

**South Central Connecticut Regional Water Authority**  
**May 16, 2022**  
**Special Meeting Transcription**

David:

I will call this special meeting of the Regional Water Authority for May 16th, 2022 to order at 8:30 AM. I will note the safety moment for back injuries, something to read and absorb when you have a chance, and move on to the meat of the agenda, which is the discussion of an application that we are preparing to send to the RPB. We are deliberating about sending to the RPB for the design phase, of design in some work for testing and all, phase of the Lake Whitney Dam. So, Larry, I don't know if I hand it over to you or right to Sunny, or how you want to do that?

Larry:

Well, no, you stole my thunder, so we'll go right to Sunny.

David:

Okay. We didn't talk first. That's the problem.

Sunny:

That's good, thanks. Thanks David. Good morning to everyone, David, Tony, Suzanne, Catherine and Kevin. First, I would like to certainly extend my thanks to all of you for accommodating the special meeting into your schedules. I know it's been extremely busy, and Monday morning is certainly, which is something that I'm very grateful about and for also expediting the application process. So my sincere, I would say, gratitude.

Sunny:

So in this application, we are requesting approximately about 5.5, 2 million for the design of the Lake Whitney Dam and spillway improvements. This is going to be called the phase one, and we are going to submit the application for both the authority and to the RPB for review and approval. The phase one cost is a not to exceed amount of 5.5, 2 million, which includes 1.9 million approximately spent to date on evaluations, geotech investigations, and design work, which is at 45%.

Sunny:

The phase one proposes to advance the analysis of these selected alternatives to the point where a final decision can be made on one alternative, and then completing the design of the same. So that's a very brief intro of what this application is about. With that said, I will now hand over the rest of the presentation to Larry Marsik, I think I'm sure whom you'll all recognize. He was the protagonist in the Whitney Dam video. And now Larry, it's all yours.

Larry M.:

So, you guys had a chance to see my video. I guess, you'll know I'll never become an actor, but at least a good engineer. Anyway, it was different for me to do something like that, so I really enjoyed it. So anyway, my name is Larry Marsik, Lawrence Marsik. I'm a professional engineer in Connecticut, New York. I've been with the Authority for 19 years, and I spent most of my career there working with dams,

all our dams. We have over 31 dams, some are very tall and some are very small. But today's project is regarding the Whitney Dam. So I'm probably just going to go over just some of the brief information. And if you have any questions, I don't know how you handle it. Is the questions, you wait till after the presentation or during the presentation? How have you handled it in the past?

David:

Well, it depends. I think what we'd like to do is maybe have an overview from you, and then we can ask questions so that we maybe get some of them answered as you're moving along.

Larry M.:

Okay. Okay. We have a PowerPoint presentation, so can we get started with that? Okay. So the dam was built in the 1860s, 1861. The bad thing is that there was no such plans ever. We don't even know if there was a design engineer who designed a dam back then. The dam was under a contract with Eli Whitney II, who was the factory owner just below the dam, McClellan, which is the contractor and also the New Haven Water Company. The dam was completed in '61. This to show you how old it is, is that Abraham Lincoln wasn't even president by the time the dam was built, I believe he became president just after that.

Larry M.:

The reason for building the dam was, the New Haven was their first public water supply. And then also, Eli Whitney II had a factory who made guns for the civil war, and he used the water power for hydro mechanical to make his guns. Just soon as they finished the dam, the dam in 1864 was raised, because there was a drought and there were shortage of water, and both the New Haven Water Company and the factory could not run their equipment without water. So they raised the dam probably about four feet in 1864. Didn't make it wider, just made it higher.

Larry M.:

And I think in my video, you can see where we show you where we raised the dam. And then in 1917, the New Haven Water Company hired an engineer called Albert Hill. Great engineer, very good engineer, who extended the spillway. Was originally a 100 feet wide and made it 250 feet. And they did that, because that was very important. And at the same time, they needed more water, so they raised the dam again. Didn't make it wider, just made it higher. So those are the two things that happened in 1917. The dam's about 750 feet long, 43 feet high, and the spillway now after the 1917 improvement, is 250 feet long. The site is historic, and the reason it's historic, is because the Eli Whitney gun factory, Eli Whitney was the father invented the cotton gin, and the son who ran the gun factory, was the first to make interchangeable parts for the rifles that was used for the civil war. So he's known for the assembly of gun parts.

Larry M.:

So that's why it's a historic site, and was done with Eli Whitney II involvement. The dam under the state's classifications of dam, the dam is classified as a high hazard dam, and that's the highest hazard and classification there is. And the reason for that is, if the dam was to fail, it would cause loss of life and significant property damage downstream. So the regional owns quite a few high hazard dams, similar to Gaillard and those dams. Like I said, the dam was raised a few times. We don't have plans during the original construction.

Larry M.:

So there was no stability requirements back in 1860. They didn't really know how dams actually worked back in 1860. So there was no stability improvements over the years for the dam, making it more stable. There was, it says, no spillway. We did have the improvements in 1917, but even with those improvements, the technology has changed over the years and we actually need bigger spillways. So want to change the slide?

Larry M.:

So the need for this proposed action, we retain the services of GZA Environmental to do an analysis on the dam. And one thing they came up with, which we knew about, is that the dam needs to be designed for the probable maximum flood, which is 34 inches of rain over 72 hours. Design engineers like us, we call it the Noah flood. You never want to see that happen, because there's so much water, there's going to be a lot of issues. Just to give you an idea how much that means, back in '82, if I'm sure some of you remember the '82 flood, we had half as much rain, and there was considerable amount of damage back then on the '82 flood.

Larry M.:

So this dam has to been designed for twice as much as rain that we got back then. I do have a picture. If anybody ever goes by or ever been around the Whitney, there's a bridge downstream, a covered bridge. And we have a picture of the water going through halfway up the windows on the bridge, which is unconceivable of something like that happening. And that was only the '82 flood. So the spill wave that's there that got wind from a 100 feet to 250 feet, is currently designed for what you call the 100 year storm or 150, somewhere in that ballpark there. That's way too small for what really needs to be done there. So our goal is to upgrade it to a 1,000 year storm. Ideal, if you're building a new dam, you would design the spillway for a probable maximum flood, but you can't do that here.

Larry M.:

So what we want to do, is to upgrade it to a 1,000 year, and then actually make the dam itself as a spillway. But to do that, you have to armor downstream of it, so when the water goes over the top of the dam, it doesn't erode out below the dam and cause it to fail. So that's our goal here to do that. Stability also is inadequate, because of raising the dam twice and not knowing what the initial stability was. We need to increase the stability of the dam. Very important. Then also, seepage. Seepage is important to control it. All dams leak, everyone. You can't build a dam without leaking. The problem is, you want to make sure that it's controlled. We did have a chance to show Larry what the seepage is out through the dam, and he didn't think it leaked that much, but all dams leak, and we have one of them that leaks also.

Larry M.:

So we just want to be able to control that. And then we've been monitoring, we have two gauges downstream that monitors how much it leaks. So the good part, it hasn't changed much over the years, but still, we want to make sure that it doesn't change in the future. The next thing is the useful life. Typically, useful lives for dams are a 100 years. As you've seen, a lot of our dams are over a 100 years. This one here is 160 years and it definitely needs to be upgraded to current standards of today.

Larry M.:

The reason for the dam was to supply water to the Whitney water treatment plant, which is our new state-of-the-art water treatment plant, which we need to use it in case we have droughts and stuff. We do use it at a lower rate today, but it can produce a lot more water if we need it, especially during droughts. Given climate change today, been to a few seminars regarding that. And what they're saying is that we're going to have a lot of increased, very strong storms. So more rain at a faster rate. Then additionally, we're going to have more droughts than we normally have. So the peaks are going to be different regarding that. So we definitely have to make our dams stable in these higher storm events.

Larry M.:

So the phase one rationale, why are we going to phase one? Well, under the current regulations, we can only spend up to \$2 million and we're at that limit right now. And we yet feel comfortable to go in front of the board with a dam design that we feel that we can control cost. And it's... Sorry. It's the best interest for the RWA. So we're asking for additional funds in order to control the increased costs, because right now, knowing after this COVID stuff, all the steel costs and all the material costs are outrageously high.

Larry M.:

So when we started this project, we thought we knew what costs were, but today, the newer revised costs are extremely a lot higher. And at first, when we started looking at this dam, the costs were very low, but now it's getting up to be very high. So we want to make sure that the alternates that we choose to present in front of you, is the best alternate for the RWA. One thing that we're doing new under this phase one, is we're doing a new type of construction here. We're doing the early contractor involvement where contractors are on board. Usually what we do is, we design a project by engineers. We put it out to bid, and then we select the best contractor for the project. And this case here, we're going to select contractors... You can switch the next slide. And I'll go through the-

David:

Larry, before we go past that slide, Suzanne, you had a question. Was it on that last slide before?

Suzanne:

Yeah. Just to understand the summary, Larry, is that... Am I the only one here on echo when I talk?

David:

I'm hearing it from you as well.

Catherine:

I hear it too.

Suzanne:

Yeah, okay. Here, let me do this. Does that help?

David:

Yes. That helps.

Larry M.:

Yes.

Suzanne:

Okay, great. I want to make sure I understand the summary. You were beginning this project and you were going forward with a certain plan. However, due to high inflationary costs, you are adjusting the plan. You'd like to get more money so that you can safeguard the completion of the plan through the process of the approval levels. And so therefore, you're coming back for that additional approval. Is that what I'm understanding?

Larry M.:

We went through the process of doing some field investigation. So there's a program to go out there and drill holes through the dam to see how it was built, or at least get an idea how it was built. From that, we sit down and try to go over different alternates to see what alternate is the best interest for the RWA impacting the people, the environment, supplying water to the treatment plant. And we came up with something at 45% design. So we have a design at 45%, but at this time, because of cost and other things, we felt that, that may not be the final alternate to select. So we feel that we need additional funds to move forward from the 45% to at least a 90, 95% to come up with something that we feel that we can present in front of you, and we feel confidence in the estimates and the cost, and that it won't go over what we said it's going to be. But right now, we're actually shooting at a dart board, knowing what those costs are going to be.

Suzanne:

And so, what does a 45% design mean?

Larry M.:

It's half design, about halfway done.

Suzanne:

Okay.

Larry M.:

That's what it means, it means halfway done. So a lot of the key elements in the design haven't been designed fully, it gives you the concept what we plan on doing in terms of what we want to do, but there are, just to let you know, as we looked at 30 alternates, even more than 30 on this so far, we come down to probably five or seven that we feel that are good, but we need additional funds to go forward, to find out what's the best design for our doing way to go forward with.

Suzanne:

Okay. So we've spent \$1.9 million so far on design, exploration, testing, et cetera, and we're about halfway there.

Larry M.:

Yes. Yes. So once we get to the second from last page, there's something we can show you that really adds to the cost, and I'll explain it when we get there.

Suzanne:

Okay Larry, thank you.

Larry M.:

So during the phase one, we currently have a set of plans that are 45% design. So many alternates are to add, and stability is the key thing here, is to add concrete downstream. That means to build something downstream, it's going to cover the existing face of the current dam, but it adds a mass concrete to hold it from sliding, or the dam overturning. And the same thing, our 45% design calls for a mass concrete upstream. So that's another alternate and that's the one we've currently gone with, but we're looking at possibly doing something downstream. We also looked at an independent new dam upstream, and I'll tell you some of the reasons between the existing dam versus a whole new dam. And then there's so many variations of those, but those are the basic of what kind of work we're going to need to do there.

Larry M.:

So what we did is, and this is relatively new to RWA is to, we put together a set of contract documents for an RFQ, request for qualifications. And what that means is that we're going to go out there to the public, and we're going to ask for qualified contractors to do work like this. So we're probably going to get a dozen contractors that's interested in doing something like this, and we're going to select three out of them. And then from those three, they're going to help us go forward to the 90% design. And the reason for that is that we can get their involvement, because they may have ideas that we haven't looked at. So there may be another offer that we may look at that they have experience with, and it may save the RWA money if getting the contractors in there early. So some money's in there to pay them, to help us with the design, because the contractors really have the experience of building these things, and they may have some key things that we're not thinking about.

Larry M.:

So the intent is to get a contractor, early involvement contractors, three of them on board and award this early involvement to three contractors right now, only to help us with the design type thing. We didn't give them the project as of yet. One of the next item is called a grouting trial program to the existing dam. One thing that we found out during the investigation, that in all the previous engineers looked at the dam as being a solid mass of concrete. But if you go in there and you look at the dam, when I started drilling to it, I found out it wasn't. All it was, was they made a nice, looking at the face downstream, real nice face. They made a face upstream water side, and then they just fill the inside with just rocks, no mortar, concrete or anything, just rocks.

Larry M.:

And that's not a good thing. You want something to be solid. So one of the things that we're thinking about is grouting it, which means basically gluing everything together inside the existing dam. So that's an alternate that we're looking at also as part of the program. We may want to do upstream concrete, plus gluing everything together downstream, so it acts together, not acts separately. And then currently we've been doing community outreach program. We did an in-person program and a virtual program where we're trying to get the community to help us know what their needs are out there and stuff, what their concerns are in terms of noise, in terms of traffic. I know we have a school downstream, the Eli Whitney School there, and we told them that we're not going to bring trucks into their driveway and stuff. We're going to build a separate access road to get into the site without getting them involved.

Larry M.:

So we're just looking at also the concerns of our joining neighbors and neighbors that are impacted by Whitney Dan. So far, it's been going very well with the community outreach. We got some ideas and stuff that we have to address when we're going forward with this. You could change the sheet. So again, we'll go back to the early contractor involvement. It's a delivery method different than what we have used in the past. Again, we're involved in qualified contractors during the design phase, we're thinking three. This contractor will help us tweak the design drawings and working plans, which will help us reduce the risk during construction.

Larry M.:

Meaning that eliminating what you call change orders or reducing change orders. They're going to know more about the project, so when they give us a number, it's going to be a more exact number. When contractors don't know anything, they put a high number on it. So now they're going to know exactly what we're going to know, so their number's going to be truly a good number. So what happens is, once we have the three contractors, we know they're qualified, because we went through the qualifications for them. Now they're going to give us a number. So before we go in front of you guys again, we're going to know what their number is, and we're going to feel more confident going in front of you without any major changes to that. So that's what we plan on doing in the phase one. Okay, go to the next page.

Larry M.:

So again, this early contractor involvement, our debate issues and RFQ to competitive market, meaning that we're going to go out there to the public and solicit contractors. The contractor's going to submit a qualifications package. Hopefully we get a dozen contractors. We're going to select up to three contractors that we want. I think three fits us well, more sometimes is not always better. So these three contractors, we're going to pay them to help us come to the final design. So all three will be involved into getting the project to the final design, and then they're going to submit a bid on the final package that we put together. So, the firm that we selected will be based on price and qualifications. Next page.

Larry M.:

So when we looked at this cost, we're probably 1.8, 1.9 in terms of what we expended to date, we estimated 700,000 for completion of design and permits. Also, consultant fees, \$400,000, RWA fees, 400. Early contractor involvement, I told you that we were going to pay them, that we have \$200,000 in there to pay the contractors for their services to help us complete the design. And then, which is a big number here, the grout trial program, if needed. So if we select an alternate that requires the grouting of the existing dam, we have to do a program to see if the grouting's going to work. So basically, we're going to try to glue all the rock together, and if we don't glue enough of them, we're not going to feel confident that the glue is the right answer there. So we have to do a trial program, and that trial program is \$2 million. If in fact we don't need it, because we've selected alternate that doesn't need the rocks we glue together, we'll have \$2 million left over that we're not going to use.

Larry M.:

So that's how we came up with the 5.52 in terms of the cost estimate. So regarding schedule, we do have the contract developed already for the request for qualifications. And we figured that if once we get your approval, we'll go out to the public, and hopefully we can get three contractors on board by August of '22, that's right around the corner. Final design of the project, March 23. Before we can grout

the dam, we have to go get a permit for. And so, those two items may not, if we again, not pick a grouting alternate, then those two go away. But if they do, those are the dates that we anticipate.

Larry M.:

And then we'll be in front of you back in November of 2023 with the real application, with a good number that we know what it's going to cost us to do. And then construction in '24 to '26. I don't know at this point, if we're going to go over the summaries of alternates, I don't know if it's needed. We again, downstream, upstream, new dam, there's a whole bunch of them, and I don't know if it's necessary to go through all these alternates, but if you want, I can do so.

David:

Well, basically I think, let me see if I can summarize and understand. You have a project that's really larger than most, any project we've had, maybe with the exception of the Whitney water treatment plant.

Larry M.:

Yes.

David:

And so you're looking at alternatives, more so than usual, and therefore it's costing a little bit more money than usual to do that. But I think if you look at the \$5 million in design and testing and all, it's still going to be within that 10, 12% of the overall project, which is not unusual. So the savings we might have gotten for a larger project on this aspect of the cost is being used up by the fact that we're trying more alternatives. And I think that's good.

David:

I think, the alternatives, I like obviously the lower range one, \$38 million, but you've got to do more testing on those and see if that can work and involve the neighbors to the degree that is important. And SHPO is also involved in it, the historical group from the state I understand. The OCA has been given a primer on this and he's really a construction contract expert, so hopefully he's helpful in some guidance on that as well. It looks to me like you're asking us for permission to move forward with testing out alternatives and getting the design more complete so it's almost ready to go out to bid.

Larry M.:

That's correct.

Sunny:

Absolutely. Absolutely.

Larry M.:

Actually, before we come in front of you, you're going to have a contractor that's going to give us a number that we can go in front of you that we can live by. So it's going to be a lot better than to typically we'll go in front of you, we're just guesstimating what the contractors' cost is going to be. So this time we're going to have actual cost. So it's a better plan.

David:

Members, what are your thoughts?

Kevin:

Hi, good morning, David-

David:

Morning, Kevin.

Kevin:

... and Paul. Hi, it's Kevin. Larry Marsik, I really appreciate the history and the background and all the work. And I think it was presented very well, so thank you for that. I have more of a general question. And my understanding is that we started, or management, or may previously had been Ted Norris, started with his team looking at one A way or one way to resolve the dam issue. And that, that thought process has changed to possibly several different ways, which obviously Larry had just gone over some of the different alternatives.

Kevin:

But I'm wondering, is where we're at today as a result of because we started in one direction and now we're considering other alternatives, or is it because of the decision making process that was used, or I guess my second part of that question is, what is the decision making process that is used generally speaking? And maybe that's a question for Sunny when you're starting these projects so that you have less than 30 alternatives by the time you reach a certain point. I'm curious on that, but I really appreciate the background. Thanks.

Sunny:

Yeah, sure. Thanks Kevin. Good question. I think typically, I mean any design project, we do look at many alternatives. So in this case, as Larry mentioned, 30 alternatives were examined. But because of, at that time when the cost was considered when it went back and looked at all the background information, the cost were not that critically high. So it was ranging around 10, \$20 million. Then I would say when was envisioned in 2017, '18. But I think the cost have crept up, and now the costs are really going up every day almost. So we really had to go back and sharpen the pencils a little bit and look at what options can we look at, and to see which would actually give us the best, I would say, bank for the buck.

Sunny:

And the reason why we did not really go with one of the lower options that you see as \$38 million, was whether SHPO would actually go along with that option. So, having the historical facade, could have been, I would say bottleneck, which we may or may not have been able to cross, but today looking at the cost itself, was one of the primary driving factors. We said, "Hey, you know what, it's worth looking at an option to explore further, because it could actually double the price." So, if you look at the last slide, that slide will range from almost 38 to \$65 million. So, one of the options that I think earlier Ted was more gearing towards, was the upstream dam and also a cofferdam at Davis Street.

Sunny:

So, not only that has a higher cost option, it also has a lot of other, I would say, traffic related issues, environmental concerns, lowering, I would say, the upper basin of the reservoir. So many other impacts do come into it. So we, I would say, looked at it in a different fashion. And we said, "Okay, why don't we look at the downstream option?" And I think one of the downstream options was also suggested by GCS. Initially, when this whole, I would say, the design cropped up over three, four years ago, GCA did suggest, I would say, the downstream option, but because of the SHPO issues, it was put on the back burner. So we took it up and we said, "Hey, you know what, this is an option we should examine now." And that was the decision making.

Sunny:

Going forward too, I think we would look at two or three options. The design itself is pretty much, I would say, a lot of design is not going to change, except when it comes to the concrete buttresses and the cofferdam, as well as the index structures and things of that sort. So when we go forward, the existing geotechnical work that's being done as part of the \$1.9 million would be useful to us. There was a lot of soil boardings, and things of that have been already accomplished. And those information will always be useful in completing the design. So the drawings, which we will advance, will be the ones that we will select out of these six alternatives. And as we have already presented the alternative, which is the cheapest at this point, is the one that we are all, I would say, as a team, we are actually looking at it as a very viable option.

Sunny:

There are going to be challenges to it construction wise, for sure, and that's where the ECI contractors would come in to mitigate that risk. So the downstream option too, is not without risk, at least construction risk, but we are going to bring in the ECI option to mitigate that risk, because I don't think the ECI has ever been done before. And so, that'll be another new one, which we are going to do as a contract delivery method. So bringing in the contractors, taking their intellectual property, and what we have done is, in the RFQ, we are giving them an incentive of \$50,000 for pretty much their intellectual property. So they're going to sign off an intellectual property, give it to us. So even if say contractor A has an idea, which we are going to implement as part of the contract documents, contract C is going to be the lowest contractor.

Sunny:

"The contractor cannot come back to us and say, Hey, you took my idea, and now contractor C is going with it." So, by giving this \$50,000 incentive to each one of those contractors, their intellectual property remains with us. In that way, that's the idea behind the \$200,000. It's actually 150, the way the contract language for RFQ is worded, it's 50,000 for each. So they sign off on all, I would say, the intellectual property to us so we can incorporate their ideas. And one of those three would be the winning guys, but we can actually use ideas from the other guys to make our risk go down, at the same time, lowering the cost. So it's a little different in the way we are approaching the design and it's a little different the way we are approaching the construction as well.

Larry M.:

So, just one thing-

Kevin:

Okay. Thank you.

Larry M.:

I'll just add one thing.

Kevin:

Oh, go ahead.

Larry M.:

On the summary sheet, option three is the one that the 45% design drawings were based on. So just to give you an idea what road we're traveling down. And then also, the 30 alternates that I mentioned, was a variation a lot, changing a cofferdam here, putting a different cofferdam here. So they're all not all new starting from scratch alternates, they're variations from the basic design concepts, upstream, downstream, new dam type things. So I just want to let you know that, we looked at 30, but there's variations in all of them.

Kevin:

Okay. Thank you Larry, and thank you Sunny for that detailed explanation, I really appreciate it. I just have one other question. I know everyone, I know that the focus is on the engineering of the dam, but what percentage of a factor in this whole process does SHPO play, and what the neighbors want, versus what would satisfy what we need to do? And I know everyone wants an attractive dam as well as obviously the critical point is a dam that's going to work for another a 100, 120, 200 years safely, but does SHPO or the neighbors have any veto power over what we finally decide? Or do we, at some point in time, do we say we appreciate all of the comments, but we have to go in this direction for the following reasons, or can they stop the project? How does that work?

Larry M.:

Sunny, can I answer half of that anyway?

Sunny:

Yeah, that's good.

Larry M.:

Regarding the SHPO, we need a Connecticut DEEP permit, D-E-E-P permit, and we also need what we call an Army Core permit. Army Core requires shipper approval. So yes, they could stop the project if SHPO isn't on board with us. So regarding the public, Sunny, you may want to answer that one.

Sunny:

Yeah. See both, I would say, for SHPO, they give, I would say, a tacit approval in a sense, we don't really have to get a permit from SHPO, but US Army Core cannot give a permit without SHPO saying they're okay with it. So, in that way, there is a hurdle which we will have to cross. With regard to the community, as Larry pointed out, we did have, I would say, two meetings. One virtual, Steve Mongillo was presenting both of them, and one, I would say, in-person. Both of them were pretty decent. There were a few folks who were actually interested in the historic facade, and one was the Director of Whitney Museum right now. The rest of, I would say, the folks who turned up, was asking questions more related to the some sewers, and a few people are interested in how long the construction will be, what will be the impacts on the sidewalks, and will we be able to walk?

Sunny:

There were some issues, concerns about noise pollution and things. So, it was something that was, I would say, a little pleasantly surprising to us, that they didn't really bring a lot of, I would say, issues which Kevin, you just mentioned along the SHPO lines, but 80% of the questions, some of them were directly town related. They were all, I would say, are the roads going to be done again, or the bridge is going to be done again? So we, I would say, let them know that these questions were better addressed by the town, because this Whitney Dam is not going to really address those issues. So, we did have a few concern, I would say folks, but not to the extent that we were expecting we will have.

Sunny:

But it is work in progress. And I think our next meetings would be with SHPO to, I would say, sound this idea off and see what they feel. And perhaps I think, in earlier, I would say, budget sessions, we did have a meeting where we did say that if we have to do some kind of a facade that looks like the existing facade, like the stone rubble masonry out there, we might be able to give them that in some fashion or the other, taking into consideration what the costs are for that.

Sunny:

So, that'll be part of the exercise of this \$5.2 million as well. So this \$5.2 million, we will try to build some market panels and bring shipper out there and tell them, "Hey, you know what? We can preserve the existing one, but we can actually give you a new one which looks close enough to the existing one." So as part of this phase one application, we intend to do some mockup panels, like a 10 x 10 mockup panels, so they can come out to the site, look at it and say, "Hey, you know what? This is acceptable. You know what, go ahead and put the downstream gutters." So that is the alternative which we are looking at right now. Larry, if you want to jump in, please do.

David:

If Catherine, Kevin, you still have more questions?

Kevin:

Not right now. Thanks.

David:

Okay, thank you. Catherine?

Catherine:

Yeah. Thank you, Larry and Sunny for making this complicated project seem a little bit more understandable. I do understand, I mean, it's clear to me that not having the original plans, will make it a little bit difficult to try to figure out exactly how this dam was constructed in the first place. I'm a little concerned, well, and I know I'm still using that, I'm new, excuse again, but the original estimated cost was \$10 million, and now we're looking somewhere between close to \$40 million to over \$60 million. Is that all supply chain challenges and increased costs, or is it just that what you discovered in your investigation, has increased the cost? And I do have some follow up questions.

Larry M.:

Sunny, can I answer that one?

Sunny:

Yeah, please. I'm going to use the same excuse as Catherine did, that I'm new too.

Larry M.:

So the \$10 million came out of two previous projects that were done in Connecticut, but in both projects, they weren't within the city, they were in more of a rural environment. And then also, they were allowed to drain the whole lake. So costs like that drive up the cost. Our cofferdam to one of the alternates that we picked is close to eight, \$9 million, just to build a temporary dam upstream so the people upstream could still have the same water surface they have today, but then we could still work on the dam.

Larry M.:

So the original, back when we put the... We didn't think about all the environmental impacts and stuff, we're saying, "Okay, we got two dams in Connecticut, same year, or pretty close to the same thing that was built here in the 1860s. It should be the same cost." It's not the case, because of where we are situated, we have a treatment plant. Those other two dams didn't have treatment plants. So all of them had a lot more costs in the project.

Catherine:

And do you anticipate any easing of the supply chain issues, and maybe some of these costs might go down in the next, well actually, maybe not by the time you start construction. Well, I don't know, construction starts in a couple of years. I mean, do you have any idea?

Larry M.:

No, no. Just like gas. Do you know when gas is going to come down? We have no idea. I know our supply chain for pipe is going crazy too. It's just going crazy. It takes a year to get a project on board to buy materials. I mean, it's so hard to schedule something like that. It's no longer an easy task. So yeah, we don't know.

Sunny:

Kevin Just add to it. I think, we are also going through these funding requirements for DWSRF and WIFIA funding. And in the recent, I would say, a month or two with the Build A Better America Act, the BABA Act as they call it, the purchasing rules and the procurement, I would say, the legislation that is there, is much more stringent than earlier legislation. So that means raw materials onwards, anything you buy, they're going to require you to make in America, mine in America. So, we don't really see the cost really dropping any time, I would say, precipitously to help us. And this new legislation, which we are going to, the WIFIA itself has sent us request to support, express support from many of the utilities, to say that don't put such a stringent legislation, because the infrastructure needs to be improved, but you put in some legislation that requires right from mining to manufacturing to everything within a few years, we are not really geared for that kind of, I would say in two years, you're not going to have the entire China shifting up here, actually.

Sunny:

So in the last week we have actually gotten request from WIFIA, the EPAs funding arm as such to actually express letters of support. The American Water Works Association has indicated to us to

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express letters of support, saying that don't put stringent, I would say, requirements just because it's going to drive up the cost, and it will eventually delay the schedule as well. So going to your point, even though it's a long answer, I don't think we are going to see that kind of a drop happening in the next few years, because the amount of manufacturing in America to gear up, is going to be so huge, because a lot of these, I would say, supply chain is right now coming from, if you look at manholes, they come from India, if you look at some pipes, they come from China. So to even bring those factories here, it's going to take a long time for us to, I would say, have that kind of a manufacturing base.

Catherine:

Thank you for that.

Larry:

Catherine, I would like to add on to a couple points that Larry and Sunny made. As we were considering the Whitney Dam in previous capital plan, five and 10 year capital plans, the assumption was that, that was a solid interior. And when they got into the design work, they found that it was this loose rubble that Larry Marsik mentioned. So that has been a contributor into the escalating cost of moving forward on the dam project. So there was a factor there that we were not aware of.

Larry:

Secondly, to Kevin's point, the individuals that are most actively concerned about this project, some of them are the same ones that were deeply involved in the construction of the Whitney Water Treatment Plant. And I don't know if anybody on the board was here when that happened, but Tony will remember that there was an active community group that provided input all along the way as the Whitney Water Treatment Plant was being constructed. And some of their input did increase the cost, but they have an expectation that they all have at least some input, or at least have the opportunity to voice their concerns. Now that said, we can obviously make the decision to not take into account all of their conduct, but these people do have an expectation of some sort of involvement just based on past history.

Catherine:

Thank you, Larry.

David:

Suzanne.

Suzanne:

Thanks, David. And thanks everybody for the information. Couple of questions. I know that you had a thumbnail estimate based on a previous dam, the other two dams that you find somewhat irrelevant now. Are there any other projects going on in the state that you think are comparable to what we're doing right now or in surrounding states, and how much it's costing them to do it?

Larry M.:

I don't have that information, but that's something that we can get.

Sunny:

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Suzanne, that I think, we have looked at many dams. I think Larry actually did a lot of, I would say, research on the design end of it. I think we looked at all the other dams, not only I would say, in the state, we have had, I would say, a couple of experts who is part of the team who has been providing us a lot of technical input and cost optimization and design optimization, that if you want to expand on, I would say the gentleman who is helping us out, maybe that, I would say, not exactly on the cost, but on the design optimization and the approach we are taking a little bit.

Suzanne:

But not necessarily current projects underway and understanding what they're going through to do it with costs?

Sunny:

Yeah. I mean, Suzanne, not just on the dam, but we look at it overall, whether it's going to be resteel concrete, because predominantly this is going to be a reinforcing steel and concrete work, more so than anything else. So you're going to build a massive concrete upstream or downstream. And a lot of, I would say, general construction work. So we do have, I would say, a very decent idea, because those kind of works do keep going on across the state. And I think those numbers will dictate.

Sunny:

And that's where the input comes in. Specifically dam wise, some geotech work, specialty might be required. And this grout work which Larry mentioned, is a specialty contractor work. And that's one of the reasons why we want to explore the grout to see whether... Because at this point of time, that grout is a very, I would say, black hole at this point. We are not sure exactly how much of grout would be required and what kind of grouting operations would be required. And that's where we have this elements of two million there, because that is something, a beast, that we can't quantify at this time.

Suzanne:

My next question is, I thought I understood that the downstream building of the dam with a somewhat appealing facade, was the direction that we were going. And is that the downstream concrete buttress, or is that something-

Sunny:

Right.

Larry M.:

Yes.

Sunny:

Yes.

Suzanne:

And I think I also heard you say that the original plan for what you were thinking, the costs are starting to get unmanageable. Therefore, you want to rethink the design to look at other alternatives, but that doesn't jive with what the chart is on the last slide about cost. So I think maybe I'm misunderstanding what you said.

Sunny:

The original idea, when we actually relooked at the downstream buttress option with an artificial facade that reflects the existing facade, is the one that we are actually prioritizing as number one. So, the other option which was originally thought of say whatever, a year ago, was the one was an upstream option with the cofferdam along Davis Street. That is the more expensive option. In lieu of that, our number one option at this time is to look at the downstream option.

Suzanne:

So, why are we exploring all these other options at this stage of the game? Is this just a matter of process and protocol, or did something come up that made you change your perspective about your direction?

Sunny:

The six options that's listed out there?

Suzanne:

Yeah.

Sunny:

The six options, I think it was part of the original whittling down of the 30 to six. But out of that, if you look at most of those options, we may not even pursue it. So it's there given as file listed six listed options, but those options have many different concerns. So effectively, we may be looking at only two options, and one is the upstream option with the Davis Street cofferdam. And the second option, which is our ideal option, would be the downstream one. The other four options are there, they're all modifications of the upstream option. As Larry said, it's not entirely completely different options.

Sunny:

It is just the upstream dam could be right adjacent to the existing dam, or the upstream dam could be a little bit, I would say, two feet farther away from the existing dam. So those are all modifications of the upstream version, but not necessarily brand new ones. So if you look at the upstream option as one single option A, and the downstream option as one single option B, ye has sub options. So ye has A1, 2, 3, 4, and B is just one option. So out of the six options, most of the upstream options, you can just club them into upstream and there'll be different variations of doing it. So effectively, we have only two trees. One is the downstream, and one is the upstream.

Suzanne:

Okay. So when you present it to the board, the downstream option in a previous presentation, it really was not the plan. It was an option of a plan, and you weren't done planning yet, is that correct?

Sunny:

Even during the board presentations, when we look at the budgets, we actually took only the downstream option as our ideal option. But the ideal option has a huge bottleneck with regard to SHPOs approval. That is a bottleneck we are not sure how we are going to satisfy and suffice, I would say their interests, their check boxes of what they're going to make us to do. Our ideal option would be the downstream. And even the budgets are actually budgeted for the next four to five years based on the

downstream option. So that's the ideal option we presented during our budget presentations as well. Even now it exists as our top option, but if they don't really allow us to do it, then we have a default of upstream.

Suzanne:

Okay, which leads us back to Kevin's question about SHPOs impact on our decision making.

Sunny:

Correct.

Suzanne:

Right. And okay, that's interesting. And as an authority, well, we can talk about that offline. Another question, just a little different is, we always have contingency in our costs in the \$5.9 million that you're asking for not to exceed. Is there anything that's a contingency if these estimated costs or the 5.52 doesn't come in as you expect?

Sunny:

Right. This 5.52 is almost design fees related stuff. So I don't think there's any contingencies kept in it. If you look at the \$38 million that you presented for the construction, that includes a 30% contingency in it. So this one, the only contingency, if you want to call it a contingency, would be the \$2 million we have kept for the grout, which we may or may not use it. So if you knock off that out of 5.52, if you knock off the two, technically the design fee will be around, say 3.52.

Suzanne:

And what's the RWA \$400,000 in fees?

Sunny:

Typically, our internal costing for both the design and construction, we calculate our early cost, and that becomes part of our budgets too.

Suzanne:

Okay. All right, thank you.

David:

That way we capitalize what would be operating expenses as salaries that are involved in the project. Is that right?

Sunny:

Correct.

David:

Okay.

Kevin:

David, I quite do have one follow up-

David:

Sure, Kevin.

Kevin:

I do have one follow up question. Sorry. Yeah. And thank you again, Sunny and Larry and other members on the authority, and those great questions. This might be more of an academic question at this point, but Suzanne's question had reminded me that we had seen a potential option at one of the previous meetings in the recent past, and that's the preferred one, because it looks nicer. I'm just paraphrasing, but this is my understanding. So that's the preferred one, because it looks nicer and that's the one that maybe SHPO and the neighborhood is going to like, and it keeps the traditional architecture look and feel of the dam, but what policies or procedures are in place. And I know that everyone involved in designing this, is one of the top people in the profession, including Larry with his dam experience, but what is the policy and procedure if there is one in place that prevents some type of bias, because we're starting off with an idea that this is the one we like the best.

Kevin:

And I'm not saying that this happens intentionally or even unintentionally, but do we back into this final answer, because this is the one we started off liking the best? Or how do you, during your process, make sure that the bias of the one that we like the best, or we think we like the best, doesn't just by default become the one that is presented. Is there a procedure in place that helps knock out the biases or eliminates those biases?

Sunny:

Absolutely. I think, normally during the design process, typically it's looked at for structural issues, it's looked at for seepage issues. So the fundamental ideas that drive any of these options, would be to address the structural challenges, the hydraulic and hydrologic challenges, so geotechnical challenges and the constructability challenges. The architectural facade is something that we will have to take into account, and that's one of the reasons when Larry mentioned that the interactions with the community members will happen, but they're going to address issues related to most of the other issues, but the design itself will be driven by the soundness of design to address future floods, climate change issues, seepage, structural stability, and things of that sort.

Sunny:

So that will be the fundamental design parameters for any design project or any engineering project. And they're not going to change for this one as well. So sound engineering would be the process upon which the alternative will be selected. And even looking at this downstream option, this is the best sound design engineering alternative, even when we looked at earlier than two, three years ago. But unfortunately, the architectural portions of it, took a precedence. And we had to walk away from this alternative, even though it provided one of the best alternatives for design. So in terms to answer your question, for any engineering and design related issues for extending the life cycle of a dam for addressing any climate change, flood related, hydraulic, hydrologic, the downstream would be the better option of all the other options.

Sunny:

The only disadvantage in this case, would've been the facade. So in every way, this actually check boxes every other alternative in actually helping the environment, because we don't really have to lower the upper basin in that much. It helps out in many different ways, the construction can be reduced. So if you look at it holistically, it actually ticks off many boxes. The only negative with this option was the SHPO itself. So that's the procedure that's going to govern where the design and engineering are going to be guided by design and engineering, what's the right structural stability providing option, what's the best for hydraulics of it, rather than anything else. So in that way too, Kevin, I think this is the best option out there.

Kevin:

Okay. Thank you.

Suzanne:

It certainly speaks to making sure that we get SHPO on board with whatever we're doing. And I don't know what that takes and how involved that is. I have just one last question also. Is there any reason why we're going for an approval of 5.5 rather than a 3.5 with a \$2 million alternative? I just want to make sure that the project for design doesn't exceed the 3.5 if in fact we don't do any grouting trial.

Sunny:

The reason why we are asking for 5.52 is because we just wanted to have it, because sometimes, if we are able to fine tune the design based on how the grout trail program runs, we will have to fine tune the design. So that's the reason why we are asking it, because otherwise we'll have to come back again and then there'll be a stop in the design. Go ahead.

Suzanne:

Sunny, I'm sorry to interrupt you. I don't mean to not have the \$2 million in there, but if we don't need to do the grout trial program, what I don't want to see is the design end up turning out to be \$4.5 million, because you had a, do not exceed a 5.5.

Sunny:

At this point of time, I think we are confident that we should be able to complete the design at 3.52, including the 1.9 we've already spent.

Suzanne:

So I guess, David, the question really is for us as an authority, was there not a reason to do this in a two-step? I don't mean two steps as do one now, do one later, but to say design for 3.325, and then \$2 million for the grounding, if needed.

David:

Well, that's what it does say, and we're relying on management to follow their normal course of business, which is to spend only what's necessary to spend. The guidance I've been given in unofficial conversations with RPB members is, make this once not twice, so don't come back if we decide we want to do the \$2 million for a separate one, but also, we will know, because we will get updates from management as to how this is progressing and whether they intend to spend that \$2 million to further what the alternatives are, and explorations that they may or may not need.

Suzanne:

Right, I know, but I want to make sure we're saying the same thing. I'm not saying take out the grout trial for the \$2 million. I'm saying that we just talked about contingency and no need for contingency inside of planning in design, but really contingency is used for construction. So if there is no need for contingency, then we should be highly confident that our \$3.5 million is good for design, and that the \$2 million can be allocated to the grout program. So I feel like my concern is noted. And so, when we get to that point, and we can work under the 3.5, is what my expectation is, than if we don't have to do the grout trial.

Larry:

Suzanne, are you suggesting that the \$2 million in essence be shown as a contingency to be allocated in the event design becomes a little bit more than expected and, or applied to grout to the grout trial?

Suzanne:

I don't know that we have to do it that way, I'm just saying, what's going to prevent that from happening? I'm just asking that question, what's going to prevent you from spending \$5.5 million on design and not having a grout trial program in this? Nothing says \$2 million has to go to the grout trial program. That's just what you're sharing with us, but it's a big number. Am I not being confusing?

David:

I don't think you're being confusing. I think as a board, we've always understood the authority spends only what they need to spend and not more. And I think by highlighting it and bringing it to our attention, it's certainly something that we're going to keep more of an eye on that we might have otherwise. But I don't know that we've often tied management's hands in a way that says, "Well, it's almost contingency. You pretty much have to come back to us if you're going to spend more than that." We're saying we expect the design to come in around \$3.5 million, and we're highlighting that now. It always was part of the project in my mind, but we're just highlighting it now. And if it does come in at four, four and a half million dollars and they didn't do the grout testing, then there'll be an explanation for that.

Suzanne:

That's a margin for error. That's big.

Rochelle:

If I could just make a comment, we do report quarterly on projects, both to the authority as well as to even the RPB Finance Committee on RPB approved projects.

Suzanne:

I understand that. And there's no question in my mind that everybody at RWA is going to do their very best to keep costs under control and do all that kind of stuff. But we have a process here, we're saying not to exceed \$5.5 million. So I think we're serious about not to exceed \$5.5 million. However, of that \$2 million is for grouting. So really what we're talking about is a not to exceed for 3.5 for the planning. So in my opinion, that's what the planning should turn out to be, but everybody else is like, "Well, but if it goes to 4.5, because that's the way it goes, that's the way it goes." And that sounds a little loose for us.

Catherine:

I would agree with Suzanne, that it is a large margin of error. I do think that this project given the lack of understanding or complete knowledge of what exactly is inside that dam, look, I did this kitchen renovation where, when they opened up the walls, we learned more. So I understand the concept that there may be a need for some wiggle room, but I also do understand that say, if we go from 3.5 to 4.5, that's a 30% increase and that's a big swing, I would just say. So I don't disagree with Suzanne's concern. I don't know how we cap the, do not to, not to exceed number, and address whether or not we're going to do the grouting as necessary. Or actually, it's a grout trial, it's not even the... That's a lot of money.

Suzanne:

Well, it's a lot of money inside the 5.5 not to exceed. So that's why I'm concerned, is that A, we don't know that it's necessary. And B, I know we don't want to come back for it, and I get it, so keep it in there, but really what we're talking about is two things here. We're talking about not to exceed in the plan of 3.5 [inaudible 01:08:45] 20, and not to exceed the grout trial program of \$2 million. And that's why I asked about contingency and planning, because I agree with what Catherine just said and what I'm sure everybody who has built anything knows in terms of design process, is that you can discover things and say, "Oh, well we want to now test X, Y, and Z, which we didn't think we had to test before, before finalizing our plan, because we discovered what's behind the wall, behind the stove." So at the end of the day, I understand that, but that's why I asked about contingencies. So I just would like to understand, is it our expectation that the plan will not exceed 3.5?

David:

That's my expectation. And if it does, I think we will have to have an explanation. To take one item, if it costs more than \$200,000 to get the contractors in early, maybe they won't do the \$50,000 fee that was mentioned, maybe it'd be a little bit more. I would think that we would be given an explanation when we get our updates on the project that, "Gee, an aspect of this cost a little bit more." But we don't want to slow things down, we want them to continue going. And quite frankly, other than the size, this is no different than any other project we've done. I do understand the dollars get larger and therefore it's a little more scary, but I think the trust in management to do the right thing is still there in all of our projects, that all have this.

Suzanne:

Okay. All right. So as long as we understand that the \$2 million for the grout trial is not a contingency for the planning. It's not an overflow. Okay.

David:

All right. Good concern. Thank you for voicing that. Other concerns or questions among authority members? There are some motions in here, some regarding confidentiality, because of the nature of this, we didn't talk about the confidential items in the specific design areas, but certainly we know enough about them being on the authority. Is your pleasure to move forward with this and making an application under the expedited plan to the authority? In case we do this, they're planning a finance committee meeting for next week to report on its completeness.

Suzanne:

I also don't want to throw a monkey wrench in the process, because I know you're looking to move forward, but I do think I remember, because I was a part of the expediting plan, was really more for projects that were highly predictable, not complicated, not with a lot of unseen, whatever. So are we comfortable that this project meets those standards? Or am I not remembering that correctly? Who did I work on that with, Kevin, Tony?

David:

With me.

Suzanne:

It was you David, that's right.

David:

Yes. Yeah. Yeah. Tony appointed you and I. I'm comfortable, and Mario is comfortable that it meets the criteria of that, because I've discussed this with him. And so is Tim Slocum, Chairman of Finance, to accommodate, because of the nature of the fact that we don't want the project to stop, we want to keep moving. And that has an emergency component to it if you will, although it's not really an emergency, I just don't think it makes sense to stop the planning on this, because it's critical.

Kevin:

And David, we also going to be submitting the CIS application at the May Authority Meeting. So we didn't want to have those applications bump into one another in essence.

David:

Right.

Speaker 12:

And I'll also add, I mean, this is just limited to design, so we thought that was more straight forward. We're not envisioning doing expedited process for the entire project or for the construction part of the project.

Suzanne:

Thank you, everybody.

David:

But for the size of this, it would be an ordinary project moving along within our own budgets, and not need to go forward. All right, other questions or comments? Good discussion today. Thank you.

Speaker 12:

David, there is a financing resolution also.

David:

Right. So there's a resolution regarding the application, regarding the confidentiality and regarding the financing. Would somebody like to make those as one motion approving this overall project?

Tony:

So moved.

David:

So moved by Tony. Is there a second?

Catherine:

I'll second.

David:

Second by Catherine. All right. Is there further discussion regarding this significant project? All right. Seeing... No. Seeing-

Suzanne:

I would just say for the record that the board has reviewed this extensively, discussed the various reasons why this was put forth and has come to the conclusion that at this point, this is money well spent prior to the construction of a complicated project that has a lot of key stakeholders in it. Thank you.

David:

A very good comment. Thank you. All right. Other questions or comments? All right, sensing you're ready to vote. All those in favor, signify by saying aye. Aye.

Group:

Aye.

David:

I heard five aye's. So it passed unanimously. All right, thank you folks. I know it's tough to get a special meeting together, and this is an important project, and the RPB has agreed to move forward with this in the expedited manner. And that way we're not overlapping with other projects that need to keep moving as well. So thank you all for getting together this morning. Management, thank you so much.