.

The second takes the analysis that we have done. If you recall, we went through sort of a subsystem alternatives analysis, and picked apart the old plan and made some improvements to it, or at least I'd like to think they're improvements to it. So we have the modified baseline.

And the other thing that we've done with what we're calling Alternative 2 is broken it into phases. As you recall, the overall objectives of Phase 3 are very similar in scope and cost to what was Phases 1 and 2 previously. So Phase 3 is a rather ambitious construction project. So the concept was if we divide this into phases and extend the schedule, what would that look like, and that's the basis for Alternative 2.

Now, Alternative 2 does the phasing based on what we would think is the sort of ideal case, particularly in terms of water quality. We use the rating criteria that we developed a few months back, and rated each one of the components and phases based on that, and frankly, all the logistics because you can only

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do something downstream before you do something upstream.
Alternative 3 takes a slightly different view on that and reorders the phases and extends the schedule. As we've been discussing, affordability is a large concern and spoiler alert. The tunnel is the biggest component of the overall plan, has the biggest benefit, but also has the biggest cost.
So Alternative 2 takes a slightly different view, and puts out that cost a little bit further into the future. One of the other things we had talked about during the subsystem alternatives analysis are that there are other things that we could do that aren't necessarily the final solution, but can improve water quality in the interim. These are specifically the screening and disinfection ideas that we had been talking about. So in Alternative 3, we also put into that mix, the screening and disinfection ideas.
Alternative 4, takes an entirely different tactic. And this is sort of a newcomer to our evaluation, and we'll get into the details of that when we get to Alternative

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4, but it is also phases but has a completely different set of design objectives.
So this should be a little bit of review in terms of what we had been talking about in the baseline, but how would we step this out a program in terms of sequencing. Well, coming out of our process today, we'll have a regulatory review of this Phase 3 redefinition effort. That would conclude as soon as we submit the report and take some time to do.
Then it would take some time to do the preliminary and final design on those systems. We anticipate that that overall time scale is on three-to-four year sort of a duration. So that by 2019 is when we would break ground. So on the baseline we'd be breaking ground in 2019 and fast tracking as much as we can.
We would begin the Pawtucket Tunnel construction which is the longest duration component of the overall plan. Do that simultaneously with the Pawtucket Avenue Interceptor. We can do that because we've got a pump station on the 220 side so we can start

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construction on that side and move towards the tunnel and also do the 206 sewer separation. And then round out that program with the sewer separation. The Providence areas and the Middle Avenue Middle Street Interceptor and the High and Cross Street Interceptor.
We can't start construction on those until we at least have the drop shaft for 205 done so that's the connection point, so it's just sort of a logistical concern. So on the baseline fast track one phase, we would envision that the fastest we can complete all of this construction is 2025. The cost of that program, as we've talked about before, is the 750 million dollar value.
So if we look at what this is in terms of cumulative cost spent and reductions in CSO discharges to the bay, so in 2023 the tunnel would be complete, and we'd have the Pawtucket Avenue Interceptor done, so we'd also capture 220.
So we'd have a dramatic reduction in CSO volume discharge to the bay in 2023. We would also have spent an awful lot of money by then. And then in 2025, we'd pick up the

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outliers both on the Northern end in Central Falls and Pawtucket, and in Providence.
So we'd drop down to zero discharge for the three-month storm in 2025, and we've also completed spending our money on Phase 3 by then.
MR. BISHOP: I'm wondering, do you have a graph similar to that that rather than presenting the, or rather than just comparing that to the capture of the three-month storm that compares that to the existing expenditure for Phases 1 and 2, the amortization. I mean, I'd actually be interested, because basically you're showing baseline cost and realistically from a practical point of view if we're examining cost, what I'd like to see is how would it cost for what we've done, when do those tail off. That's what I would like to see.
MR. RAICHE: When we get into the affordability by the end of today's discussion, those costs are built into where our rate projections are. I don't have sort of the -- these are additional capital costs. We'd had zero additional capital costs for Phase 1 and 2.
MR. BISHOP: Right, that's kind of

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what I' getting at. In other words, and I understand now it's factored into the rates, or whatever, but given that this process focuses essentially on the you know, on the necessities to spend a lot of money to effect CSO mitigation, I think that the optics are, you know, how much money have we spent to date. People are paying it off at a certain rate, you know, when is it practical for them to make this more additional investment. So I'm just hoping that --

MR. RAICHE: It is built into the affordability models in the graph that we show later. I don't have it in this format. I would say that, in general, and Karen can correct me if I'm incorrect on this, that the debt on Phases 1 and 2 doesn't really start to drop off until 2038, and doesn't completely drop off until 2044 in round numbers. That's my understanding where the drop offs are. It's definitely on these out years. So we went through the subsystem alternatives analysis, and what is our modified baseline? Well, the alternatives analysis subsystems analysis concluded that there were several elements in

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the baseline plan that are still preferable. We brought in our evaluation criteria, what the costs, costs per gallon and water quality and construction disruption. And there were several elements of the baseline plan that were determined to be the right way to go.

So those are the Pawtucket Tunnel, the Middle Street Interceptor and the High and Cross Street Interceptor, as well as the sewer separation for 035 in Providence. There were several components that were altered. The sewer separation for 206 is changed to a hybrid with sewer separation and GSI.

The Pawtucket Avenue Interceptor was determined to not be preferable. We do have two options that we're still carrying forward into preliminary design for that, is either a tank over near Morley Field, under Morley Field, in that general area, or a stub tunnel.

The stub tunnel at this moment is preferable for a number of other reasons, but requires additional study. The West River Interceptor is preferable to the sewer separation for 039 and 056. And then there were new elements introduced, most notably GSI.

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There was no GSI in the baseline. We are incorporating the green stormwater infrastructure in targeted areas into the revised baseline.

And the other thing, as I just mentioned a little bit earlier, is consideration for screening and disinfection. So that leads us to our Alternative 2, which is our modified and phased baseline. So what would that look like?

Again, we've got some lead time here for regulatory review and preliminary design, starting essentially in 2015. In 2016, we would start the preliminary design on what we call Phase A. Phase A would essentially go from 2016 through 2023. We would start with the Pawtucket Tunnel.

Again, against our weighting criteria, our evaluation criteria, this is the single most important element in terms of water quality. It also has sort of the least construction disruption to most of the people who live above the surface. And we would incorporate GSI in each one of these phases. So in the first phase we target the areas where we

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believe we have the most cost benefit, and that would specifically be the sewer sheds for 212, 213 and 214. So sort of in this general area. That phase would conclude, and then we would start Phase 3 in 2024. And that would be extending the, essentially tunnel capture north into Central Falls and Pawtucket, with the Middle Street Interceptor, the High and Cross Street Interceptor, and do the hybrid GSI sewer separation for 206. And again, in this phase we would incorporate GSI, and in this phase we'd target 101, 104 and 105, which is essentially in this area of Central Falls.

Moving on to C, which would commence in 2029, that is when we would do the stub tunnel to pick up 220. We'd then target GSI for 216 and 217, which is generally in this area. And finally, we would conclude the Alternative 2 with Phase D, which then picks up the Providence outfalls with the West River Interceptor and the sewer separation for 035.

Now, we've added some premiums to this plan versus the baseline plan. The GSI was not in the baseline plan. That's an additional cost. The stub tunnel which we're evaluating

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through preliminary design, at least, as our preferred alternative mostly because it gives us some flexibility on the Branch Ave. Interceptor relief which requires some additional study carries with it a premium. So the total program cost that we're carrying for this is 810 million dollars. So you can see here that essentially by that same first milestone, 2023, rather than, you know, round numbers in 80 percent capture, we're at about 70 percent capture.

Moving along with the interceptor work and we drop down. That's where we get to our 80 plus percent maybe 85 percent, pick up the stub tunnel, and then the Providence outfalls. It does mean that we'll have some early years expenses, because again, the tunnel is the single most expensive component, and it has to be done essentially all at once. So we have sort of a corresponding with this large capture and large initial expenditure and expenditures continue to increase as these out projects are done.

Now, one thing that I do want to mention here is that we do have potential optimization on this plan. We've got a higher

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price tag, as I said, and we're carrying that through the affordability because this is a system that we know will work. It's, I don't want to say foolproof or idiot proof, but at least proof enough for this idiot.

There is a lot of potential optimization that we have identified with the tools that we have, however, we're cautious in carrying some of these things through the financial analysis, because we need to get through the preliminary design phases to really test them out. We've got the hydraulic model tool which tells us a lot of things and has been able to point the direction for a lot of this optimization, but we need to expand that model into the collection systems so that we are sure that we're not causing any backups in the city systems that would impact level of service.

We also need to do some surface water modelling to better understand exactly how the GSI would work and what the benefits are. As we've said all along, the GSI where we looked to implement GSI is where it gives us a cost benefit, right. We have the social benefits from GSI, and that's fantastic, but what we're

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really doing here is capturing stormwater in the system in the sewer sheds that then allows us to reduce the cost of the corresponding gray stuff. We haven't taken any of those credits in that number. We know they're there, but we're not comfortable saying what the number is, how much we can reduce the gray stuff until we've done more thorough modeling. So we're carrying some conservative costs there.

We have a number of concepts with more advanced tools and more study to reduce costs. I mean, some ideas are combining drop shafts for 217 and 213, doing realtime controls on how we get flows into the tunnel that would allow us to reduce the tunnel size and optimize system storage. GSI in this area up here of Pawtucket, 201 through 203, and we believe some work on the existing interceptor systems would eliminate the Middle Street Interceptor altogether.

Another concept is to extend the tunnel beyond 205, all the way up to 103. That would allow us to eliminate the Middle and High Street Interceptor.

Again, these are things that we

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have to study a little bit more to know if they are completely viable. In terms of concept and what we're trying to achieve, they would be the same, so in our view these are preliminary design sort of decisions. The outfalls that happen, the volumes that each one of the outfalls wouldn't change.

So it doesn't radically alter what the concept is, it's just optimization of the overall system. And we do believe that the cost savings from this are probably in the fifty to a hundred million dollar range, and could possibly be even more than that. Jan.

MR. REITSMA: So I guess I just need to clarify what we're really saying when you're talking about potential optimization, and I'm not trying to unduly nail you down, but are you talking about potential cost savings?

MR. RAICHE: Yes, absolutely. These are all potential cost savings that at this concept level we're not comfortable putting through the financial model, but these are all things that we'll drive down, when we talk rates later they will drive those rates down.

MR. REITSMA: Without comprising

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the effectiveness of this system?
MR. RAICHE: Correct.
MR. REITSMA: Okay, thank you.
MR. RAICHE: So what would that do to this first alternative, some of those optimization ideas? It would essentially increase the scope for Phase 1A, which is the Pawtucket Tunnel. We'd be adding some things like the realtime controls or different tunnel configuration. It would extend the schedule and for Phase IA, but essentially eliminate or dramatically reduce Phases 3 B and C. So, you know, it would have an overall cost savings, and will likely have an overall schedule reduction so instead of 2038, we would look on the optimist side of 2031 for completion.
MR. REITSMA: I'm sorry, one more follow-up question. So we're talking about the capital cost. I always get confused. That does not include O&M?
MR. RAICHE: The numbers we have here are all just capital costs on these graphs here.
MR. REITSMA: So when you're looking at potential optimization --

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MR. RAICHE: We would include that. And again, the affordability graphs that we have later, we do have projected O&M in there.
MR. REITSMA: Thank you.
MR. MANCINI: Al Mancini from the Division of Public Utilities. The cost dollars, are they in today's prices, or do you have another baseline here?
MR. RAICHE: The baseline for all of our costs which is something that we adopted a while ago and just because the costs show up in so many different places, we haven't adjusted them. They are all in 2018 dollars.
MR. BISHOP: Can I follow up on that by asking if you looked at all, because this essentially originated with the very preliminary thoughts on Phase 3 that came from the last Stakeholders, there would have been cost estimates associated with those, and I'm wondering if in carrying all this forward in 2018 dollars you can give us any idea how well, you know, whether our cost estimates at the time we made the cost estimates for Phase 3 really hold, or you felt like you had to adjust them as a matter of the results obtained, you know, by

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our project or others with these, you know, the tunneling and the surface work.
MR. RAICHE: Yes. The graph that we showed there from baseline case was adjusted for lessons learned on Phases 1 and II. So there was a somewhat dramatic adjustment from what was reported in the CDRA. However, the commission staff has made those adjustments in the reaffirmations of the plans and using sort of calibration to actual Phase I and II costs. And we're very, very close to what was in the most recent reaffirmation.
MR. BISHOP: I'm just saying because in other words, we sat down 15 years ago to do this and we set Phase 3 aside, since we're sitting here now and whether this happens in 15 or 30 years, I'm wondering again while you maybe were getting closer, you give us a sense when you said there was a dramatic adjustment I assumed dramatically upward, but maybe I'm wrong.
MR. REITSMA: We do a capital improvement plan every year, so it's a five-year plan. So the one that we did about two or three years ago we updated the cost for Phase 3.

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Based on the experience we had in Phase 1 and 2, it about doubled from what was the original CDRA. And I think the cost that we're showing here now are higher than we had included in the first CIP a couple of years ago because we went to 2018 dollars.
MR. RAICHE: Correct, so it about doubled. But if you bring the 2018 dollars back to 2010 dollars, they are in the ballpark, they're not that far off.
MR. BISHOP: But they're doubled of what we did in 1968 or '70, '98, whatever year we were in. Thank you.
MR. RAICHE: Yes. So moving on. You know, Alternative 2 there is the sequencing and sort of a finance free world. Alternative 3 takes most of those same recommendations extends the schedule, and then adds in some interim projects that we had been talking about. So what does that look like? Again, we've got the concept review in 2015 and preliminary design of Phase A would commence in 2016.
Now, for Alternative 3, what we would start with are GSI in targeted areas, and again, these are -- it's going to be the same

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sequences before. So the 212, 213, 214 is our, from based on our current understanding the area will get the greatest benefit right out of the gate.

We would do the 206 hybrid GSI sewer separation as an initial project, and then as an interim project, and this again that something that isn't in the sort of final plan, but will give us some water quality benefits out of the gate, is to build an interceptor from 218, which is, if you recall, in the top two volumumetric spillers, bring that down to the Bucklin Point Treatment Plant and run that through the wet wether facility there, so we get treatment there.

Phase B commencing in 2020 would then do disinfection out at 220. Again, this is an interim project that would give us water quality benefits not part of a long-term solution. And in Phase B, we would also then do, you know, a GSI project, and again we would shift the focus up to Central Falls in this area for those targeted areas. One of the other things about Phase B is that B could be extended with this sort of philosophy, because C's, the

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tunnel is coming off. So say we put the tunnel off until we can afford it. Or Phase 2 B could continue to do some projects, in which case we would do initial GSI projects and follow that same prioritization ideas, so we would then do 216 to 217, and then move on to 201 through 204.

MR. BISHOP: I just wanted to ask. When you're giving us the kind of content of these plans. When we get to analysis, I assume we're likely to see or have broken out the kind of expenditures that essentially be interim when you do this.

In other words, there would be expenses, they're not free, but I'm assuming that interceptor is not cheap, but it's the kind of thing that I had asked about because of the size of that overflow very early on.

MR. RAICHE: Yes. Then C would be the Pawtucket Tunnel, and we would be incorporating some GSI into that one. We're now starting on cost curves to if we load a bunch of GSI into B, by the time we get to C and D, we're starting to have diminishing returns on some of these areas, but we continue to include them. 2D, where are we?

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And then 2D would move to the High and Cross Street Interceptor and then the Middle Street interceptor, this is essentially analogous to 3B in the other one. And then our rounding out the effort with E and F with the stub tunnel and West River Interceptor and the sewer separation in 305.

Now, the overall completion date for this, and again, it could be extended is 2047. So we're going out pretty far. And the overall price tag for this increases to $925. So specifically to your point, we would be doing 115 million dollars in temporary projects.

MS. KARP: Could you just go back to that slide a moment. I lost track of what happens with the 218 CSO, and the other previous 12 alternatives. Don't they all count on taking 218 down to Bucklin?

MR. RAICHE: Well, the other two alternatives the Pawtucket Tunnel is what picks up 218. So, ultimately, yes, it gets to the Bucklin Point Treatment Plant, but it gets to the tunnel.

MR. BISHOP: Can I actually ask just for argument sake because you're always

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talking can you shave three inches off the size of a tunnel, you know, various things, which when you're in the whole, obviously, it makes some difference. If you build that interceptor, is there another performance reason given the volumes involved in the possibility of modifying the tunnel that you might not actually include 218 in the tunnel when it comes to it?

MR. RAICHE: Ultimately, you would need to bring at least a portion, if not a majority of the 218 flow into the tunnel. It would modify your design of the tunnel, particularly where your drop shaft would be and how it operates, but you would still --

MR. BISHOP: Based on the inadequacy of the high rate treatment?

MR. RAICHE: Correct. So what does that look like now? So now we're starting to get into the more complicated graphs, so bear with us. The dark color here are what would be the falloffs of volume captured. So complete CSO discharge eliminated. So this is analogous to the other graphs in terms of the three-months' storm. So again, with what we put here with our initial timeline, it takes us to

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2023 to get to the point where Alternative 1 and 2 get to in 2032, as opposed to 2023, and dyslexic doesn't help at all. But what you do see in terms of cash flow is that your cash flows are moderate and then jump up when you build the tunnel, not surprisingly.
MR. BISHOP: Can you quickly distinguish the difference between the light and the dark red.
MR. RAICHE: So had you not asked the question, I was going to do that. So the pinkish color, again, this alternative includes some disinfection ideas, right. So, technically, it is still a CSO discharge, but it is receiving treatment.
So, you know, if you look at these deltas here and essentially this initial delta here, that is the treatment that we're giving the 218 flow through the Bucklin Point Treatment Plant because we put that interceptor in. And then this little additional -- where is it -- we're we've got the second one, that's where we put in the 220 screening and disinfection, right. So if you're looking for total CSO, discharge is up here, but we do have this sort

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of chunk here that gets treatment.
MR. BISHOP: I'm sorry, it's probably earlier this should go to analysis. I'm just kind of wondering if there's some administrative reason why the screening and disinfection which seems like a relatively direct and straightforward thing isn't, you know, and modest and relatively modest in cost isn't a little bit more frontloaded, but maybe --
MR. RAICHE: Well, this is actually about as fast as we could do it. Because as I said, we still have to go through RIDEM and EPA so that's there and then we have to design it and bid it, so that's there and then build it is going to take a couple of years.
MR. BISHOP: But I'm talking the screening and disinfection.
MR. RAICHE: It would be the same time frame, it would be.
MR. BISHOP: Okay, I thought that was the second drop.
MR. RAICHE: Well, the second drop is the 220.
MR. BRUECKNER: Brian, I think the

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reason we did it was to smooth out the cost somewhat. I mean, you could bring it back to the first one.
MR. BISHOP: Okay, and then those would move up a little.
MR. BRUECKNER: But the intent here was to really kind of push the cost out to a longer term to kind of reduce the rates so that's why we made that decision.
MR. BISHOP: Just trying to understand. Thank you.
MR. BRUECKNER: And we felt that 218 was a much bigger player than 220, so we wanted to pick that one up first.
MR. RAICHE: And the graph sort of bears that out. You see the larger drop here and then the second drop here, and meanwhile your costs are moderately accumulating. And when we get to the rate increases, you can see how that bears out as well.
MS. KARP: Could you just remind me. What percent of the flow would you capture and remove if you got 218 first. If you built this one tunnel from 218 down to Bucklin. That's a big one that effects the Seekonk, so if

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that became a priority, can you tell what percentage of flow would be captured?
MR. RAICHE: Round numbers is around 10 percent or 20 percent, 20 percent, sorry. Round numbers is 20 percent, but again we're not completely eliminating that, we're providing treatment for it.
MS. DORMODY: Can you just say the tunnel cost for Alternative 3?
MR. RAICHE: Is 925, so we've got a $115 million dollar premium.
MR. BISHOP: So, yeah, just again a quick technical question. Are there any costs envisioned for better facilitating high rate treatment or having more effective treatment at the treatment plant that are associated with that influx, or is it just the interceptor to get it there and you do whatever you can do?
MR. RAICHE: We didn't reflect either costs or, you know, discharge concentrations in this analysis. I would think that during preliminary design, we would want to do that. Personally, I'd love to do that. It sounds exciting. That's just me. Which brings us to Alternative 4, which is one that came late

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in the game, but is a completely different paradigm. This essentially would be storage and treatment at the Bucklin Point Wastewater Treatment Facility. This is our no tunnel alternative.

If you recall from our subsystem analysis, there was no tunnel alternative that fully captured the volumes that met our same objective that wasn't double the cost of the Pawtucket Tunnel. So we did want to present something that was a lower cost alternative acknowledging that it doesn't meet the same requirement. And the concept would be to build -- I'll step through the phases here.

The first and the same time frame would be to build, again, do our GSI in target areas the same sequence of that, build an interceptor from 218 to the plant similar to the discussion that we just had, but this time also build a tank near the plant for our analysis here both in terms of cost and volumes.

We somewhat arbitrarily took like a 14 and a half million gallon tank to capture that. So that would be Phase 1 or Phase 4, getting 218 down to the plant, putting it in a

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tank. Anything that doesn't fill the tank, would then be discharged.

Then the second Phase 4 would be to extend that interceptor from 218 up to 205, which is our other big spiller. So this is essentially providing connectivity between 205, one of our big ones down to the treatment plant. This would be kind of a microtunneled kind of thing, more close to the surface. So this isn't deep rock tunnel.

The objective of it is not storage, the objective of it is moving the flow and getting it down to our tank down here. And then also doing a small tank over at 220. Then complete out Phase 4, which is similar with the Middle Street and the High and Cross Street Interceptors to get those northern one which is essentially the same component as the other two, and then round out the program with the West River Interceptor and the sewer separation. So that's the same as the others.

MR. BRUECKNER: I just want to mention one other thing. Besides providing storage, the intent would be that those tanks would also be flow through treatment so that

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when you exceeded the capacity of the storage tank capability, you could still bring flow through the tank and provide primary sedimentation and disinfection, so you would actually be able to treat more than a three-month storm volume. The problem with the three-month storm, as you'll find out is the intensity of that storm creates problems in this alternative.

MR. GARRETT: On 220, when you do a tank there, does that tank include some treatment, or does the water in that tank eventually go where, because it's not going anywhere now.

MR. RAICHE: The 220 tank would be similar to what we evaluated during the subsystem alternatives analysis. That would be temporary storage, and then you pump out after the storm, and get it over to the Bucklin Point Treatment facility.

MR. GARRETT: So you'd still have to have some kind of -- I'd assume there's no connection between 220 and Bucklin Point now?

MR. RAICHE: No, there is. There is an existing interceptor that cuts across from

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the Moshassuck Valley over to, near the Seekonk River, essentially near the Tidewater site. So what does this one look like?

Again, and we built this in the hydraulic model and evaluated how this system would work. So we come along here, this first little drop in volume, that's the GSI. It shows up better on this graph than the others, maybe just because the resolution. But you see we have this initial drop in CSO volume. That's our GSI for 212 through 214.

And then we have this drop in CSO volume. That is because we're bringing 218 down to our new tank/treatment system at the Bucklin Point facility. The volume of that tank has excess capacity in addition to 218. So it's entirely using storage at that point. We then move into the second phase and bring the, start extending that interceptor up to towards 205. And what we found is that we use up the residual capacity in the tank. So this point right here where the treatment and the discharge, the untreated discharge diverges where we use up the treatment capacity of the tank. But we still do have spills out in the system. A microtunnel

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near surface interceptor, at the limit of constructability for a microtunnel for an interceptor will not bring all of the flows from those CSOs down to the plant. So we'll still have spills up and down the Blackstone and Seekonk Rivers.

MS. KARP: During a three-month storm?

MR. RAICHE: During a three-month storm, correct. And that's largely due as Tom alluded and Nick could give you more detail if you wanted. Because of the peak rates, you know, the flow starts coming very quickly and overwhelms the capacity of this additional interceptor so we do still have overflows out in the system. But we do get a bunch of flow down to Bucklin Point.

So as with the other graphs, we have this treated discharge. And as Tom discussed we would have treatment through this tank, as well, so it would become a flow-through tank. And we've got the West River Interceptor and the 035 separation which gives us this additional drop in overall volume. So we see, we don't achieve either the overall discharge

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reductions or the treated discharge reductions of Alternative 2, but we do have some significant benefits here. And we do have those at a lower cost, and the costs that we've estimated for this is $450 million dollars.

That comes with a great big star. This system has not been analyzed as the other systems, so our margin of error is larger than the other ones, but in gross numbers, we're looking at a lower cost. In fact, the performance of the system similarly is not as robust as the other ones are, so we do have a lower level of confidence in these numbers, but they're enough for discussion purposes.

MR. HILL: I'm not sure if I heard it right, but you said you're still going to have a three-month overflows here, is that due to the capacity of the conveyance system or the capacity of the treatment system?

MR. RAICHE: Conveyor system, yeah. This bump back here. So what we're doing essentially a near surface interceptor through here to the limit of our ability to do it, which I think was an eight foot diameter?

MR. HILL: It's ten foot.

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MR. RAICHE: It's a ten foot, which is even pushing the limit of what we could build on that. It's got a fairly shallow slope, so this thing only has a certain capacity, and it does get overwhelmed by the existing overflows.

MR. BRUECKNER: I just want to point out that what this alternative does is it doesn't do so well on high intensity storms because of the inability of the interceptor to bring that flow down. But in a way it performs better than the tunnel in a long duration, low intensity storm.

Because once you reach the tunnel capacity, that's it, you have overflows. You could probably pump out during the storm through the wet weather facilities, but there's not as much capacity as there would be with this. So when we have a long duration storm and the tanks fill up, you can continue to provide treatment through these tanks during the storm more so than with the tunnel.

So one of the things that we would want to look at this alternative on if we were going to continue it further for evaluation would be how does it do over the course of the

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year, because it may actually provide equivalent treatment for all of the flows over the course of the year. So while on the surface doesn't appear to be as good as the tunnel, and it's not in terms of storage for the high intensity storms, it may have some other benefits that are not apparent from this analysis.

And the reason for that is we just didn't have the time. We came up with this fairly late in the game. And trying to come up with an alternative for the tunnel was less expensive, so we just really quite haven't completed the analysis to the degree we would have liked for this.

MS. KARP: A question for either one of you. I can understand the limitation on the tunnel bringing this down. What if there was another tank on the Providence side of the Seekonk to pick up the 220. So you had the tank by 218 that captures some of it on the way to Bucklin. I guess I'm asking why constrain this to a single tank, because we could actually get more storage capturing treat.

MR. BRUECKNER: I can answer that. There is a second tank which is at 220. So that

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really is 2.7 million gallons, I think, which is less than the three-month storm, so for storage and then provide treatment for the remainder.
One of the problems with the storage options as you saw was that they were hard to site. They were difficult to operate at the distance and where they're remote it includes the hypochlorite stored on site. So that the time concept here is we can provide the storage at our plant. We have the site. We can put chlorine there, great location.
So that took away some of the disadvantages of near surface storage to then put another tank somewhere further upstream, we start running into the same problems we had which is where do you put it? And you've got the hypochlorite storage there, so it's conceivable that if we looked at this further, maybe that would be something that would be worthwhile to try and find a second site along the interceptor to reduce the problems associated with this. But that would also increase the cost for this because the tanks themselves are expensive.
MS. KARP: Can I offer someone

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else's property, because I did this once before?
MR. RAICHE: Sure.
MS. KARP: So there's the Riverside Cemetery, right, in Pawtucket, and I understand the Bay Commission actually extracting sand and gravel. That's what I was told by the owner of Riverside Cemetery. What I know is this basically is an abandoned quarry. It's right on the bank of the Seekonk, and it would be long right along the path of it. So I just would offer someone else's property here, but it looks to me like a pretty large vacant location that could be used for a tank. I live next to it. I wouldn't mind it.
MR. BRUECKNER: Okay. I'm not familiar with the site or the cemetery.
MR. LIBERTI: I think Tom alluded to it, but at the previous Stakeholder process, there was actually once it was narrowed down, there was an analysis of two annual years of precipitation where each storm was evaluated because some of these performed differently when they come to limitations, figuring out the tunnel let's say, and there was an accounting at the end by CSO of how many times it would

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overflow and what the volume would be. And it seems that that information would be important to select between these because you may find that due to hydraulic limitations there are lots of overflows that are untreated and don't make it into the interceptor or you might find there aren't as many as you suspect, so I didn't know if that was going to be part of this project before the board selects an alternative, or that's something you've already looked at?
MR. RAICHE: It's currently not in the plan to do that. It's something we could add.
MR. BRUECKNER: We know that when the alternative that we select, ultimately, we have to do that, we have to do the annual simulation and we're aware that we intend to do that, but this one, do we want to do the annual simulation, or are there other reasons why we might eliminate this alternative before we even get to that point, or might we be carrying forward two alternatives for evaluation to do this and particularly maybe look at some ways we might make it more effective. So this one is really kind of a tentative alternative that may

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make it to some further evaluation and analysis. So that's one of the reasons we're presenting it today. We want to get some feedback from you and this will also be presented to the board on Tuesday and get their feedback, as well. And it maybe that we may have to extend our analysis part of this program to do some further work on these. So that's kind of where we are. Maybe we'll carry it forward, maybe not, trying to get some feedback.
MR. BORDEN: I have a question about the tunnel versus no tunnel alternatives and whether the level of treatment is different versus -- I know bacteria is the main one, but is there a better treatment in terms of removing other parameters and pollutant in the tunnel in terms of what process is getting treated in here, in other words, addressing other pollutants?
MR. RAICHE: Yes.
MR. ANDERSON: Essentially, the tunnel is an abatement for a three-month storm, so you don't get any flow, so whatever is in the system is retained in the system. When you actually screen and disinfect the whole

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discharge, whatever it is, then yes, you're treating the bacteria, but there is the danger that you can transfer some other contents into the receiving waters.
However, in this instance, particularly this one, there is a tank. So in terms of most of the sewer systems around the world are designed on the first power flush, then the sendiment element will take place in the tank anyway, so the first 15 million gallons will take care of that. So it's only really the stormwater mix, if you like, that will be subject to the discharge.
So in terms of the water quality, it isn't as good as retaining it in the system, but it does generally take care of all of the constituents, as well as the bacteria.
MR. BRUECKNER: I just want to add a follow up. Any of the flow that's stored and then is pumped out of either the near surface storage tank or the tunnel, would get the level of treatment which is typically done in dry weather in the plant which at both of our facilities are secondary treatment with nitrogen removal, nitrogen removal during the summer

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months. And you'd probably get a little better bacterial kill. Usually our plants are down less than 10 MPN in dry weather. But the wet weather facilities, we think we can probably get to 40 MPN if they're located near the plant, so the bacterial levels will be a little bit higher, but in the scheme of total bacteria discharge, they're almost equivalent from a water quality standpoint, 40 versus 10 in receiving waters not much difference.
MR. DOMENICA: I have a question. With regard to the peak of the three-month storm and the problems with the capturing of that, I've noticed some cities are using what you might call green infrastructure on steroids. In other words, when you have a particular event that you're looking at as opposed to green infrastructure in general, they're looking at very aggressive stormwater management in revitalized, redeveloped downtown areas, detention primarily. Sometimes retention, but mostly detention to capture that peak.
And I'm wondering, along with as part of green infrastructure, open space, parks, stuff like that. Is that something that could

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be considered for this little problem of the three-month peak?
MR. ANDERSON: So, again, yes, the short answer is yes. The long answer, which I'll keep going until about 2 p.m. this afternoon about, is that it's very difficult, because as you've seen with all of these alternatives it's parallel phasing. So to get the green infrastructure in order to do what Mike wants it to do, we'd have to build all the green infrastructure first necessity of impacts of it and then come back and have you know, what was left was the residual. So yes, green infrastructure is very good at managing smaller storms. The problem is with some green infrastructure, and this is what we're finding with other areas and in other locations is that the capacity that's designed to remove the peak is taken too early in the storm. So the peak is actually not really effected. You can imagine, and you remember, I've talked to you endlessly about hydrograph over the last nine months. And if you think of a natural hydrograph that goes up comes up, you're not taking the bit at the top, you're taking the chunk at the front end.

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And you have to be careful that you don't do that. So really it's got to be the right blend. And so to say at this stage, yes, it would be an absolute guarantee that it would take the peak off would be overstating matters, I think. So we've got to say yes, green infrastructure has its benefits, we know about those, but the reality is in this instance when we're talking about the three-month storm and these interceptors and the conveyance, then it's going to make a very little dent in the actual peak flows, although, with reduced times. So it will have a positive benefit, but not necessarily be the answer to our question.
MR. DOMENICA: Thank you. Caroline?
MS. KARP: So I just want to make sure I understand what you're taking about. The city seems to have built a parklet outside the Brown University bookstore on Thayer Street. So it's a little bump outside of the sidewalk. So in one sense that could be green infrastructure, in once sense that could be -- it wasn't designed this way, but it could capture this sort of chronic overflow that occurs at the

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intersection of Meeting and Thayer and Olive and Thayer. Because that's down gradient in practice, a park lift could actually be designed as something with a detention basin even though it's not being designed that way. And so a message to the city would be these parklets are great, but maybe they ought to be designed partly to capture that first flow. Because right now what it does is it gets the flow which comes up over, and drops down. So I say that I'm not sure that gets examined in these structures. I think the city is doing a good job with building parklets, but maybe design to help capture storm flow as well.

MR. REITSMA: I'm not sure if I will be allowed to raise this question. The three-month storm. So maybe I should ask Angelo this question. And I know this is late in the game and maybe this is not fair, but at the same time, we're about to end our participation in this discussion, and this goes to the commission, and what have you, so we're talking about alternatives aimed at capturing the flow from a three-month storm based on data, if I'm not mistaken, that look at historical data that

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defined the three-month storm. What does that really mean?

MR. LIBERTI: I guess in the beginning we started talking about whether or not the three-month storm is something that meets the Clean Water Act. And on the surface, no, it is not by itself a magic storm that's been selected to meet the Clean Water Act. And ultimately, meeting the Clean Water Act in this instance means that you spent enough money to work towards substantial wise for economic harm. That's really what it comes down to with the CSOs. And what's being done around the country is the same thing we're doing here. We're looking at alternatives, we're picking something that we think goes as far as it goes with addressing the problem. But as bad as it sounds, you know, the goal of the Clean Water Act is to eliminate these overflows to the extent that you can.

So what we've been saying what we're doing here is to select something that we think is the right thing to do. And the final determination of whether more needs to be done isn't going to be made right now. Because to do

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that, we have to do what MWRA did, the only one in the country. It used attainability at the time of their CSO plan, sent that to EPA for approval and reset the water quality goal. And if we feel that we achieve that at the end of this process, it is still an option to package, whatever gets selected, send it to the state send it to EPA, and say we think that this plan shows that we met water quality standards and it's okay to continue to have overflows at larger storms. But we debated, you know, it may not be worth the legal battle and the legal effort of trying to get that determination. Maybe we should just implement the plan and address that down the road.

And that's really the reality of this issue. And as far as like climate change, one of the things that Tom Bruekner looked at early on, the design of the three-month storm that was selected back when we started the Stakeholder process, it appears that that was based on a limited amount of localized providence data. And that produced a more intense and a higher depth of rainfall than the latest projections using the more recent

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historic data for this region. So, I think Tom explained that they continue to use that design storm for this process. And my understanding is the reason that it continues to be higher than the most recent is because it was based on a more limited set of data. So Tom could jump in, but I think that thought was it's --

MR. REITSMA: I just want to respond to that, if I may.

MR. BRUECKNER: Well, before, Jan, let me just say a few other things. Back when we -- regarding the three-month storm, back when we were in the 1990s and trying to determine what we should design for, the EPA policy said that you had to reduce your overflows to four or less per year. So the three-month storm occurs four times a year. So that became the basis for selecting a storm, because everyone knew that you could not design a facility that would handle every storm in the year because it would be too expensive, which gets to the affordability issue. There was also a knee of the curb analysis done where you tried to determine the most cost-effective storm to design for, and that came out also to be the

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three-month storm. We then took the data that was available for rainfall at that time, which was the mid '90s and developed what was actually a synthetic storm does not really exist in nature, but it was determined based on intensity and amount of rainfall to fairly represent, based on statistics, something you would expect to see four times a year. In fact, in a real year you may never see it. And the reason for that was so that you could develop a volume about which you had to design your facilities for, particularly, if you were using storage, you needed to have a volume. You could take that storm, run it through your hydraulic model, and it would tell you for every overflow what amount of volume was coming out of that overflow. So if you were doing either a flow-through facility or a storage facility, you then knew what to design for.

Now, what's happened is everyone would like to build the facility bigger to capture more of the storm. In fact, we're required to do that, we're required to capture everything, but we know we can't afford to do that. And that's why Angelo says the real

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determinant now is the affordability criterion. So if we determine a three-month storm, we can afford to do it, we would build it. If we can determine that supposedly we need to build bigger than a three-month storm because affordability we can afford it, we should build bigger than for a three-month storm.

And with regard to the issue of what is the three-month storm now, it probably has changed. We have talked to NOAA. They're doing the analysis, as we mentioned, September of 2015 they're supposed to have the new projections for the new area, New England area, for three-month storms. Actually, I don't think they do a three-month storm, I think the storms they do are bigger. They're coming up with new projections. And we did talk to the state climatologist, and he has not done the projections, either. He has taken the most recent data, done a trend and determined that the average rainfall here has gone up steadily over the last 30 years. But we do not have projections going forward for what he predicts the rainfall will be, say, five or ten years from now. So that's where we are.

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MR. DOMENICA: Jan, I think you had a follow-up question.

MR. REITSMA: I have an observation. And on the latter, there are, in fact, projections for both coastal and in the precipitation and what that means in terms of flows and innovation, and what have you, and they will be available through RIGIS within weeks. I would ask that we all consider what we sound like to a layperson listening to this discussion. And I don't mean disrespect, but I think it sounds like gobble goo. I think we have an obligation to speak plain English. We're talking about a very expensive project. I think there is nobody in this room that want to make a project unnecessarily expensive, or unnecessarily doing things that, you know, perhaps we can do without, or perhaps we cannot afford.

But at the same time, we don't want to hide behind a lot of complicated language. We're talking about a project that's going to cost between anywhere from $450 to 800 and something million dollars. And it's maybe going to capture the flow from a storm that doesn't

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only happen, you know, once every three months, but -- or that used to be a one hundred year storm that's not happening more frequently, almost every year, a few times a year. We need to be very clear about that. I mean, we've been experiencing in the state those kinds of storms on a very regular basis, and it has created massive headaches around the state. And if we're designing a project that can't handle that, then we ought to be clear about it. I think we just really need to try to say is this is the design that is going to actually handle the kind of situation that we're facing more frequently than we have in the past, and that the more recent vetted data is telling us we're going to face more frequent.

And when this goes to the commission, I think we owe the commission a very plain English report on that. And if the choice is, well, is this because of affordability, so be it, but let's be clear about it. Because I'm not sure that it ultimately is maybe we ought to just, you know, once again, say well, is this really then the way to go, or do we need to consider another approach that can handle bigger

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flows in a more cost-effective way.
MR. DOMENICA: Before we -- a couple of more questions here, but one comment. It does sound like it's not lay language, however, it is the regulatory framework that Angelo and Dave Turin and Tom are talking about that. That is the regulatory framework. It's really two things: It's regular historic data, but it's also now compounded in complexity with climate change and sea level rising, and other things. So we have two things working in wet weather periods. It's very complex. But these are the critical things that the regulators are going to use to drive the decisions form a regulatory top down prospective on the project. So it is incumbent for us to make it simple, or clear. It's not going to be simple, but clear. But it is very tough, and it is real life.
MS. KARP: So it seems to me that, and I don't want to oversimplify things or dismissive of this conversation. But in a sense this whole planning situation is how do you design a tank or tunnel to either capture and store particular volume of water and it makes perfect sense to me to pick some statistically

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reasonable volume of water which is a three-month storm. So the climate projections is saying we're going to have three-month storms which is more frequently than three months. Well, in a way it's a big deal. If you size the pipe and the tank and the tunnel for a three-month storm, you're sizing it to a volume of water that's not being sized based on frequency of the storm, right? So in a sense we can stop calling it a three-month storm and just say here's the -- of water we're going to try to capture and treat. It may happen five times a year, it might start to happen more often than that. So I actually don't see anything problematic about that.
MR. REITSMA: It's the volume.
MS. KARP: Right, it's the volume we're sizing this, it's not frequency, so big deal.
MR. BISHOP: I think actually what Jan asked in a way goes in a lot of ways to the last alternative which I think recently emerged. So I don't know why we're meeting two weeks later, and I'm not sure lots of work and thinking has been done about a lot of things.

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But the points that were made about the last alternative is precisely that, that it's more open ended on the opportunity to provide some treatment for greater volumes. So it doesn't speak to doing that, because, you know, I can sit here and debate Jan, and so forth, about what the storms are going to be, and if I understand Tom correctly, the three-month storm they're using is actually aggressive, and that if they actually updated it with statistics most recently, it would go down.
So, you know, so I just think, the one thing that I do think and I said at the end of the last meeting, maybe I just said to Tom and I'll say it here is it appears that not this is the end of the process for the Stakeholders, but that there's some effort because of administrative timing and reality to take some of this work that's been done and present it to the NBC board which is the actual decisionmaker. I'm not sure that I'd be prepared at the end of today to sign on to a majority report of the Stakeholders choosing any one of these thing. I do feel the process has been a little bit kind of cookie cutter for us along the way, and we've

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thrown a few ideas in, but, you know, that feedback as a result, I think that feedback has resulted in like number 4, so I think there's been some effect. Maybe we don't get seven stars every month, but I don't see this as going away. And so in that sense, I actually support in a way what Jan says that all of this is a moving target, and when we're sitting here looking at a discreet plan that's going to be done in 2038 or 2042, or whatever, I wouldn't want to be in anything that's particularly inflexible when the actual dates of implementation we're talking about are that far off.
MR. RHODES: I'm wondering if it's possible for the consultant team to comment which of these options might be more scalable in the future should we see larger volumes of water on a more regular basis?
MR. RAICHE: I'm sorry. Could you repeat the question?
MR. RHODES: I'm wondering if you guys can comment on which of these two options might be more scalable in the future should we in fact see larger volumes of water on a more

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regular basis?
MR. ANDERSON: That's a slight misconception. Everybody thinks the tunnel is the end game, and that's it. Now, it's not, okay, it is a means of a large bath. It's all baths and pipes. You're absolutely right, Caroline. If I'd known that 20 years ago I'd become a financial advisor. The truth is, the reality is the tunnel is just a very large vacuum, you know, you can store in, but you can add to it in the future, you can build other things. There is no question. Just because it seemed to be a tank with an overflow that it will then take more flow, there is an infrastructure investment that would be required to transfer that. So ultimately they all have their limitations once they're built, but all of them are ultimately scaleable.
There are other techniques that come into play. What we're looking at at the moment is we've got 56 million gallons on this, and you rightly said this volume that we've got to deal with, so if we get away from the design storm discussion.
Now, that was chosen, and just to

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rewind a little bit before I go forward is that we always wondered where it would push against the affordability, so if you think we've got an affordability here and a volume that we've got to deal with. If they got to this kind of gap in the middle, then we need to do a bit more down here because we push it up to the affordability, and that goes to Tom's point. What we're saying here is in terms of the 56 million gallons we've got to deal with, we're looking at spending the least amount of money in order to retain as much as that as we possibly can. So all of them are ultimately scalable and truth. Some are structures which costs a lot of money and would struggle to be engineering the extended, but there's nothing to say you couldn't build another tunnel in the future. There's nothing to say that new treatment process will come out in 20 years time, so everything is scalable. This is just where we sit today, and with the probably that we've got in hand. If that somewhat answers your question.
MR. RHODES: Maybe I could try ask a different question. If I build an interceptor

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in a tank today, there's a certain amount of cost that I need to put in the interceptor, right. I find out in the future that that interceptor isn't providing enough volume, and that I really need a larger storage option i.e. tunnel. Have I wasted my money investing into an interceptor that I now have to provide a different alternative for. Or if I built a tunnel today, could I then at some point in the future add a tank at a later option if I then feel I need that.
MR. RAICHE: If it was one pipe and one tank then that would it be very difficult, but it isn't. And engineering wise, yes you could easily bypass it, you could build something new, you could upsize it, you could build it, dual it, sure, but they would all come with a cost. And there is -- I think Rich used the term earlier, a diminishing return. So there comes a point where you can continue to extend and extend and extend, but for every dollar you spend, you don't necessarily get the same return on that investment. So I would say everything is scalable, everything can be extended, but always it will be a diminishing

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return.
MR. DOMENICA: At that point here, we are past break time and move into a new segment, and we can all think about this discussion during the break. So we'll reconvene in 10 minutes. Thank you.
(RECESS)
MR. DOMENICA: Okay. We're back to Rich.
MR. RAICHE: Sure, so now we've introduced the plans to very little controversy, and I will compare them against one another.
First, in terms of CSO volumes and water quality. So, you know, just in summary again, the baseline gets us to 80 percent by 2023, and full reduction for the three-month storm, which is again our yardstick by 2025. Year 2025, we're looking at about 70 percent or 2023, rather, 70 percent capture with Alternative 1 and then phasing that last 30 percent capture out a number of years. The distinction between one and two there, you'll see how it effects the rate. There's definitely some benefits to phasing out that last 30 percent over time. Alternative 2 which is a

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timeline modification, again, helps rates in the early years, delays that 70 percent to capture to 2032, as opposed to 23, but does provide some treatment here in the interim and then phases out those last bits further out.
You know, interesting bit here to see is that as we go further out those last volumes that we're capturing are volumes that we're already treating from those previous interim projects. It's kind of hard to see our fourth alternative, which is sounding like its very popular. Maybe I should have moved it to the front. That it has, that the big benefit in here is that we're treating a large volume, but we are still leaving a very large volume untreated in that one. And we've got a time frame which lines up with Alternative 2.
MS. KARP: I just want to ask a question. So this is all based on capturing and/or treating 56 million gallons?
MR. RAICHE: Correct. That's our goal.
MS. KARP: So I want to know is the cost proportional to the volume. So if you were to design this for 70 million gallons, could we

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assume it would be approximately 15 percent more expensive?
MR. RAICHE: It is not that linear.
MS. KARP: It's not that simple.
MR. RAICHE: No. No.
MS. KARP: Because I think that's sort of a key issue here, is maybe we have the volume wrong, and maybe it's -- we ought to be redesigning over slightly larger volume, so I guess I'm missing something.
MR. RAICHE: Nick's answer right before our break on our, you know, our bathtubs and pipes. As I've discussed what seems like eons ago, we do have some conceptual ideas for optimization of this baseline plan. What we're presenting is sort of this robust plan. But we know that we've got some ideas some ideas that we need to vet out in preliminary design to be confident in them. One could in the preliminary design phase do that sort of sensitive analysis that you speak of, right. So, you know, we're saying right now that the tunnel diameter is 26 feet in diameter. We could do system optimization and get that tunnel size down to 24 feet, which would have a cost benefit. Or you

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could build the 26 foot and keep that system optimization or future proofing or designing around the different volumes.
MR. KARP: So may I ask the related question. The related question, and the two people that could answer are not here, unfortunately. But there has been this conversation going on about a stormwater utility. And so an important question is up front, how much stormwater flow could be removed from this system altogether by creating the stormwater utility that creates an incentive for property owners to increase pervious surfaces. And is it, say, even 10 million gallons or 5 million gallons? What percent of this?
MR. RAICHE: In essence, the evaluation that we did on GSI, on the green water infrastructure. And, you know, we have, conceptually volume that we could remove and dollars associated with that. The thing that we learned from the model is in isolation that's not going to solve a very large portion of the problem. It does need to be done in tandem with some gray infrastructure improvement to really see the benefits.

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MR. ANDERSON: Yeah, I think when we looked at this earlier on, a couple of meetings ago, we found that if we did the optimum GSI as much as we could, we could see up to a 36 percent reduction in total volume of CSOs. Now that's not stormwater, Caroline, that's just CSO reduction. In terms of stormwater volume, I don't have those numbers available.
MS. KARP: With those numbers, and that's actually important. Because we have impervious surface driveways and roads. And one of the things that I had asked the stormwater utility people to estimate is what percent of stormwater is generated on road surface, so that you get DOT to start thinking about stormwater abatement as a highway issue. And what portion of the stormwater abatement do you get by getting any property owner to look at the value of stormwater abatement on her or her property instead of getting NBC ratepayers to pay for it?
MR. ANDERSON: So we also looked at, if you remember, we did the public private. We split those two things out, and we looked at -- okay. So we looked at what GSI would sit in

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the public way, a more GSI may sit in private ownership. And the public way accounted for about 10 percent of CSO reduction.
MR. RAICHE: The caveat on that is that we did not include 95. We took out of that, we took out of that the RIDOT roads, the municipal rights of way.
MR. ANDERSON: But we also identified --
MR. BISHOP: I was just asking on that tempus point of order, or question, or whatever the heck it is. That 10 percent, do you mean 10 percent out of the 30 percent you identify, or do you mean 10 percent out of pervious surface, or impervious?
MR. ANDERSON: 10 percent in CSO actual reduction.
MR. BISHOP: Oh, and you had said that if you had done everything that you could go to 36, okay. Ten percent of what was public roads not counting that, I mean public roads not counting 95?
MR. ANDERSON: That's right.
MS. KARP: That's actually a huge difference.

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MR. ANDERSON: It is, but also, you've got to remember there's a cost associated with that, and not to go back to my earlier point too much, but the diminishing return means that there comes a point where green is way more expensive in terms of what you're having to implement, than what are some of the things that we're talking about. So in terms of NBC and what we're looking at under this project, there is a point where green actually tips over.
So a lot of the work Rich has done because we've done in together, but a lot of the work that we have done in this has looked at those alternatives incorporate the green, which we think is cost-effective to do.
MS. KARP: If I can --
MR. BRUECKNER: Excuse me, one second, Caroline. I know you'd like an update on it. I just talked to Sheila. She said she'd be willing to do it at the end of the presentation. I'd like to move on to the presentation so we can get through this, and then we could devote the end to the stormwater discussion.
MR. DOMENICA: Okay.

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MR. BRUECKNER: Because we could talk about stormwater for quite a while, and we won't be able to get through this.
MR. RAICHE: All right. So, if you recall back at the beginning, we have recalibrated the water quality model that was used in the previous CDRA development. And we have the results. And these are the results for post Phase 2. So essentially what is happening today versus post Phase 3, and this would be the full capture. So what we're talking about Alternatives I through III. The only difference between 1 and 3 being the day of compliance.
So water quality standards are a little difficult to interpret from these graphs because they use geomeans and percentiles which means you have to have a whole bunch of data. So an instantaneous look at what the concentrations are aren't all that indicative of where you'd wind up against it. But just in terms of understanding good versus bad. In terms of swimmable for contact, we want to be below the blue. So we want to be light blue or dark blue for your average sample, for your geomean sample. And in terms of the outliers

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they're like 10 percent of the time, you want to be below sort of the yellow color. In terms of shellfish, we've lost our shellfishery representative, very sad. In terms of shellfish, the limits are more strict. You know, we need to be in the light blue or the blue for the geomean or the upper percentile. So as we can see, this is day two.
Day one, when the storm actually happens, we don't actually have that things spilling. It doesn't get out of the system. It takes that first day for things to get out of the bay, so day two's sort of the interesting day to look at. So where we are right now, you can see out of the mouth of the Moshassuck, in the west we've got -- that's the west, that's the Moshassuck, and that's the Woonasquatucket. Out of that mouth of that confluence with the Woonasquatucket, we've got fairly lower concentrations coming right now. Phase 3 which eliminates 220 plus the residuals on the West River shows some improvement, but we still have some high concentrations. Obviously, with the concentration with the tunnel, we see right at the beginning of this storm that we're

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dramatically reducing concentrations in the upper bay, and the lower bay shows some improvement. On day three, you can see how the plumes continue on down, you know, large improvements in the large bay between Phase 2 and Phase 3.

On day 5, by the time we get down to Conimicut point where our shellfishing is of interest, see right now a post Phase 2, you know, we're in the violation area. But post Phase 3, south of this point, we're looking good.

And then as time steps on to day 7, you see by day 7 we're in the clear down past Conimicut Point and the central bay we're looking pretty good, as well. We're down to shell fishable and we're definitely within swimmable, whereas under current conditions of day 7, we are not.

MS. KARP: Can you just say what are the closures now?

MR. RAICHE: I couldn't speak to what the closures are. One other thing I did want to point out here, though, we've got day resolution here. You will notice that we kind

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of reach a limit here. What winds up happening is that there's the tidal (2x) influence, the title influence sort of traps the bacteria in the bay, and at that point the saltwater was kind of killing things off. The title influence sort of traps the bacteria in the bay, and then at that point the saltwater is what is killing things off.

MS. KARP: Is it a seven-day closure after a half inch storm? What is the closure? Because this isn't going to change. This still says you need closure after seven days?

MR. LIBERTI: So south of Conimicut Point there's three different criteria. The closest to Conimicut is half an inch, and then it's .8 inches in what's called conditional area A, conditional area B, one and a half. Thanks.

MS. KARP: One and a half inches?

MR. LIBERTI: Yes. And granted these are most useful for comparison purposes between alternatives, I think at this point --

MR. ANDERSON: Yes, I would say that that's exactly the spirit in which these should be read as in before and after the

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impacts. Because there's an awful lot of loading that goes into this that we've assumed in terms of background loadings, and, you know, just our general feeling that based on some water quality sampling but could go one way or the other. There would need to be much more in depth water quality receiving waters modeling done in order for us to get these numbers absolutely nailed on. But I think Angelo's right. If we can just concentrate on the before and after as a transference than that's probably about as much as we can gleam from today.

MR. RAICHE: Two other things to note. Where we've got the Pawtuxet coming in. We've got some water quality degradation that has nothing to do with the NBC/CSOs. And another thing to keep in mind. These Phase 3 for the three-month storm turns all of the CSOs off. So we're capturing in total volume for Phase 3. So what we're seeing here in terms of water quality impacts have nothing to do with CSOs at this point. That is background loadings, that's stormwater that's elicit connections to the drain systems. That's what we're seeing here.

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MR. BISHOP: And so just to understand, that's the baseline Phase 3 that you've modeled there?

MR. RAICHE: Correct. I mean, this Phase 3 is true for Alternatives I through III. The only difference between alternatives is the date that happens. Now, this plot just, you know, shows the comparison of these down at Conimicut Point and the difference between Phase 2 and Phase 3. And the up and downs that you see show that tidal influence as the tides push the plume back. And again, this underscores the fact that at this point Phase 3, we're entirely off. This is background stormwater loads that are coming in and loads from outside of the NBC service area. You know, the takeaways here is that the elimination of the CSOs do give us some considerable benefits here in terms of water quality improvements.

MR. LIBERTI: I'm sorry, I should know this. But the depth of the design storm to put it into context of the entire closure?

MR. ANDERSON: 1.65 inches.

MR. LIBERTI: 1.65, so when you're looking at those if you believe these to be

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accurate model predictions, when they say we're starting to see a violation of 14, that's at 1.65 versus .5 for the area closest to Conimicut.
MR. BRUECKNER: .8 inches, Angelo.
MR. LIBERTI: Oh .8, sorry.
MR. UVA: .8 inches for conditional area A, and this is all a result of Phase 1 of the CSO and results in water quality and shellfishing areas. .8 closes conditional area A, one and a half inches of rain closes conditional area B. That's for a week. Our monitoring shows that is cleaned up within five days and could reopen, but as a safety factor, DEM 7 keeps it closed for 7 days.
MR. RAICHE: Now, what we have here is the model results for post Phase 2, which is our current conditions and post Phase 3, which is the full blown thing. What would have been lovely to show you were some model results that allow us to analyze these different options against each other, including some of those interim benefits, right. So the big difference between Alternative 2 and Alternative 3, is when you build the tunnel and capture that 70

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percent. And then the big difference with Alternative 4 is it's entirely a different paradigm.
I'm hesitant to put this graph up because this is -- and we found some anomalies in the output data based on some of the input data for the water quality model. We're rerunning the water quality model as we speak, and we should have updated data. We've got these graphs for throughout the bay. This down at Conimicut Point, the anomalies in the model have to do with where individual CSOs are loaded. So in general by the time we get down this far south probably doesn't make that much difference, but there is a big star on that. This is a provisional data that we know needs to be revised. But in general, if there isn't a large shift in the model outputs, this does allow us to take a look at those conditions, allow us to understand, particularly the difference between Alternative 2, which sequences the tunnel early and Alternative 3 which sequences it late, and then 4 which is treatment based.
MR. BISHOP: To the extent that

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this is one relevant criterion for priorities going forward, I'd be interested with the kind of questions and information that Tom provided in seeing that graph for these lesser storms, comparing the current inevitable result to Phase 2 to Phase 3. Because while we're looking at whether or not we can get no closures, again, in the infamous three-month storm, I think it would very interesting on how many closures might be reduced by the orange or green lines in lesser storms, even know which is not regarding the, you know, the administrative necessities of what we do, but just the practical ideas of how much more shellfishing would you get if you did one of those lessor alternatives.
MR. ANDERSON: I think that's a very valid point, Brian, to tell you the truth. But where we're at the moment is we're comparing alternatives. And what we've got to do in order to do what you want to do is a heck of a lot more of, you know, concentrated than what we've currently done.
But again, just in the spirit of comparison so that you get a feel for what these alternatives, because you've heard all about the

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engineering, you're going to hear all about the costs, but there is a third wheel on this and that's the water quality. So that's an indicator to what you can expect. And I don't think it's too much of a leap into the unknown to say that what you're saying here will be translated into those smaller storms, although, granted there would be variants.
MS. KARP: Can I just say. I may be interpreting this graph improperly. If I understand that this suggests that Alternative 4, and the tunnel are actually somewhat close in terms of fecal coliform for a hundred mils, so it's a difference about -- and for these are in log units either, so there's a difference of about 25 fecal coliform, a hundred mil to build a tunnel. There's an orange curve that's the tunnel only, and but Alternative 4, actually gets reduction that looks close to that -- am I correct?
MR. RAICHE: Yes, and one thing to put into the mix on that is that the Alternative 4, in its entirety, and the tunnel by itself in terms of cost aren't that far off from each other, right. So this is Alternative 4 in its

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entirety, which includes, you know, a tank, some disinfection stuff, some very large interceptors. And then the orange is just the tunnel. You've got, you know, some additional stuff to build. In terms of cost, if you think, you know, just the tunnel versus all of Alternative 4, it's interesting that the cost and the benefits are in the ballpark of each other.

MS. SCOTT: So I guess all of these evaluations -- well, thus far have been with Conimicut Point as a point of analysis, and I'm just curious. You all consider all the waters as dealing with Narragansett Bay, but those of us who are working in this field, consider it's the Seekonk River and the Providence River, and then upward near Narragansett Bay beginning at Conimicut Point. So all of the CSO projects to date have really focused on the Woonasquatucket and the Providence River. There's been minimal work done on the Seekonk portion in this area. So I'm just curious whether there's been any evaluation on the phasing of these different alternatives relative to improvements to, say, the Seekonk. Because right now, again, the

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Seekonk hasn't really seen any of the, you know, the benefits as we've seen in the lower significant combined of the benefits in the lower Providence River.

MR. RAICHE: If you look at those reaches on the Phase 2 versus Phase 3, you can clearly see what all of Phase 3 does. The anomalies in the model that we have. We've got what model runs that will give us that distinction on just the tunnel versus the other pieces. The anomalies effect these graphs and these outputs for that finite distinction so I can't show those ones. In terms of moving Phase 2 to full Phase 3, Alternatives I through III, we can illustrate that.

MS. SCOTT: Right, so my question really is within the Phase 3 Alternatives, you have, you know, four alternatives you're looking at that are phased, you know, anywhere from however many years they span. It seems like one of, an important point of information in making a decision of what are the benefits going to be seeing over the course of whichever alternative is chosen is where we're going to see improvements in water quality in the receiving

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waters in this area over the time span of these different alternatives. It seems to be one point of information that could be insightful.

MR. RAICHE: And we're hoping to have the water quality runs done. We've got to check in with them tomorrow. I think it will be overly ambitious to say we're going to have that data by Tuesday. I think we're looking later next week before we have that data two-speed to a level of confidence this time around, but it's in the works. Again, we're pointing out here that the tunnel alone gets us a good way there that the remainder of Phase 3 does quite a bit more, and that the tunnel by itself and all of Phase 4 are somewhat analogous to each other. Again, this is just one snapshot of this particular storm volume. Maybe we stop calling it a storm, just arbitrary volume.

Now, putting the cost, the cumulative cost side by side, this is just sort of a retailing of where we have the previous graphs. The Alternative 1, which is the baseline, jumps out to some earlier costs and completes in 2025, and we had no additional capital costs after that

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Alternative 2 Phases that out slightly longer. And again, we're seeing what we're calling Alternative 2 we're carrying some additional costs to be on the conservative side here. We do feel as though this can be shaved off to at least match Alternative 1, if not improve upon it. Alternative 3, again, we defer costs for a substantial amount of time, but then line up with Alternative 2 in 2030, which is just before the tunnel goes on-line, so essentially you're spending some money and you're deferring that cost and we're showing that at 2030 at the moment, and then the Alternative 2 costs do jump up in excess, Alternative 3, pardon me, jump up in access of Alternative 2 because again, we're including those interim projects, the treatment and disinfection options that are sort of premiums on here. That's what we're spending money up here to get some early water quality benefits. And then finally Alternative 4, it's phased out, as Tom pointed out, to have some evenness, some incremental increases through what we've chosen as that period through 2038, and then flattens out.

This time around we did on the rate

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analysis include a couple of other financing options. The previous time our financing assumptions would be that we would get $25 million from the SRF program, and that would be financed over 25 years at 2.5 interest. That the remainder of anything that needs to be spent in that year on the systems would then be put on a bond for 20 years at 5 percent. These are fairly conservative financial assumptions.

A new alternative is maintaining that SRF assumption by saying that the commercial bonds would be 30 years at 5 percent. And would also wrap the debt essentially for the first 10 years it would be interest only on those loan payments, and then start chipping away at the principal. And a third alternative is 30-30 saying that same commercial bond assumption but saying that the SRF program could be financed at 30 years at 3.3 percent.

So this is what it looks like for Alternative 2 with the red line being that first conservative assumption of 2020, the blue line being SRF for 20 years and bonds at 30 years, and then the final one, a 30-30. There isn't that much of a difference, because we're capping

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the availability of the SRF program at that first 25 million, that there is on an annual basis there isn't that much of a difference.

The only difference you're seeing there is your annual payments are lower because you've got a 30 year versus a 20 year. But it does show that once we're getting into some big spends here, we do keep rates lower by doing the more, the longer financing. The SRF at 20 and the bonds at 30 is a fairly commonplace way to actually finance these, and we're confident that we could get those sort of finance terms. So because we're showing that there's a benefit to the rates and a little bit more of a smoothing out of necessary rate increases for analyzing the alternatives against each other we use the 20-30 as our case. Because we have to have another extra hour if I had three slides for every single one of the options.

So in terms of the presented bills and this graph is shifting to our four alternatives. The baseline not surprisingly because we're spending a lot of money upfront jumps the bills up very quickly to a very high level. I think it's -- it's above 800. I got a

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table later which I'll show you exactly what it is. The Alternative 2, which still gets us, you know, at this point we're building the tunnel and we're getting to that 70 percent capture, but then spacing out the interceptors, the 220 solution and the West River Interceptor and sewer separation in Providence, give us a much more gradual increase in the overall bills, and then line up, you know, in 2030, '31, close to the end of the program, but still overall bills are lower. Not surprisingly Alternative 3 which delays the tunnel, keeps rates low until you have to start building the tunnel and then jump up. It's essentially taking this jump and pushing it out however many years you delay the tunnel.

And then we've got projects out here that don't require rate increases. Those are the interceptors and sewer separation. Largely it's because you've raised your rates so much through that phase that you're generating enough cash to pay for those smaller programs until Alternative 3 phased the stub tunnel for 220 at the very end, and so we catch up to Alternative 1 at the end of the program.

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Alternative 4 just as we laid it out and anticipate by design, we have steady rate increases to pay for the smaller projects and levelling out at the end of that program.

MR. BISHOP: My question is quick. Again, which is to the possibility of seeing this information in the context of earlier and even present increases related to the cost of Phase 1 and Phase 2. That would give us a sense of what of the bill that is being paid at $500 already represents an investment by the ratepayers in the earlier CSO work.

MR. RAICHE: To break out the Phase 1 from all.

MR. BISHOP: I'd like two more other colored lines that show maybe Phase 1 and Phase 2, back it up a little, extend the graph down a little so we can understand what are the base costs of running the sewer versus the costs that are devoted to CSO.

MR. DOMENICA: Do you understand that, Rich?

MR. RAICHE: I understand the question. We don't have the historical data on rates because our mission was to look forward

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not backward.
MR. BISHOP: I have a couple of bills. I'll bring them down.
MR. BRUECKNER: I think it might have been presented in previous slides last meeting by Greg. I think he did show the bond indebtness that we're currently carrying.
MR. RAICHE: That's not exactly what Brian's asking, though.
MR. BISHOP: I don't think it would be too hard to do. I'm not asking for precise to the penny. I'm just looking for that -- that's very graphically informing.
MR. RAICHE: I don't know if we can necessarily --
MR. BISHOP: I mean, I don't mean right away, I mean if you're going to show it to the commissioners, I assume they might be interested.
MR. DOMENICA: Rich, isn't this where you're starting from here?
MR. RAICHE: We're starting in 2015/2016, actually. This initial jump has nothing to do with Phase 3. This initial jump is a remainder of Phase 2 project, plus some

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work at the treatment plant.
MR. ANDERSON: So what's the number that Brian is asking for?
MR. RAICHE: To go backwards from there.
MR. BISHOP: And of course that conflates treatment plant, and so forth. You know, we've spent a lot of money on CSOs, I think it's an optic or interesting issue to say how much of the bill people are paying at around five hundred bucks is related to what we've already done.
MS. KARP: I guess I have a more simple minded question. If I understand this right, these are bills per year, right, this is the bill per year, so at $800 a year versus paying 67 --
MR. RAICHE: Average household, yeah.
MS. KARP: So we're basically, if I understand this graph right, maybe I don't. Is that basically an average household is paying something like less than $35 a month for sewer to the Bay Commission, and we're talking about doubling that by 2011. I might have

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misunderstood something, we went from 35 to 67 dollars a month? That's what it says.
MR. RAICHE: Don't ask me to divide these numbers by 12.
MS. KARP: That is what it is. It's $67 a month. We're saving $800 a year. So I guess -- I'll leave this as people keep talking about affordability, but I don't really understand what we're talking about. If the current bill is $37 a month, am I right or am I misunderstanding something?
MR. BRUECKNER: The current bill is about $450 a year, and in the year, I can't read the numbers, 2024, so the number is going to go up to $812 a year.
MS. KARP: So $67. So you and other time you used this in 1998, which is people spent more than that on their Smart phone, they spent more than that on their cable TV. As we think about affordability, I think that ought to be factored in.
MR. GADON: Tom, what percentage of the rate is going to the debt service now?
MR. BRUECKNER: I don't know. I'd have to ask. Karen, do you know?

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MS. GIEBINK: 66 percent.
MR. BRUECKNER: She said debt service and debt service coverage.
MR. TURIN: I think this is an interesting conversation, just to maybe further be informed on this. Are these projected numbers based on the actual bills, you know, actual billed usage, or are these based on kind of a literature assumption of what the average household uses?
MR. BRUECKNER: I think that they use a hundred and fifty gallons per day when Greg was doing his numbers. For the average household was hundred fifty gallons a day. And that was based on actual use in the district.
MR. HILL: I just had a quick, you know, maybe another line added to the average bill here. What is the existing assuming that none of these were ever completed? What would it look like on an average bill basis? I think that that's maybe part of the question.
MR. RAICHE: Do you mean with the CSO CIP stripped out?
MR. HILL: I'm just saying what would the average bills be projected out over

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the same time period of -- capital (Inaudible).
MR. RAICHE: We actually have the capital improvements, like at the plant and in the interceptors things like that that have to happen too. We could strip out that. I mean, it would essentially just be some small creeping, you know, down around the five-hundred-dollar range, maybe a little bit more.
MR. HILL: As some of that debt falls off --
MR. RAICHE: Again, the debt really doesn't start falling off until like 2040. So, really, for the entire life span of what we're calling more of these alternatives with the exception of Alternative 3, you're not going to see anything.
Moreover, you know, it is very difficult to say with a straight face that by 2040 there isn't going to be some other capital expense that you need to do. I mean, it would be awesome if the plants could operate without any additional capital expenses, but I think there's going to be some other debt somewhere.

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MR. HILL: I think that was a question I had was when the debt was going to fall off.
MR. RAICHE: Karen, I don't know if you're -- my feeling is that it's in 2040, or so.
MS. GIEBINK: The rates are going down.
MR. HAMBLETT: On Caroline's question about rates. Can these folks at NBC tell me how NBC rates today compared to rates being paid in the other municipalities around the state? Is NBC in the average high, low currently?
MS. GIEBINK: I don't have all that information with me today, but we do have those surveys included in our budget documents, and we're around the middle of the pack in terms of the national average again. I think one of the factors that come into play is the overall declining consumption, and I think a lot of these fee comparisons are based on a higher usage than currently is in place across the states.
MR. HAMBLETT: Because I do think

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when you see the number 800 per year, it's a shock if you think of it in today's terms, but like most everything else in life, this is, costs tend to go up over time. So I think everyone should take a good sober look at that. The another question is, I don't know how the Bay Commission manages the bills for folks who are struggling economically. How is that managed, if managed at all, and how would that be factored into increased costs?
MS. GIEBINK: We do have not have any special rate for someone that is on a fixed income or low income or elderly. It's the same rate for all of our users in our service district.
MS. KARP: So there's this situation in Detroit right now, which probably some of you are following where the City of Detroit department shut off water for delinquent (inaudible). Do you ever shut down for stop treating sewage? What happens if somebody fails to pay their bills?
MS. GIEBINK: Well, we have lien sale power, and in addition we also have water termination procedures, and we work with the

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various water suppliers to terminate water service.
MS. KARP: Property owners. Usually (inaudible). Okay.
MR. SCHILABBA: NBC's 2014 Annual Report, they do have, at least for Rhode Island, annual residential sewer charges by town or by sewer entity. NBC lists its average residential annual bill of $521. It's based upon an annual usage of 97.6 HCF. And I know there's been a lot of questions about what the annual bill is, and they did provide that in their 2014 Annual Report. And that is, it's just, I would say just at the bottom of the top third of the presented entities.
MR. BISHOP: And perhaps it's the apparent present bill is lower here because you're dealing with 2018 dolars maybe?
MR. RAICHE: These ones are 2015 dollars.
MR. BISHOP: There's a modest discrepancy between that report and the depicted annual bill. But I think, I mean, look, one important point is that, you know, you add up -- I forget how many customer, we have 50,000, or

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something. I mean, you add up that many 35 dollars a month, and, you no, you're talking a little bit more than chump change, and I don't think any utility would come to the floor suggesting that its rates were going to double in a span of 10 years without a lot of pushback. You know, regardless of what value one places on the services or the causes of those increases.

MS. GIEBINK: I'd just like to add the difference between this figure and the figure that was sited by Mr. Schilabba is the assumption of the gallons per day consumption, and I believe that MWH, their study was based upon actual usage and we've kind of been using industry standard of 200 gallons per day. So that number that you see on the screen would be more representative of the average homeowners annual bill.

MR. HAMBLETT: I also want to add that the Rhode Island, the citizens of Rhode Island are also have been paying or helping to pay for everything that's been done to date, and we'll be helping to pay going forward through the passage of bond referenda. So I would add to everyone else's bill around the state the

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cost we are all incurring to support these projects around the state.

MR. DOMENICA: Is this Clean Water Act program including stormwater residuals?

MR. RAICHE: No, this is just Narragansett Bay bills. So this is everything that operates the two treatment plants, the existing interceptor system, the remainder of Phase 2, and this is Phase 3.

MR. DOMENICA: So you'd have to add in the municipality bills to this?

MR. RAICHE: Correct. And I'll show an example in terms of affordability.

MR. DOMENICA: And would those -- the impacts of stormwater management?

MR. RAICHE: When we get to the affordability slide for the City of Providence, yes.

MR. GADON: Rich, when you make your presentation to the commission, I would suggest you put a rate for monthly bills as Carolyn referred.

MR. REITSMA: I can wait if you need to finish your presentation.

MR. RAICHE: No, there's still some

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information. When we get through a couple of things, we'll continue. Okay. So in terms of increases, annual increases, we've got a couple of increases that are expected in 2015 and 2016. And again, this is for a leftover Phase 2 stuff and some work at the treatment plant. It has nothing to do with Phase 3.

And then the following two years, all of them have sort of small expenses because this is where we're in preliminary design, and design is comparatively not much money. And then in 2019 you see that Alternatives 1 and 2 put the tunnel up front, jump up with high increases initially, whereas Alternatives 2 or 3, rather, keep the rates low until the tunnel hits. Four sort of has an average sort of creeping here, little irregularity, you know, when you go between design and construction, but relatively low.

And we do have those last bumps for Alternative 3, as well. So in terms of rate stabilization year-to-year changes forgets, you know, gets you there. Alternative 1 has some initial pain and then is over once you build it. Two has some initial pain and then sort of more

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steady creeping, and then you're done.

MS. KARP: So when we see the peaks in years 2020, and so on. Say with Alternative 1, does the rate then stay constant after that so it peaks early and then stays high?

MR. RAICHE: Yes. Because you've then incurred that debt, and you have to start paying off that debt. You have to have the rate increase to have the additional cash to get the bond and SRF. But that's also why, you know, you're having some additional projects come on-line in Alternative 2, but you've already raised rates so much that those projects are smaller by means of comparison are smaller, so you don't have to have large rates after that.

These are the affordability graphs. These are the things that Greg has gone through in the past. And the Clean Water Act threshold for affordability is that 2 percent. So if we look district wide, this is taking those bills and dividing by the median household income. And we see that Alternative 1, the fast one gets up to 1.8, doesn't quite get to the limit of affordability district wide.

Alternative 2, shows, you know, 2

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percentage point improvement over that. Alternative 3, you know, keeps rates relatively affordable until you build the tunnel and then you pretty much catch up to where Alternative 1 is. So again, the big difference between 2 and 3 is when do you want that big water quality gain, and when do you want to pay for it? And Alternative 4, keeps things relatively lower.

MR. RHODES: Could you just refresh my memory as to what the total cost of each of the alternatives is?

MR. RAICHE: The total cost for one is $750. Two, we're carrying for this affordability analysis, $810. But we're fairly confident we can reduce that, but we're showing our worst case. Three is $925. That could also be reduced by some of those same engineering ideas, and then four is $450.

MR. COUTO: Could you explain how are the rates lower for some of these capital projects that are apparently higher than --

MR. RAICHE: It has to do with the rate increases and when you have to bring in the bond. So, essentially, to be, you know, kind of simplistic about it. Here, you've raised rates

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here, and your rates are at a high level. The money that you're bringing in through this span is enough to pay for those additional projects that you're doing. And so it's over a longer span of time.

So you're collecting those annual bills at a higher rate and you can pay for the projects. And then you don't have to do necessarily a rate increase because your incoming cash has been higher over a long time period.

MR. DOMENICA: These lines are all Clean Water Act programs, both NBC?

MR. RAICHE: Yes, these lines right here are just NBC commitments. So it's the treatment plant, the interceptors, and the CSO programs. This does not have any MS4 element to it, or upgrades to the collection systems.

MR. DOMENICA: But anything that the towns charge for --

MR. RAICHE: It's coming up in three or four slides.

MR. SCIALABBA: A question just to make sure I understand this. I wasn't at the last meeting. Does this say that the 2 percent

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affordability sort of benchmark is never exceeded under this presentation?

MR. RAICHE: As Mike points out, it is not in the qualifiers is that this is district wide and it only is accounting for NBC's costs.

MR. SCIALABBA: Okay. And in what was presented last time where there were a number of customers who went over that benchmark, that was a different analysis that included- -

MR. RAICHE: We'll get to that in a second.

MR. GERRITT: I just question this whole graph because it's based on economic assumptions that I think are fantasy.

MR. RAICHE: These are the economic assumptions that are in the EPA guidance for the affordability. So these are the rules by which we are playing, as Mike had pointed out before.

MR. GERRITT: What they're saying is you expect people's incomes to go up because the rates and the sewer rates aren't going down, but the percentage of income being used to pay for it. And I think that those assumptions

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about where the economy are going are seriously fantasy.

MR. RAICHE: So these are the -- in terms of what this looks like, you know, sort of geospatially where we've got stressed areas. You know, this is 2015, so this is before we embark upon any Phase 3 work at all, and again that, you know, the numbers that we're showing are district wide, and you can see that most of the affordability are around the towns that surround the three cities, and that we've got census tracts within Providence, Pawtucket, and Central Falls that are currently having affordability issues.

So if you look at, you know, number of households that are already above the 2 percent threshold, district wide it's 45, or the entire service area is 45,000. Number of households in Providence is 22,000, Pawtucket eight, and Central Falls just under three.

MR. DOMENICA: How many slides do you have left, Rich?

MR. RAICHE: If I went one a minute, I would still be four minutes over.

MR. DOMENICA: Let's let him finish

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and then have discussion. We'll still be over time if we let him finish. So let's let him finish, and then we'll consolidate the questions when he's done.

MR. RAICHE: So in terms of, you know, of what these look like if you benchmark them against each other at the peak of that affordability graph. Each alternative has a worst year. And the worst year for Alternative 1 is right after you've finished the program in 2025 and 2026. So you see, we've got a large portion of Providence, Pawtucket, and all of Central Falls past that affordability limit.

You know, we've got 29,000 or 13,000 and 3,700 in Providence, Pawtucket and Central Falls respectively. For Alternative 2, the worst case here is 2031. And we see some moderate increase in the number of household here. So we're at 20 -- that number can't be right. Let's ignore that number. That can't be right. In terms of the percentage for Alternative 2, percentage of households that go over the affordability limit for the service area wide, we're in the high 30s throughout the duration of Alternative 2.

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For Providence we're getting close. We're in the mid 40s, and Pawtucket we're in the high 30s. Central Falls is the one community that has the affordability issues throughout Phase 3 for Alternative 2.

For Alternative 3, we have a worse case in 31. This isn't vastly different. That must be the numbers that I need for that other slide. There isn't a vast difference between 2 and 3, it's just the year in which you hit that affordability limit.

And again, we're in 50, in the high 40s and a 51 percent for Central Falls. And the worse case year 41 percent for Providence and 38 percent for Pawtucket. So the worse case, if you're looking at the worse case year, 2 and 3 aren't vastly different. What's different is the sort of short-term affordability.

And Alternative 4 we have an improvement over 2 and 3 and 1. But we're still pushing some affordability issues for some census districts in the cities.

Now, as a couple of people have pointed out, those were if you just consider NBC costs. There are clean water commitments that

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the cities also have in addition to that. So if you want to look at that versus the 2 percent affordability, the most telling case of three cities is Providence. It has the large population for one thing, it also has the largest system.

Central Falls is already sort of unaffordable on its own, but it also has a small system. So adding their commitments doesn't radically change this graph for Central Falls. But if you look at just Providence. So if we just consider the NBC costs for the City of Providence, you'll see that Alternative 1, which does everything quickly, does tip the overall program over the 2 percent affordability.

Alternative 2 keeps it just under the 2 percent, and Alternatives 3 and 4 keep it lower still. I might have misspoken. This doesn't add in, the next line does. The previous slide showed just NBC costs and area wide. This is just NBC costs for the City of Providence, which has a lower income level than the entire service district.

So just NBC costs show Alternative 1 has affordability issues, the other two and

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three don't when we add in the other Clean Water Act commitments that we project will need to happen. Now keep in mind, what we assumed here is not what the City of Providence is currently spending.

What we did is go through an exercise and look at the size of the City of Providence's sanitary combined and stormwater systems, look at how old they were. And based on the fact that in the next 40 years they are going to need to do some significant improvements to those systems estimated what those costs are. So adding them in, we see that all four of our alternatives cross the threshold for the City of Providence.

MS. KARP: I just want to clarify a couple of things. One is that these costs, the affordability analysis is based on household and often sewer bills don't go out by household in multi family units, they go to the property owner, right. So there is a way in which even though you get a high proportion of people with low incomes in say Central Falls, the people that are making money are property owners and those are also know as absentee owners. So

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increasing their bills is a different matter. So I think there's a correction on the affordability analysis there and then. You're showing 2 percent of current income? So as you take this out 2015, are you assuming people's income remain static, so that when you say it exceeds two and a half, it exceeds two and a half percent?

MR. RAICHE: And again, this is the EPA methodology and assumptions, but that is why you see the tailing off while bills peak. It assumes that MHI increases index to inflation, or assumed inflation.

MR. KARP: Then just say this is my way's if incomes increase this can still be less than 2 percent?

MR. RAICHE: If net increases over this period of time.

MR. DOMENICA: Let me clarify. This doesn't or does include the increase the median household?

MR. RAICHE: It does. Once you get here where your rate increases, stop, and you're not increasing bills anymore, that's why the affordability tails off because it assumes that

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MHI increases with inflation on an assumed rate.

MR. DOMENICA: Let's finish because I think you have a few slides left.

MR. RAICHE: So to bring all of that into one massively confusing table, we had several different, you know, numbers to consider. We've got total cost, and we've talked about what the total costs for each one of the alternative plans is.

We've got rates sort of over time, right, so the first 10 years, the second 10 years and then, you know, an additional 12, and how they compare to each other. And you can see that the total top out of 2 and 3, you know, is around the same dollar. It just happens in a different year.

And the same thing when we talk about volume captured. You know, 2 and 3 are similars, but just different years in which you hit it. You know, the baseline does everything quickly, 2 and 3 delay those benefits. And then 4 is a different animal. So we get a smaller percentage capture, but we also are acknowledging that we've got a volume that we're treating. So it's not exactly an apples to

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bananas comparison, but we've got some metric there in our year of compliance.

So in terms of trying to have a table that is less confusing while still admittedly confusing in its own, this one base, or compares them all to the baseline to Alternative 1 and how they differ, right. So in terms of total cost, you know, we've got a range for these because we know we can value, engineer them, but the no tunnel we're sure is around 40 percent less.

In terms of the rates, all of the three alternatives are lower than the fast Alternative 1. And we just have the difference in how much and when it happens in terms of the volume captured, we can see that over time and then how long the ultimate compliance is. So this in encapsulates is the difference between the four alternatives. And that's my last slide.

MR. DOMENICA: Excuse me -- the NA at the bottom right is due to that peak of the three-month storm.

MR. RAICHE: Well, the NA at the bottom right is because this is an entirely

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different design criteria. One, two and three captures our arbitrary volume of the three-month storm that we ave called compliance. Alternative 4 never captures that volume, it does something else.

MR. DANIELS: On that point, how much better is it and I'm a non water quality person, to capture versus treatment and discharge? I mean, what's the difference in terms of water quality?

MR. RAICHE: Correct.

MR. LIBERTI: Oh, sure. It went so good the last time. I'll try. I guess I'll go back to my original comment about, yes, picking a volume in order to size some things and do some comparisons needed to be done. Personally,.

I think the rubber hits the road when you'd look at real life, what happens day-by-day by-day for a year. And that's what was done in the first Stakeholder process. When you got to this point and you needed to pick between them to really see which one does better, I think you'd need to run it through that each year for a couple of representative

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years. And if you want to take a stab at climate change, increase the intensity by 20 percent, throw in one or two more intense storms in a particular month. You know, you could do things like that to exercise these options and get an idea of, you know, what railroad the benefits.

Because some may continue to have more overflows on a part of the Blackstone or a part of the Seekonk. You know, others -- you know, generally, though, capturing allows you to slowly bleed it into the treatment plant and give it the full amount of treatment that you have available. Well, in this case it's nitrogen removal at both facilities. So on the surface it appears that any time you capture it, it's preferable to a higher rate treatment to where the disinfection act is questionable. But.

I think you really need to look at the next step if you're seriously considering, you know, the high rate treatment, the no tunnel option. And you have the water quality model to also get an idea of phasing these things where you do in the interim. Do you get a real

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benefit or do you get a volume reduction where you have limited benefits. But it gives you some idea to explore what you anticipate the benefits to be of these projects. And just picking one storm, I don't think really tells you what the expected benefits are.

MR. DOMENICA: And what you're saying, Angelo, when you say benefits, you mean increase days below the shellfishing criteria or increase days below the fishable, swimmable criteria in the water body?

MR. LIBERTI: Right. So it could be the recreational contact in the Seekonk River.

MR. DOMENICA: How many more days --

MR. LIBERTI: Many more days could you safely row jet skis and meet our swimming criteria. There's a lot of focus on urban beaches right now in East Providence, and other areas of Providence River. And then, of course, you know, shellfishing. Ultimately, I think there's a question could this shellfishing line be moved north of Conimicut with the implementation -- it's not a goal in our current

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standards, but it's not impossible either. There's some issues that we need to look at.

MR. REITSMA: Thanks Angelo, I think that was a helpful restatement. I think, and also going back to when Alternative 4 was introduced, you talked about this is an entirely different paradigm, which perhaps you shouldn't have said because they got me going. Because I think that we should be thinking perhaps about a different paradigm.

And I want to be careful because when I do it, I give Brian all kinds of ideas that I'm not sure I should be doing. But we're looking at alternatives that try to do things that are not possible, capturing more flow than we can actually handle.

Angelo just makes clear that the more we can capture so that we can actually provide for treatment, the better it is. All the fancy hard solutions don't seem to get us there either because technically it's not really possible or economically it's not going to be possible. We keep dancing around the green infrastructure piece, but it seems to me that the new paradigm is actually are there options

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to capture the flow and detain it so that you can treat it appropriately? And shouldn't we, and I'm not actually going to ask the question because it's going to take more time than we have.

I'm going to propose that a few of us form a working group with the cities involved in this particular project to do an investigation very quickly, whether it's possible to use some of these millions to acquire places where you can create storage capacity, and maybe have win, win solutions so you can have parks there or playing fields, or wetlands where you can have that storage capacity and delay the treatment to the appropriate time and save probably a fair amount of money.

It seems to me that you're talking about a budget that is many times the public land budget that we currently have in the state, and we have a huge need in these particular communities for certain public amenities that could be served at the same time. This is being done elsewhere in the country as a way to do it where you get multiple benefits out of a

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relatively modestly investment compared to some of the things that we've been looking at today. And I think we owe it to ourselves, and perhaps to the community, to at least investigate that and sort of turn the equation around.

Now, I heard you earlier saying you have to be very careful with that because of the graph that you showed. I couldn't follow you, I'm sorry. So I need to talk with you about that. I sort of have a feeling that we need to put that first instead of second. What can we do first about capturing, and then calculate the rest. That's just my perception.

I know I'm not the only one in the room who's thinking that way. That's my new paradigm that I think we need to consider. And I'm more than willing to put in a whole lot of work to with the working group, but I think the municipal people should be part of that, as well.

MR. HILL: I know an incredible amount of work went into this, a very complicated analysis. My question really is what are the next steps, and are you guys recommending a preferred alternative?

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MR. RAICHE: A preferred alternative. Tom, do you want to talk about what our path is?

MR. BRUECKNER: The next step would be to take this presentation to the Board of Commissioners on Tuesday at their next meeting. The first presentation will be to the Long Range Planning Committee to the board and then there will be a presentation to the full board on that day. Then they will take this under advisement and I'm assuming that they will have a number of questions and may require further meetings with MWH.

I think also what is obvious is that this Alternative 4 issue, and should that be pursued further or is there some reason that the commissioners may just decide they don't want to go there. If that is the case, there would probably be some further studies done, and in addition as Rich just pointed out, there needs to be a little bit more work done on the water quality analysis. We didn't quite get it finished as we had anticipated because of unanticipated problems, but there is that component, as well.

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I assume that the board will at some point make a recommendation, and I don't know if there will be further information developed before the board that could also be presented to another Stakeholders meeting prior to the Board meeting just to get further feedback, as the Chairman had alluded to that he values the input.

So I'm not quite sure exactly how we're proceeding, but I do know that we're going to the board next and waiting to hear what their pleasure is.

MR. DOMENICA: Okay, three more, and then we have a question we have to answer.

MS. KARP: I just want to offer a recommendation, and this is now my second time at one of these Citizen Advisory Committee meetings. I think these are really productive. I think it's a productive way of getting information out to the community and to the very organizations that are concerned about water quality. So my recommendation to the Commission will be that we reconvene the Citizen's Advisory Committee when some of these additional studies have been done.

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MR. BRUECKNER: Excuse me, Caroline, you keep saying Citizens Advisory Committee. Do you mean Stakeholders Committee?

MS. KARP: I mean the Stakeholders, sorry. And I would say that because we have invested a lot of time. And I think actually, I think it's worth following this through to see how the Commission thinks how much stormwater can be removed up front. That would be my recommendation as closure.

MR. HAMBLETT: I echo Caroline's thoughts about, at least another gathering of this group, postpresentation. The commissioners, I would also echo what Jan has suggested. This is all very detailed hard work.

I still feel like there needs to be a more exhaustive look at presenting flow into the system, green infrastructure alternatives. I would also like to know, are there other cities around the country that have tried that are approached or try to approach now and what are the status of that. What can we learn from other locations now.

MR. RHODES: On one of the previous graphs you showed compared all the alternatives

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just building the Pawtucket Tunnel. How would that option, the Pawtucket Tunnel stack up on this table?
MR. RAICHE: I can do the path on that pretty readily. I don't want to do it off the top of my head.
MR. DOMENICA: We're 15 minutes over, and we have a question in front of us which is at the beginning we had a request to have a summary of the status of the stormwater program from Carolyn. And Sheila is willing to do that. That would probably take about how long, Sheila?
MS. DORMODY: Two minutes. This position of the group given this is the, maybe the last meeting. We'll have three comments, and then Sheila's summary and a couple of more comments, and then we're done. Brian?
MR. BISHOP: Just quickly because it wasn't at the time I was considered out of work. Only because I've done quite a lot of work on the question of tenements in Providence. Recently, I would have to dissent from what is on the record from Caroline regarding the idea that the costs goes to absentee owners.

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In Providence, some 50 percent, over 50 percent of the properties that are owned by people that don't live in them are own a single property. These here most often are these people that were owners and moved to another property. The demographic of these people are not absentee landlords. In the sense that they are large conglomerates owning many, many houses.
And secondarily, the idea that they can simply bear the additional costs and somehow won't trickle to the tenants is the same thing that's animating the tenent tax debate in Providence, and so forth, and you know, I think one might delve in the economics of that if we want to add to this debate. And I would just leave that sit.
Secondarily, on the idea, I had said at the beginning I don't think, there was an attempt at the end of the last Stakeholders meeting. I'm not sure if we voted, but I think there was an attempt to gather at a sense that the group had a consensus on the outrun. That's obviously not to be attained here, and there may be some bureaucratic deadlines or other reasons

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why this, at least, begins its course of decisionmaking by those responsible for making a decision. I think the idea of continuing the process whether, you know, somewhat informally in the meantime, as Jan suggested, or more of this is not a bad idea. The one thing I haven't put on the table.
The one thing I don't see in the way a lot of this information is presented, and I kept asking for comparisons to what we spend on Phase 1 and Phase 2, and so forth, is also. My agreement with the effort that we made in the first Stakeholders was based largely on the idea, that at least according to the cost models we had at that time, that we were capturing the most volume for the least dollar, so that the dollar per volume was most cost-effective.
You know, one could back into that here, but I just spent some time trying to go back over those figures and recreate that wheel, and I would think that the NBC, as well as any of us reconvening are going to want to understand what's the cost per dollar of any of the proposals here so that I think that that can help inform, you know, what is low. And I

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understand, some things can't be done, you know, if you build the tunnel, you're going to build the whole thing. I think that that's critical, and while we've talked about private for much more localized infrastructure for stormwater collection, I think an enormous oversight in that has been.
I think it's quite possible that we could have localized temporary collection of sewage. That's what those of us who have septic systems do all the time. It doesn't worry is that we have, you know, a thousand gallons of sewage sitting in a tank right outside our house. That's just normal. And that's a technology that hasn't even been on the table, and I can call some possible promise rather than trying to collect all the rainwater in Providence.
MR. DOMENICA: Thank you. Harold?
MR. GADON: Just a quick question, Rich. You didn't answer Lance's question. Are you going to make a preferred recommendation to the board even one that you're not ready to make a recommendation?
MR. RAICHE: Honestly, at this

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point what we'll be presenting to the board are the four alternatives for the board's discretion, for their analysis and their determination of preferred alternative. I am not going to kick any one of these children and single them out.

MS. DORMODY: Sheila Dormody with the City of Providence. My comment first before my report on the stormwater utility, whenever you're ready for that, was from our very first meeting we had a parking lot item about affordability of how we can address it through lifeline rates or some other equitable distribution of the billing system and we were looking for models from other communities.

So that's one more piece of information that would be helpful to add in to the mix. And I would second that we do need more meetings as Stakeholders in order to consider all of the information that we've just received moments ago.

MR. DOMENICA: Thank you. And now you have stormwater summary.

MS. DORMODY: Ready. Okay. The brief recap for folks who may have missed my

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first report on our Phase 1 feasibility study for our regional stormwater utility for the upper Narragansett Bay Region is for the past year five municipalities at the head of upper Narragansett Bay, so Warwick, Cranston, Providence, Pawtucket, Central Falls, and East Providence have been working together to figure out if a regional approach to stormwater management made sense and if our regional stormwater utility was the best way to pay for that.

The answers to those two questions in Phase 1 was yes, we should keep looking at these questions. We found that yes, we have real shared problems that spending more money on them would actually help solve those problems. We know how to solve those problems, we would need more money to do it, that a regional approach to do that would be both most cost-effective and efficient than the current system we have, and that our stormwater's utility fee, a fee based on how much impervious cover property would be the most equitable and efficient way to be paying for those costs. So that brings us to Phase 2. Six of those

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municipalities are continuing to work together in Phase 2 which will be beginning just after the beginning of the new year. We've just hired a consultant to be managing that, and we expect the outcomes of that, probably 14-month process to include a more detailed version of what the total cost of those services, total cost of the utility would be, what the scope of services would be, and the things that we would be getting at our, what would it take to come into compliance with MS for permits for those municipalities, as well as complying with the total maximum daily requirements for those municipalities.

MR. DOMENICA: Thank you. Just stay there for one minute Sheila. Any questions for Sheila? Caroline?

MS. KARP: So do you have even a rough estimate or range of numbers about what volume a stormwater in theory is generated by those properties?

MS. DORMODY: No, and I don't expect to have that from the Phase 2 study.

MS. KARP: Because I've had students working this, so and Tom Uva has helped

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advise those, so at least I'll give you estimates.

MS. DORMODY: Great.

MR. DOMENICA: Brian?

MR. BISHOP: There sounds like there's a bit of a working group here, and I'd be interested in paying attention only because I think the effectiveness of non-pervious surface has been given, you know, a certain reasonable prospective here, but I'm equally well aware that just having non-pervious surface doesn't mean that you don't have runoff. So that I'm concerned about the triggers, and again, I don't think here is -- until we combine these processes, but I would like to stay in touch.

MS. DORMODY: Great. I'd be glad to talk to you more about that.

MR. GADON: Sheila, I think you couldn't invite to meet as the committee advisory.

MS. DORMODY: Yes, that process in addition to the process with the steering committee and municipalities also has a Stakeholders group that's running intermittent parallel with it to bring out these types of

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concerns.
MR. BREUCKNER: Please make sure you sign the sign-in sheet so we have an accurate record of who attended. And the second point I want to mention is that this slide presentation that was given today should be posted on the website as soon as we get it from MWH we'll try and get it up there. So if you want to go back and look at some of these slides to refresh your memory or have questions you can do so.
MR. WALKER: I just want to go back to the first meeting where I stood up towards the end and asked the question when we all talked about affordability as to how that relates to the non-residential ratepayer in the system. And I don't see any of that in the discussion today, and don't know if that's going to be part of the discussion, whether you've got data or not, when you make the presentation to the Narragansett Bay Commission on looking for alternatives.
Because equally as important as the people in the residents have to pay, it's also the people that pays them the wages that lets

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them pay, that we have to make sure we don't price them out of the Rhode Island marketplace, and then those people out of jobs.
And the second thing is when you start to layer on your rate structure so you have the CIP from Providence and you have the NBC costs additive to the rate, and you start to look at the affordability, you can't forget about some of the other things that are out there, including if a stormwater utility district were to be passed that would be additive, as well.
So we've got to be careful on the -- and I'm seeing it more and more on the one offs of the great ideas that are out there, and they only add a little bit. But when you start to add them all on top and layer them all up, it gets very expensive very quickly, and we lose sight in just the notion of we can afford this, we can afford that. And at the end of the day, you can't afford what you're left with. So, thank you.
MR. DOMENICA: Okay. Thank you all for your attention and integration and ideas, and I'm sure the commission will be digesting

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the information from both this group and the consultants, and we'll get back to you on the need to get together again and additional information. So, thank you, very much. You're dismissed. The time is 12:30.
(MEETING CONCLUDED AT 12:30 P.M.)

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C-E-R-T-I-F-I-C-A-T-E

I, PAULA J. CAMPAGNA, CSR, a Notary Public, do hereby certify that the foregoing is a true, accurate, and complete transcript of my notes taken at the above-entitled hearing.

IN WITNESS WHEREOF, I hereunto set my hand this 13th day of January, 2015.

PAULA J. CAMPAGNA, CSR, NOTARY PUBLIC/CERTIFIED COURT REPORTER

MY COMMISSION EXPIRES: April 25, 2018

IN RE: CSO Phase III Re-Evaluation Stakeholders Meeting

DATE: December 4, 2014

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