Buckman Direct Diversion

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AGENDA

The City of Santa Fe
And
Santa Fe County

Buckman Direct Diversion Board Meeting

THURSDAY, DECEMBER 7, 2017
4:15 PM
SANTA FE COUNTY ADMINISTRATION BUILDING
COUNTY COMMISSION CHAMBERS
102 GRANT AVENUE

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF AGENDA
4. APPROVAL OF CONSENT AGENDA
5. APPROVAL OF MINUTES FROM THE OCTOBER 5, 2017 BUCKMAN DIRECT DIVERSION BOARD MEETING
6. REPORT ON DECEMBER 5, 2017 FISCAL SERVICES AUDIT COMMITTEE (FSAC)

INFORMATIONAL ITEMS

7. Monthly Update on BDD operations. (Michael Dozier)
8. Presentation on Los Alamos National Laboratory Clean Up Efforts. (Charles Vokes, Kyle Harwood and LANL) **VERBAL**
9. Status Update on Water Reuse Strategy, Planning and Implementation. (Kyle Harwood, Bill Schneider and Rick Carpenter)
10. Report from the Executive Director. (Charles Vokes) **VERBAL**

CONSENT AGENDA

11. Request for approval of the 2018 Buckman Direct Diversion Board Meetings Calendar. (Stephanie Lopez)

12. Request for approval of the 2018 Fiscal Service and Audit Committee (FSAC) meetings calendar. (Christi Manzanares)

DISCUSSION AND ACTION

13. Request for approval of payment to the Bureau of Land Management in the amount of $74,565.65 for BDDB Right-of-Way rental fees.(Mackie Romero)

14. Request for approval to file an application to convert to perpetuity, the BLM Right-of-Way permits for the BDD Project. (Nancy Long)

15. Request for approval of Amendment No. 5 to the Professional Services Agreement with Alpha Southwest, Inc. for the Raw Water Lift Station pump rebuild project for the amount of $120,000.00 exclusive of NMGRT. (Mackie Romero)

    a. Request for approval of a Budget Amendment Resolution to authorize funds from the Major Repair and Replacement Fund to cover the cost of the project.

MATTERS FROM THE PUBLIC

MATTERS FROM THE BOARD

NEXT REGULAR MEETING: Thursday, January 4, 2018 @ 4:15pm

ADJOURN

Executive Session

In accordance with the New Mexico Open Meetings Act NMSA 1978, §10-15-1(H)(7), discussion regarding threatened or pending litigation in which the BDDB is, or may become, a participant, including without limitation: Discussion regarding Diversion Structure issues. (Nancy R. Long)

End of Executive Session

PERSONS WITH DISABILITIES IN NEED OF ACCOMODATIONS, CONTACT THE CITY CLERK'S OFFICE AT 505-955-6520, FIVE (5) WORKING DAYS PRIOR TO THE MEETING DATE

MINUTES OF THE

THE CITY OF SANTA FE & SANTA FE COUNTY

BUCKMAN DIRECT DIVERSION BOARD MEETING

December 7, 2017

1. This meeting of the Santa Fe County/City Buckman Direct Diversion Board meeting was called to order by Councilor Peter Ives, Vice Chair, at approximately 4:20 p.m. in the Santa Fe County Commission Chambers, 102 Grant Avenue, Santa Fe, New Mexico.

2. Roll was called and a quorum was present with the following members present:

BDD Board Members Present:
Commissioner Henry Roybal, Chair
Councilor Peter Ives
Councilor Michael Harris [Alternate for City]
Ms. Denise Fort, Citizen Member
Commissioner Anna Hamilton

Member(s) Absent:
Councilor Carmichael Dominguez

BDD Board Alternate Members Present:
Commissioner Anna Hansen [County alternate]
Mr. J.C. Helms [Citizen Alternate]
Mr. T. Engelhoff [non-voting]
Ginny Selvin [Las Campanas non-voting alternate]

Others Present:
Charles Vokes, BDD Facilities Manager
Nancy Long, BDD Board Counsel
Kyle Harwood, BDD Consulting Counsel
Mackie Romero, BDD Financial Manager
Bernardine Padilla, BDD Public Relations Coordinator
Michael Dozier, BDD Operations Supervisor
Christi Manzanares, BDD Administrative Assistant
Debra Harris-Garmendia, BDD Fiscal Administrator
Stephanie Lopez, City of Santa Fe Utilities
Daniela Bowman, BDD Regulatory Compliance Officer
Bill Schneider, City of Santa Fe
Stephanie Clarke, Santa Fe County Finance Director
Michael Kelley, Santa Fe County
John Buchser, Sierra Club & City River Commission
Joni Arends, Concerned Citizens for Nuclear Safety

William K. Butler, County Resident
Lovita Vandenberg, County Resident
Scott Vanderberg, County Resident
John House, County Resident
Cheryl Vokes, Citizen
Amy Ewing, Daniel B. Stephens & Assoc.
Doug Hintze, DOE EM-LA
Ben Underwood DOE EM-LA
Steve Horak, DOE EM-LA
William Mee, Agua Fria Village
Beth Beloff, Northern New Mexico Citizens Advisory Board

3. APPROVAL OF AGENDA

COUNCILOR IVES: Staff, are there any changes to the agenda?

CHARLES VOKES (Facilities Manager): No, Mr. Chair.

MEMBER FORT: Mr. Chair, this is a question. In general, we have comments from the public – matters from the public following our discussions. Is it possible to have comments from the public on some of the agenda items which are here today before the end of the meeting. That is before we conclude our discussions on them.

COUNCILOR IVES: I certainly have no problem with that. Let me just ask for a consensus of the Board. And I'll look to counsel to see if there are any notice issues.

NANCY LONG (BDD Board Counsel): Mr. Vice Chair, I don't believe there's any notice issue. It would be a discretionary matter as to whether you would want to take public comment at different points in the agenda.

COUNCILOR IVES: And let me ask Member Fort, are there particular items that you had in mind?

MEMBER FORT: In particular, item 9 is one of them and Commissioner Hansen might have – do you expect members of the public to comment on – I'm putting you on the spot – on anything other than the City's proposed so-called water reuse project?

COMMISSIONER HANSEN: I believe there might be members of the public that would like to speak about the LANL presentation.

[Chair Roybal arrives.]

COUNCILOR IVES: Let me just turn it back over to our Chair. We took roll call and had a quorum and we had asked if there were any changes to the agenda from staff and then turned to members of the Board and member Fort had inquired whether it would be possible to have comments from the public on different items as we were moving through the agenda, Counsel advised there was no notice issue involved with that so we were just discussing what matters might be subject to that type of opportunity. So with that, it is all yours.

CHAIR ROYBAL: Commissioner Hansen?

COMMISSIONER HANSEN: I would also like to second what Member Fort suggested that we could do public comment after each presentation – number 7, number 8, number 9 – I don't know if there would be any public comment after the BLM

presentation. I have a number of things that I would like to speak to about that. I think that's it.

CHAIR ROYBAL: Was that a motion that you made to add or you would just like to see public comment added? How many people are here in the audience are here to speak to those two items? So we have four. Yeah, I'll allow that.

COMMISSIONER HANSEN: Thank you.

CHAIR ROYBAL: Have we had a motion to approve the consent agenda?

COUNCILOR IVES: I would move to approve the regular agenda as amended.

COMMISSIONER HAMILTON: Second.

CHAIR ROYBAL: Okay, a motion and a second. All those in favor.

The motion passed by unanimous voice vote.

4. APPROVAL OF CONSENT AGENDA

With no changes offered, Councilor Ives moved to approve. His motion was seconded by Commissioner Hamilton.

The motion passed by unanimous voice vote.

5. APPROVAL OF MINUTES: October 5, 2017

COMMISSIONER HANSEN: On page 3, nine paragraphs down, Councilor Dominguez "So Chuck, I don't even thought if this is a fair questions..." So I think it might be, "I don't even know if this is a fair question to ask."

CHAIR ROYBAL: Okay, any other corrections?

COMMISSIONER HAMILTON: Move to approve as amended.

COUNCILOR IVES: Second.

The motion passed by unanimous [5-0] voice vote.

6. REPORT: December 5, 2017 Fiscal Services Audit Committee (FSAC)

MACKIE ROMERO (BDD Financial Manager): Mr. Chair, members of the Board, a Fiscal Service and Audit Committee meeting was held on Tuesday, December 4th. In attendance was myself, BDD Financial Manager, Debra Harris-Garmendia, BDD Fiscal Administrator, Christi Manzanares, BDD Administrative Assistant, and from the County we had Commissioner Hamilton, Stephanie Clarke, County Finance Director, and from the City Andrew Ederman, Water Resource Coordinator. I provided an update on the BDD audit which has begun by our external audit firm, Clifton Larson Allen. I will continue to provide updates until the audit is complete and financial statements have been issues, at which time I will present the final report to the Board and the partners.

We discussed the proposed calendar for the FSAC meeting which was drafted not to conflict with the various meetings and committees that the Board and the partners attend. We discussed action items 13 and 15 which will be presented to the Board with no major concerns or issues.

If there are any questions or comments? Commissioner Hamilton, do you have any comments?

COMMISSIONER HAMILTON: No, that was good. There were no big issues that came up.

CHAIR ROYBAL: Thank you, Mackie. Any other questions or comments from the Board? No, thank you.

MS. ROMERO: Thank you.

INFORMATIONAL ITEMS

7. Monthly Update on BDD Operations

MICHAEL DOZIER (BDD Operations Superintendent): Mr. Chair, members of the Board, raw water diversions at the BDD this past month there were on average 3.31 million gallons. The deliveries through 4A and 5A were 3.13 million gallons. Las Campanas did not pull any water last month. Onsite treated storage and untreated storage was around .18. We are providing approximately 48 percent of the water to the City and the County, most of it was low demand so it's pretty much an even split between us and Canyon Road right now. Any questions?

CHAIR ROYBAL: Do we have any questions from the Board? No, thank you for your report, Mr. Dozier, appreciate it.

8. Presentation on Los Alamos National Laboratory Cleanup Efforts

[*Exhibit 1: The Chromium Project presentation, DOE EM-LA*]

MR. VOKES: Mr. Chair, members of the Board, we have Doug Hintze who is the environmental leader at Los Alamos National Laboratory. I'd like to mention that it has been a couple of weeks ago that Commissioner Hansen, myself and Mr. Harwood went up to the laboratory and actually did a site tour of several of the sites there and had an excellent presentation by Mr. Hintze's staff and as a result of that tour we have invited him to bring some information to the Board and to the public of the BDD. So, Kyle, did you have anything additional?

KYLE HARWOOD (BDD Contract Counsel): Good evening, Board members, just that we asked Mr. Hintze to present on two basic topics. One was to review the chromium plume contamination tour that we did and then to speak on LANL cleanup efforts in general. And so we asked him to do a 15 minute presentation on those topics. So if he misses something, it is probably because Chuck and I didn't ask him to do it. Also, we asked Doug to be open to being invited back to the Board in 2018 for various updates the Board members may have, specific requests of him but just to let you know that we have had that conversation.

DOUG HINTZE (DOE EM-LA): Mr. Chair and members of the Board, I have some handouts here. These are fact sheets that talk about the chromium project.

The chromium project has been in the news for the last couple of months, extensive attention to that so I'm going to probably go half this 15 minutes will be talking about the chromium project and then go on to the other aspects to the program up there. If you're interested in this, the fact sheet is also on our website. So you can also go the website for additional information concerning the cleanup work we have up there.

Chromium project, what we're talking about is a plume of chromium-6; chromium-6 is a health hazard. It's a result of – back in 1956 to 1972 standard practice for a lot of power plants was to use chromium to coat the inside of pipes for corrosion inhibitor. Once a day you would then actually blow down that material out into the atmosphere and environmental standards were not the way they are today, so in a lot of cases they were discharged over the canyon walls. In this case, from 1956 to 1972, approximately 160,000 pounds of chromium was discharged into the canyon. The plume, well, it wasn't a plume at that time, would go into the canyon bottom, go down about a mile, mile and a half down the canyon and then over the years it has seeped vertically from the canyon floor down into the aquifer. So right now, what we're talking about in this effort that I'm going to describe is to address a chromium plume that is on the regional aquifer. It's on the top of the aquifer. It's roughly 50 feet deep, a mile long, half-mile wide, and, again, sitting on the aquifer. Even though the source stopped in 1972, it is still seeping down the thousand feet into the aquifer. So you might have heard that there's talk about plume it's migrating. So it's migrating to the south, southeast toward the lands of the San Ildefonso Pueblo. So what we're now doing here, what I'll talk about is interim measures to arrest the plume and then we'll go several years down the road, we'll actually go in and come up with a final remedy.

Just in the last couple of months there were reports that there was concern with the water supply up in Los Alamos County. There were some inaccurate reports that the water was not safe. The plume is not in contact with – right now it is at least quarter of mile away from where the closest water supply well is. And we've been working with the County of Los Alamos, the utility department, in order to continue to monitor.

I can go into a lot more of the information. I testified before the New Mexico Committee on Radioactive and Hazardous Material and ended up there for an hour and 47 minutes. I don't think you want me to talk for an hour and 47 minutes here today but I'm also giving presentations at the Los Alamos County Council on January 9th. On the 12th for the Regional Coalition and then on January 24th with the Citizens Advisory Board. On the 16th of January we're having a public meeting on the Consent Order and chromium will be one of those items that will be discussed at that public meeting which is up in Los Alamos on the 16th in the County Council Chambers. So if I don't satisfy you here, then you know I'll definitely come back. We can invite you up. Commissioner Hansen was out there and we'll talk to make sure folks understand what we're doing to arrest this.

So the first thing I want to make sure folks understand is this is interim measures. It's a pump and treatment system. We're installing injection wells or extraction wells which will extract contaminated water, run it through an ion exchanger and then inject it back into the ground. The whole purpose of that, and you see if you look at your sheets there, is to establish a hydraulic barrier or fence such that the plume cannot continue to migrate toward the site boundary. In the meantime what we're doing is we're going back and looking at what the final remediation would be and right now we're looking at two

different solutions. One is a bio-solution of injecting molasses and the second is a chemical injection which is used in other locations in the country specifically up at Hanford site. And both of those, what they do is convert the chromium-6 to chromium-3. Chromium-3 is actually in some of your multivitamins. It's not mobile. Chromium-6 is the health hazard. So, again, the news that came out several months ago was talking about one of the injection wells, injection well 6, that we just finished in August. We then took samples and it came up with concentrations that were greater than – it's not greater than what was in our model but it was greater than what folks were expecting. We draw the plume and you have it on the sheet that shows the 50 parts per billion line which is the New Mexico standard and you can see there's a little node now for the northeast quadrant and that's because that's the location of that well, which means that that plume is further out to the east than we had drawn in the past. Now, it's not any different than what we had already expected in our model plume because that section has kind of a streaming effect, the geology in that area is a streaming effect; however, we did not do a very good jobs of folks explaining the modeling that we were using, explaining that there are variations in the model. Because one of the things that we all know is that when you're trying to look down 1,000 feet from the ground it's not like walking around a lake or pond on the surface. You do not know what the exact – what the concentrations are everywhere as you're trying to define that plume. It takes roughly, to drill one well, monitoring well or injection extraction well, $3 million to $3.5 million, and so you need to make sure you have enough information to start an action and that's where we believe we are now. We are at the point that we need to take action because doing no action is not the right thing.

So for the chromium-6, and I'll be glad to come back, in the March timeframe we have to give a report to the New Mexico Environmental Department on what we would recommend to do in that area. In the meantime what we'll be doing is starting the extraction and injection to the south because we have enough wells, enough knowledge of what's in the south and that's closest to the San Ildefonso property. So that way we can establish that hydraulic barrier there and then we'll propose in March to New Mexico Environmental Department for the northeast quadrant. I'll be glad to come back after that timeframe. Right now we're doing more testing to come up with that recommendation.

We were also asked, Kyle said, could you give us a little bit on the cost associated with this and the economic impact. So far, we have spent $76 million over the last three years. It's roughly $40 million for the personnel cost, $35, $36 million for the equipment and/or the drills and the material costs. We expect that – this is the number one priority that we have for our entire program so we have the flexibility as we come up with new information to shift money to this. For example, this year here, we were only planning on doing three extraction wells. We found out that we were not able to pull up the amount of water that we wanted to to inject back in, so we are now drilling a fourth extraction well. I talked about this year going back in March, I guarantee you that the activities that we're going to propose in March are different than in our current work plan so that being said, it's probably going to be more money and that's not to find a remediation. I talked about the two amendments, the chemical injection or the molasses; we are expecting that we will continue to test for that for probably three to four years. So we won't start the final remedy until probably sometime in the 2022, 2023 timeframe.

When you look at the Consent Order these are separate campaigns. The first campaign is to do the interim measures; second campaign is to do the final remediation. All of that will be part of a public participation process for the final remediation through the New Mexico Environmental Department processes and procedures.

Economic impact, other than just straight the money, we haven't really decided or determined the exact number of positions or people that have been impacted by the money that we have spent for the simple fact that over a three year period, people have come and gone – the drilling and so forth is all subcontractors so we're still going back to look at exactly how many people were involved in the project over the last three years.

So that's all I was going to talk about for the chromium project. I don't know if there's any questions right now, if not, I'll go into the other parts of the cleanup program up there.

CHAIR ROYBAL: Okay. I think we do have some questions. Councilor Ives and if there's any other questions, yes, Member Fort, we'll go to you next.

COUNCILOR IVES: First of all, thank you for being here and thank you for that report and the good work that is being done on this. One question I had, you characterized it as roughly one mile long, one-half mile wide; how tall?

MR. HINTZE: So this is one of the things that we say that makes it a little bit easier. The plume is roughly 20 to 50 or 60 feet deep and it is sitting on top of the aquifer. So that makes this whole project a lot easier. Also, when you talk about water supply wells, they're screened, they don't draw water until about 1,000 feet down. So right now we have both horizontal and vertical separation from the water supply system. But, again, being on the top of the aquifer like I say at roughly 50 feet deep. And, again, we try not to do the point because then people get in their mind that you can actually see what the plume looks like there and it's very difficult to say that. Some locations might be 20 feet deep, others it might be 60 feet deep and so what we recognize is for the final remedy it's got to envelope any of the situations to make sure that – in additional to size, migration, we also recognize it is still be added to from the seeping of the chromium down through the 1,000 foot layer. Simple answer, 20 to 50 feet deep on top of the aquifer.

COUNCILOR IVES: Okay. And any sense how far up to the surface it is still –

MR. HINTZE: A thousand feet.

COUNCILOR IVES: -- trickling down from?

MR. HINTZE: And that's one of the things you will never be able to measure that because that being the vadose zone you don't know how much exactly is still left in there. So the final remedy actually has to assume that that will continue to drip into the aquifer for years and you have to have a solution that will take care for that continuing time.

COUNCILOR IVES: And I know that the fact sheet said that it was in the top 100 feet of the aquifer which suggests that it continues to migrate downward.

MR. HINTZE: We haven't seen any of that. It is just that there is a mixing layer. It's not like – it's like when you have oil and water together, there is some mixing there. But, again, most of it is sitting on top of the aquifer.

COUNCILOR IVES: That's all I had.

CHAIR ROYBAL: Thank you, Councilor Ives. Member Fort.

MEMBER FORT: Mr. Chair, thank you, as well for coming. Is the legal authority under which the cleanup is being conducted then the consent order?

MR. HINTZE: Yes, yes.

MEMBER FORT: And what is the pueblo's participation in that?

MR. HINTZE: So we have an ongoing program with the pueblo which helps to fund their environmental department. So everything that we're doing in regards to any of the cleanup up there because of the downstream effect, we have the pueblo – and all of the information, we take all of the samples that goes to them. We actually with this project here with the New Mexico Environmental Department coordinated with the pueblo to site a monitoring well on their land. So the area where this plume is hitting toward is their sacred area; not where the housing is but where they do the hunting. That well on their land which is about a quarter of a mile from the site boundary has only background up to this point here.

MEMBER FORT: Thank you.

CHAIR ROYBAL: Thank you, Member Fort. Commissioner Hansen.

COMMISSIONER HANSEN: So one of the questions I have is with the wells and going through the plume down into the aquifer; is there a possibility that then more chromium hexavalent is being released lower down into the aquifer because of the wells – because of the drilling?

MR. HINTZE: Yeah, correct, yeah. And the answer is no because one of the things that we make sure when we're putting in the different wells is where we are locating the screens because what you do not want to do is exactly like you're saying, having the potential of cross-contaminating either between different aquifers or within that aquifer. So for example, all of our monitoring wells and they are limited normally to that top 100 feet layer which is how we've identified that that's sitting on the top layer. What we've also done for example is up near the water supply well for Los Alamos we have two sentry wells. So what we did with those two sentry wells is we have screens. One screen that is up at the top which is where we anticipate that if it did eventually get to from a horizontal that it moved over to where the well was intake we would see it through that sentry well. We then have another sentry well with a screen that is down where the water supply draws about 1,000 feet into the aquifer so that way we would see if the plume did get down to that level.

Everything that we've had so far with our wells and the placement of the screens indicate exactly like we were talking about that all of the plume is up at the top of the aquifer. So we are very careful not to cause cross-contamination because of the wells.

COMMISSIONER HANSEN: So this 50 feet deep plume is not leaking or it is seeping possibly into the aquifer – it's sitting on top of the aquifer and so why is it not moving into the water below or the aquifer below?

MR. HINTZE: Right, so what you have is – you have matter, what's the geology that's there; what's the constituents of the contamination and so forth. And so from what we are seeing from our samples so far we're not seeing anything that indicates that it is seeping down from the top of the aquifer. If it does, then we understand that part of our final remedy has to be able to make sure that we can address it at whatever level that it may be. It's not just going to be a matter where we say, okay, it's sitting there on the top so we're going to come up with a solution that just addresses the top 20 or 30 feet. We're believing that the final remedy may have to be both a vertical and a horizontal

system like we were talking about injection of molasses or the chemical. So we understand that there is that possibility and we have to address that as well.

COMMISSIONER HANSEN: So is there any way to remediate above the plume where there might be soil or whatever above the plume that can start to change the chemical makeup of the hexavalent chromium that is in the ground above the plume that we're expecting to continue to move down into the plume?

MR. HINTZE: So when you look at – and I talk about 160,000 pounds of the chromium where it was released over those 16 years, we estimate that the amount that is actually getting down into that aquifer is about 2,000 pounds and the reason is exactly like you're saying. The way that you address the issue is you convert the chromium-6 to chromium-3. The natural soils that are there and conditions there have converted most of the chromium that was released from chromium-6 to chromium-3. So exactly what you're talking about but at some point the ground, you know, it gets worn out and so it can't do that conversion anymore. So there's really not a way that we can see that we would be able to address it as it's going through the vadose zone it is just that we have to be aware that, other than what's occurring naturally, other than that we are planning on addressing it as it gets down to the aquifer.

COMMISSIONER HANSEN: All right. I only bring this up because I was sent some information about possibly soil remediation. I know that it can't just be me that has thought of this. So I want to know if there's things that you can do up above the plume that, you know, you could put some bacteria or – you know, I'm not a scientist so forgive me – but that can start to transform the soil where the chromium-6 is and the soil is worn out and revitalize that soil so that it can be working for the benefit of transforming so that we can get ahead of the plume getting larger.

MR. HINTZE: I understand exactly. We've been working with the companies throughout the country who have addressed chromium plume, the ones out in California. I'm not aware of anything in that. You can imagine, you can't for example, inject molasses into the zone which doesn't have water. So there may be ways to do that, I'll go back and talk to the entire staff. But right now I'm not aware that there's a way to address it especially when you're talking about the extent and the depth. We've gone and talked to the oil and gas industry on drilling and a lot on how you would address it, and there's a lot of complications not just when we're talking about it being the vadose zone but also the geology that's there. But we'll go back and talk about it.

Our view and I think everyone here has the same concerns that we need to address this and we need to take care of it. And we need to do it as swiftly as possible. If there's a solution that is out there that we are not aware of right now then we would by all means love to see anything.

COMMISSIONER HANSEN: I'm going to give you this. I don't know if it's even relevant but I'll give it to you to read cause you can figure out what it says way better than I can.

MR. HINTZE: We've got all the experts back there.

COMMISSIONER HANSEN: One other question I have, the other concern is the perchlorate plume. I know that it is no longer on the images and that you said it is not there because it is now beneath the drinking water standard for New Mexico. But that doesn't mean that the plume can't change. And, really, in transparency it would be really good to leave that plume on these maps so that people who do know about that

plume do not feel, like oh, they've removed this plume and, you know, it should still continue to be monitored because the chemical condition of the perchlorate can change. And it could become higher than the drinking water standard and so I think it would behoove you to be more transparent by keeping that plume that is right next to – inside of the chromium plume in the pictures and explain to people that this plume at the moment is below drinking water standards and that – so that people know that you're not hiding something.

MR. HINTZE: Understand.

COMMISSIONER HANSEN: I just think it's to your –

MR. HINTZE: That's a good point. In all of the information that we get from all of our samples whether it's the chromium, perchlorate, nitrates, all of that is put in a public database Intelius. And what we try to do and when you look at different ones of these sheets we try not to overload folks. All of the information is available and depending on the presentation we'll have ones that have – just like when you were up there you saw the chart that we had that did show the perchlorate on there. So that is not by any means trying to hide. That is a publicly available chart. It's just that in a lot of cases depending on who the audience is, we don't want to overload folks.

I agree with you, we don't want to hide anything because one of the things about our program is, I've yet to have anybody disagree with our program objectives of cleaning up the environment and disposing waste. So really it only comes down to the questions of how quickly can you get it cleaned up and how clean is clean. So we're welcome for anyone to help us do that so. I'll definitely take that back there and one of the things we also need to do is make sure that when you see our website or facebook or things like that that we get that feedback because we want to make sure that folks out there get that information. We certainly don't want to hide it from anyone because just like you folks we're all part of the community too. And we know this is a hazard that we need to take care of so we'll definitely take that onboard.

COMMISSIONER HANSEN: And then, you know, as many people feel that 2023 is quite a ways out there; we're talking five years, if my math is correct. I would love to see something happening quicker than that. It's a frightening situation as I have said before about this plume and for various reasons and so the sooner you can come up with a final solution I think the better the whole community is going to feel about it.

MR. HINTZE: I agree with you and I think everyone in the community would also agree that you don't want to do a half solution and then make it even potentially worse. So that's why – originally, this campaign was a single campaign to get to the final remedy and that's why it was broken up into the interim measures to say we know that we need to take care of it and that's why we need that time to get there. And if it's 2021, we'll do it in 2021 and we're going as fast as we can but what you don't want us to do it because then you would – and everybody would, you know, rightly come back to me and say why are you doing it only half right. And we're not going to do it that way. We're going to do it safely and we're going to do it right. And you other point, we are going to do it transparently.

COMMISSIONER HANSEN: Thank you.

CHAIR ROYBAL: Councilor Harris and then we'll go to Member Helms.

COUNCILOR HARRIS: Thank you. Chair. So, Mr. Hintze I heard you say that a commitment has been made to drill a fourth well, so this is the extraction, injection treatment injection sequence to create the barrier. So I assume your calculations because you weren't able to process as much as you had hoped that this is what you need to do really to establish the barrier that you need.

MR. HINTZE: Uh huh, exactly.

COUNCILOR HARRIS: So the barrier is not quite there; when you expect to be fully confident that the barrier is in place that really the migration for all practical purposes stopped?

MR. HINTZE: So on the southern boundary which we talked about, we wanted to start the automated completely automated extraction and injection, we want to start that now. We actually started that last year and ran it for several month and we actually started to see exactly what we were hoping, that the plume is actually being pushed back up to the northwest. So we've already started using it. We stopped now, New Mexico Environmental Department is about to give us permission to start it full time down to the south. We expected that to be going here in the next couple of months: automated, full time in the south. And then I would say in March is when we come up with the solution for the other injection, wells extraction, wells up to the north, northeast. So I would anticipate after our recommendation going through the comment process, resolution process with all the stakeholders and probably at the earliest will probably be sometime in the summer or maybe even later for that section up there.

COUNCILOR HARRIS: Thank you.

CHAIR ROYBAL: Thank you, Councilor. Member Helms.

MR. HELMS: I have one confusion and that is about the structure of it all. At the top you have the soil at the surface and then 1,000 feet down you hit the plume and then 50 feet down the plume more or less ends and then immediately comes the aquifer or is there another layer of soil?

MR. HINTZE: No, when you understand the aquifer it is soil, rocks, it is everything.

MR. HELMS: No, I understand that.

MR. HINTZE: Okay, again, when we're talking about it, don't think of it and this is where folks seem to think that everything is that well defined. If you think of an aquifer and its thousands of feet, okay, and I say it's 50 feet on the top, don't just think that it's an oil and water type complete stratification.

MR. HELMS: But when you say that the plume is on top of the aquifer, what does that phrase include?

MR. HINTZE: That means it is sitting right there up at the top of that 50 feet – right on the top. But, again, we're looking down 1,000 feet and you're not going to be able to see because, again, it might be intermixed with water –

MR. HELMS: No, I understand.

MR. HINTZE: And so that's what we're trying to say. We're probably –

MR. HELMS: But you're saying it's pretty close.

MR. HINTZE: It's pretty close to the top of the aquifer. Yeah.

MR. HELMS: Okay, that's what I wanted to know.

MR. HINTZE: All of our sampling, all of our wells, our screens and so forth do not show that it is seeping down, as Commissioner Hansen would say. It is all up at that top part of that aquifer.

MR. HELMS: Okay, thank you.

MR. HINTZE: Still confusing.

MR. HELMS: No, you've cleared it –

MR. HINTZE: -- and one of the things that we're looking at doing is putting together a video that will make it a much simpler depiction that folks can see how it interfaces, how it looks with the aquifer and so forth like that. Because of course a picture is worth 1,000 words and it's hard to describe what it really looks like unless you're one of those experts in the field.

CHAIR ROYBAL: Thank you, Member Helms. Commissioner Hamilton.

COMMISSIONER HAMILTON: I think it might help them if you describe very, very generally what is the process of vertical mixing, what inhibits vertical mixing or controls it or affects it when you get down to the saturated zone and that this stuff is going down until it hits the saturated zone that is the top of the aquifer and that there are other things that are keeping it in the top 50 feet that have to do with mixing processes in geology.

MR. HINTZE: I agree and for this –

COMMISSIONER HAMILTON: But you're not going to do it.

MR. HINTZE: -- eight minute presentation I was trying to not get too complicated and happy because again we can go and we can get all of our PhD experts and I will gladly do that for as long as we want here but I just wasn't anticipating that today. So, exactly like you're talking about because we have presentations on what the actual composition and what the aquifer is and so forth. So we can go into that but I wasn't intending to do that today.

COMMISSIONER HAMILTON: I totally understand and I think that it is good judgment but I think that there's a picture that there are boundary layers, you know, there's a zone that is the chromium plume zone and then there's the aquifer below it and I think if it was just understood that it is a whole saturated zone that is the aquifer and that this is essentially the top layer of that saturated zone but there are other things that are keeping it up there and maybe that's all that needs to be said.

MR. HINTZE: Right and we have all those pictures and others which would do that and I will gladly come back, if you would like.

CHAIR ROYBAL: Okay, thank you, Commissioner Hamilton. Any other questions?

COMMISSIONER HANSEN: I would just like to say that we would like you to come back in April after you have made your initial presentation and findings that you are working on so that we can hear where you're at at that time.

MR. HINTZE: Glad to come back.

COMMISSIONER HANSEN: Thank you.

CHAIR ROYBAL: Okay, thank you, sir.

MR. HINTZE: The only other that I would like to go on from the cleanup that directly impacts the Board and the BDD, is talk a little bit about our surface water program.

Our surface water program is roughly about $1.1 million a year and we have – part of it you saw on the MOU that we talked about here. Our focus is really on two different things. One as part is the sampling and to look at what sort of flows are coming out there so that we don't move sediment down from the LA or Pueblo Canyon and then the second thing we do is put structures in place so we can arrest the energy that comes there. So there's all sorts of barricades that are up there that we work with New Mexico Environmental Department for the shapes, locations, so forth, like that. And then the second part is that whenever we do have flows, detect those flows, make sure that we understand, you know, what is moving as a result of those flows and what the impact is after those flows go through there. Strictly from the BDD perspective, in our MOU that's a commitment that we have is that we will provide early notification of those flows that are coming there and over the last couple of years we have implemented not just for what is of interest to the BDD but for any of the surface water flows. We've updated redundancies in the systems similar to what the folks here have done. We've put in new gage stations using radar and so forth like that, state-of-the-art so that we get better and better understanding of exactly what we're doing from a surface water perspective.

Other than that, the other priorities we have from the consent order, we also have a plume of RDX. RDX is an explosive and that is in our result of the work that was done in Technical Area 16. So that plume, must lower concentration we're finding, but we're kind of at the stage of that campaign where we were on chromium probably seven or eight years ago. We're just in the characterizing stage of that campaign. But if you want to hear more about the consent order, come on up to Los Alamos on the 16th of January and one of the things that we're going to start out with is to make sure that folks understand the entire lifecycle of our program and how that translates into the 17 campaigns in the consent order, how that is then prioritized and how we're working off the highest priority of which chromium is the number one priority I have.

CHAIR ROYBAL: Thank you. Can you give us a location and time for.

MR. HINTZE: It's 5 to 7 o'clock, January 16th at the Los Alamos County Chamber in their municipal building.

CHAIR ROYBAL: Okay, perfect. Thank you for your report, sir. I guess we had four people that wanted to speak to this. You had a question, sir.

COMMISSIONER HANSEN: Maybe you should stay, Doug.

CHAIR ROYBAL: Thank you, sir. State your name and address for the record.

WILLIAM K. BUTLER: William K. Butler, 50 Koshare, in Santa Fe, New Mexico. I commend you for your interest in this particular subject. It's a very important subject as I know you know. You wouldn't be doing it if you didn't agree with that. And on the surface I am really impressed with what we see Los Alamos doing here but I know for me and I know other citizens would be interested in knowing what's the real risk that our water might be contaminated? Is there a 10 percent risk or a 1 percent risk or a 50 percent risk? It seems like it is a very complex issue and as a frame of reference we all saw a number of years ago what happened in Michigan when their water system was compromised and there were lots and lots of assurances along the way that everything was going to be okay. I think you're all familiar with that situation. But, yeah, the risk – there's a significant risk to the County and to the citizens in the event that our water is comprised. It has – we talked a little bit about the economic impacts most of

which were described as the cost of doing this which is significant. But the cost of not doing anything or the cost of allowing our water system is very, very significant in terms of imagine what might happen if all of a sudden we had a water quality issue in the County or in the City – our real estate values would plummet. What would that do to revenues? It would certainly discourage businesses from locating here. Expanding here and it might even encourage some businesses to relocate here – that's a significant impact on county revenues. And you just play that on out and tourism, a significant source of revenue for the County and for the City and for all of New Mexico: Boom, huge impact from a revenue standpoint. And then you play that out and people start losing their jobs and we have all kinds of social service issues – so my point is and I'm sure you guys are all well aware of this, but just to reinforce the importance of this from an economic standpoint.

CHAIR ROYBAL: Thank you. Do you have a response to that from anybody?

MR. HINTZE: We would say we agree exactly with that. That's why we have to address that plume where it is. You know, there's a lot of factors that go into how you have it at an aquifer when you talk of BDD as far as drawing from the Rio Grande and so forth like that. We don't ever want to get to that point because we as citizens have to pay for all of this here so that's why the quicker we can address it, the quicker we can clean it up the less impact both from a health and safety perspective and economic perspective. We understand that and agree.

CHAIR ROYBAL: Thank you.

JOHN HOUSE: Hello, my name is John House. I'm a resident of Santa Fe County in the northwest portion in District 2. My address is 4 Arriba Circle and I wonder if everyone saw there was an article on the front page of *The New Mexican* today about the LANL cleanup efforts. And you got a pretty good record from the DOE.

MR. HINTZE: I am the DOE.

MR. HOUSE: Pardon.

MR. HINTZE: I am the DOE.

MR. HOUSE: Okay, well, you gave yourself a good record.

MR. HINTZE: No, it's the contractor. You're talking about the contract award.

MR. HOUSE: Right, and they commended the efforts of the contractor and gave it a score of 76 out of 100 which I think is categorized as very good but apparently you found that the contractor was not meeting the deadlines very consistently. So one question I had is what is being done about that to improve that in the future? Second, my understanding is that according to the 2016 Consent Order the lab has the ability to prioritize measures based on its budget; I wonder if you know anything about 2018where the chromium cleanup will be in the prioritization of the budget, if it has changed or we've moved down or up perhaps. Another thing I wanted to ask, you mentioned about chromium-3 and the plan is to modify it so it becomes chromium-6 –

MR. HINTZE: No, the other way.

MR. HOUSE: I'm sorry, right, the other way, I'm sorry. And you mentioned that it is an element that is even found in our vitamins and I'm wondering, it's all about quantity and can you say how many parts per million in water is considered safe

and what kind of density or amount of that do we – when do we have to start worrying about that?

MR. HINTZE: Can I start answering some of these? Let me go back to your first question was dealing with the award for the contractors and some of the things were about missing some of the milestones. And, yep, that's exactly right. That is exactly why they only earn 76 percent because I will tell you from my perspective, the department's perspective and it should be from all of our perspectives, we would like for the contractor to earn 100 percent of the fee because if they earn 100 percent of the fee that means they're doing everything that we want them to do and more. In this case here, they didn't. They had some schedules and it wasn't associated with chromium. We had a couple of incentives as far as the remediated nitrate salt similar to the drum that caused the event down at WIPP and so they missed their dates. And to one degree, that's bad. And then to another degree, we wanted to make sure that they did it safely because safety, if we had done it safely the first time we wouldn't have been in the situation we are now. So they took a little bit more time. Missed the schedule for some of the nitrate salt processing which was completed on November 3rd, so instead of having it done a couple of months earlier, it was completed. So yep, that's exactly why they were awarded the fee through assessment of my folks. We go out there – continuous oversight.

So that's what came out to the fee. And so there are many other areas that are assessed that are the positives and sometimes when it is reported, the way it is reported or whatever only talks about the things that didn't get done. We could give you just pages, and pages and pages of things that they did get done. And so that's the result of that.

Next question was –

MR. HOUSE: It was about the budget prioritization.

MR. HINTZE: -- the budget prioritization. This campaign is the number one priority. The two priorities that we had for the contract for the last two years were completion of the remediated nitrate salts and this chromium plume. As I just said, the nitrate salt is complete, November 3rd, so now this is the number one priority.

The way that the funds are bucketed here at the site allows us the flexibility to move funds. So for example, when we talked about the extraction well, the fourth extraction well, that was not planned for in the budget originally so what we did was we put money into the extraction well in order to do that and that means that some other cleanup that is lowest on the funded priority does not get done. And so, yep, just like all of us, we're limited by the amount of funding that we do get. So if it's a higher priority which is this number one, we do more activities here, something on the bottom is going to push out to an out year. So for '18, still number one priority. This is going to be the number one priority that we will have until we finish with the final remediation.

And as far as us prioritizing, we don't prioritize the campaigns. The 2016 Consent Order, if you go to Appendix C, that is where the campaigns and the activities are prioritized. So through the process, New Mexico Environmental Department prioritized chromium, RDX, historical town site cleanup and that's why when I talk about coming here in January 16th, we'll go through the lifecycle, the 17 campaigns and the Appendix C so folks can see that we are dedicating our funds to the priorities.

The way that the consent order is written it recognizes the fact that we don't control our appropriations. That the Congress does. So you can have one of two sorts of

thoughts: one is that if I put in milestones that will cause Congress to give us appropriations or the second one is that you take the appropriations and you prioritize the money you get. That's the way this consent order is. It recognizes that we don't have control over our budget and I've been at several sites and the fact of the matter is that the regulatory milestones have not dictated funding coming from Congress. So instead of paying lawyers, we sit down and technically come up with the best use of the money every year and I personally believe as a citizen, that this is the way to do it because we're actually getting field work done as opposed to arguing and getting lawyers to have more money – I don't mean that lawyers are not important and necessary, it's just that it goes back to Commissioner Hansen's point, we need to clean up this plume and that means you need to get out there in the field and address it.

MR. HOUSE: The next question was about the chromium-3 and how much of it is dangerous, parts per million, what's safe, what isn't safe?

MR. HINTZE: So the EPA federal standard is 100 per billion. The New Mexico standard that we cleanup to is 50 parts per billion and right now the background that you have, normal out here throughout New Mexico is around 5 to 7 parts per billion, is what you'll find in background parts.

COMMISSIONER HAMILTON: For chromium-6 or chromium-3?

MR. HINTZE: I'm talking about – so the standard, the EPA standard does not separate between chronimum-6 or chromimum-3 it's just a flat out chromium measure and the reason is because you have some equilibration and so that standard is based on total chromium not chromium-6 or chromium-3.

CHAIR ROYBAL: Was there another question, sir?

MR. HOUSE: I have one other question and that is – it's not spoken about today and maybe because, I don't know, maybe it's not relevant to the aquifer, but I'm concerned about Area G. I understand that there's plutonium contamination of 200,000 cubic meters and that it extends down 240 feet into the groundwater.

CHAIR ROYBAL: I think we're kind of drifting off of the subject. We need to come back.

MR. HOUSE: I was just wondering if it is germane and if it is, where it stands on prioritization? Is that not germane?

MR. HINTZE: Area G is the area where our waste is stored. Right now, in our lifecycle what we'll be doing is dispositioning the waste that we have up there. So the cleanup of Area G cannot occur until we completely disposition the waste that is up there. So if we go back to our lifecycle we have, again, we have a strategic plan for how we're going to do that. So Area G has certain waste that by law has to be retrieved and shipped off and there's other waste that has to meet performance objectives that does not have to be, for adequate protection for the environment, you don't have to remove it. Now if we decide as the stakeholders involved, we could dig up the entire Area G, but again all of that won't be for probably about 10 or 15 years if you look at our lifecycle because the limiting factor that we have for waste disposition is the ability of the waste isolation pilot plant to take the waste. And as a result of that location shutting down for three years they have a limited ability to ship down there so we will not be able to get to address the Area G for what actually is going to be dug up for probably about 10 years. We still have roughly 2,000 drums that are above grade that we have to ship down to WIPP. They'll only take four or five shipments a week from all of the generators

throughout the DOE and so that will be a continued discussion that we have with all of the stakeholders as we get further along. But right now our lifecycle cost estimate says that we will dig up the waste that is needed, as far as law, the waste that is needed to protect the environment and then there is some cap and cover for additional that is there. So there's a lot more to come on what's going to happen to the waste, all the waste, in Area G.

MR. HOUSE: You don't see it as an immediate concern for this?

MR. HINTZE: No, all of the waste is on the top of the mesa and it has no interfaces with the aquifer or anything like that.

CHAIR ROYBAL: Okay, thank you, Mr. House. Could we have our next speaker, and if we can stay focused on the chromium, relevant to the chromium plume.

JOHN BUCHSER: I'm John Buchser, I'm the water issues chair for the Rio Grande Chapter of the Sierra Club. I am a resident of Santa Fe and live at 606 Alto Street.

I love graphs and graphical information. I think it is a great way to communicate information to the public and it is also a great way to communicate information to scientists and engineers. I would like to have the labs consider and for your consideration, showing graphs of different levels of contamination. I think the current level is around 350 parts per billion in the highest concentration area but there's no graphs. The only graph is showing the periphery at the 50 parts per billion.

So I think it would be useful to see a graph showing the lower levels and then if background, like around seven, it would also be useful to show all the way down to that level even under the New Mexico standard and potentially show that in a time line of the anticipated remediation processes and containment processes; what would happen if your containment doesn't work, how does it progress, what's the velocity anticipated of the groundwater and so on. There's some cool graphical ways to do that. So that one is just a suggestion to consider.

And I'm assuming that the threshold of measurement from a practical sense is that at least it gets down to background, that it's not an extreme difficulty – you don't need a mass spectrometer to figure this out. You can measure it somewhat easier than that.

And, my last area concern is if your best efforts drag out through budgeting or just misinterpretation of the data, as new data comes in it may turn out to be a more complex problem than is currently anticipated, I think it would be useful to the City and the County of Santa Fe to have some notion of what it would cost to treat the Buckman Wells. You know, if it gets that far and we start seeing that it is going above background levels that far away it would be good to know how much it would cost to deal with that. It might – you know, I don't think we're going to have molasses flavored water, it would be cute, but it doesn't – from the public's perspective adding molasses to the water doesn't really seem like a super bad thing as long as it doesn't taste like molasses and it takes the contaminant out. And I think it would be useful to know clearly, I think the lab could go to Congress and say we need some money to do this if 10 years from now we're in that position. But it would be useful to have some notion of , you know, will it take two or three years to build this sort of facility. How successful is the lab at getting money for this – I think the lab is going to take responsibility for it whether Congress takes responsibility for funding it is another question. So I think in the future as this progresses that might be a very useful data point.

CHAIR ROYBAL: Thank you, sir.

JONI ARENDS: Good afternoon, members of the Board and staffers. My name is Joni Arends and I'm with Concerned Citizens for Nuclear Safety. I've been following this project since 2002, since the Environmental Impact Statement came out. I've worked with Kyle, with Rick, with Stephanie, with Nancy over the many years. I haven't made a presentation here for quite a while but I'm here today.

Concerned Citizens for Nuclear Safety has been involved in the discharge permits that allow for the extraction and injection wells. We've been involved in the permit to apply the treated water in the narrow canyon. In Mortandad Canyon and in the floodplain so I'm very familiar with this project. I have concerns about the perchlorate plume and I brought copies of a 2013 report that shows the co-located percholorate and chromium plumes in the bottom of the canyon. And then I brought two figures. One is this one from 2013 that shows the chromium plume along with the co-located perchlorate plume. We're specifically concerned about the percholorate plume because it is a chlorine-based chemical that travels with water, with the groundwater. Perchlorate is dangerous if you're exposed in the first trimester, if the fetus is exposed it causes problems with thyroid and other things like that. It doesn't necessarily get filtered out through the water treatment process. So we're concerned about this because this area isn't too far from the Buckman wells and the Buckman diversion project.

The other figure is from the presentation that Mr. Hintze referred to earlier before that radioactive and hazardous materials committee meeting at the State capitol a few weeks ago and you can see in this figure the movement of the plume to the northeast at the chrome injection well 6 in this area here. This figure is different than this figure.

MR. HINTZE: You have that as part of the fact sheets that I handed out as a graph.

MS. ARENDS: Right. But the perchlorate plume is missing from the figure. So we're bringing this to your attention so that you're aware of concerns that the perchlorate in this figure was at 2 parts per billion and I've done some research with the New Mexico Environment Department to understand what standard was being used because sometimes it's 24.5 parts per billion and sometimes it's 12. So I'm trying to get clarification from the Environment Department of what standard is being used in the Consent Order. So I bring this to gain attention.

I don't want to take up too much time right now but I would like to ask Mr. Hintze when he comes to the Buckman Board again if you could bring copies of the presentation for the public as well, it would be very helpful so that we could follow along while the discussion is going on.

I also wanted to let folks know that the Environmental Protection Agency has designated this entire aquifer, this regional aquifer that we're talking about, a sole source drinking water aquifer which means that 50 percent of the people rely on the drinking water and there is no substitute for the drinking water. That area for the Española basin sole source drinking aquifer runs from Tres Piedres to the north almost to Galisteo and it's between the Sangres to the east and the Jemez to the west. So it's a very large area and CCNS supports Commissioner Hansen's concerns about dealing with plume before it spreads any further because of the harm that could also be experienced by those downstream and upstream of the plume. I don't know if you're aware but Los Alamos

County residents rely 100 percent on this aquifer for their drinking water. It's a different situation than Santa Fe where we have multiple opportunities to supplement our water.

So I just wanted to offer this information to you so that hopefully staff can keep a better eye on this. Part of the discharge permits, one of the provisions that we got in the discharge permit was for the laboratory to provide quarterly reports to the Environment Department that talks about what the sampling results are every quarter. And if you look at this most recent version dated November 22nd you can see that the perchlorate and the chromium levels in the wells that are closest to the boundary with San I is R-50, the levels are 200 – 237 which is 4 times the 50 parts per billion. So I don't know if there's specific staff, I haven't met with Mr. Vokes before but if there's specific staff who are watching these numbers and if there's a trend analysis being done I haven't been able to do that since I've been back but I plan to do that and would like to provide you with some further analysis of what CCNS's perspective on what is happening with the plume. So I wanted to thank you for your time this afternoon.

MR. HELM: You mentioned and another speaker mentioned about contaminating the Buckman wells; are you referring to the wells themselves or just to the intake manifolds or whatever in the river? Does the possibility of chromium and – perchlorate go underneath the river to the well side or is that just a mistake?

MS. ARENDS: There's a whole series of articles specifically *Vadose Zone Journal* from 2005 that included many articles from the laboratory that talk about the drawdown of the Buckman well field drawing the contaminants over across the river, through the river system because if you're up here at the plateau and you go down here 1,000 feet you're basically at the top of the Buckman wells so the drawdown of the wells could cause – could bring those fast moving contaminants like perchlorate across the rivers into the wells. It's also important to know that the Santa Fe's drinking water report that is required under the Safe Drinking Water Act of 2005, 2006, 2007 timeframe reported plutonium and – plutonium in the Buckman wells number one and eight which are the wells closest to the Rio Grande on the east side of the river.

MR. HELMS: Okay, I understand. You did mean the Buckman wells, thank you.

MS. ARENDS: So we're concerned about that as well. We're concerned about the Los Alamos County drinking water wells as well because they were drilled really on in the 1940s and they were drilled with slots, they have slots, they were wielded, were the water comes in, filtered in, there are slots in these big wells. So there's concern about – there's all sorts of different other concerns about that. But I would be happy to talk with you off-line about that.

CHAIR ROYBAL: Thank you, Ms. Arends.

MS. ARENDS: Thank you.

CHAIR ROYBAL: I think that was all of the individuals that wanted to speak. I appreciate your time, sir, and I just want to say thank you for your presentation and also just reiterate that of course we want it to be cleaned up correctly. So I think the time that is necessary to mitigate the hazard correctly is what we really need to think about and I know that is what you were indicating that we want to do it right. So I appreciate that, thank you.

9. Status Update on Water Reuse Strategy, Planning and Implementation
[*Exhibits 2 and 3: Santa Fe Water Reuse Information*]

MR. HARWOOD: Thank you members. Just as a quick point of reference, I was asked to go ahead and introduce this item to the Board briefly. So the City and the County I believe staff have been looking at a treat effluent management project. Bill will present this in some detail and to the extent that the alternatives that are being studied in this effort might implicate BDD infrastructure or BDD permitting, I've been working with City staff with facilitating the exchange of information about those permits, the permits that the Board holds for the project.

Some of you have been hearing about this effort in other venues. The City staff has been giving presentations to other entities and it seemed appropriate to have the presentation made to the BDD Board because a future selected alternative may have implications for the BDD project and Board activity. So with that I'll hand it over to Bill.

BILL SCHNEIDER (Water Resource Coordinator): Thank you, Kyle. Mr. Chair, members of the Board, I have put together two packets that help summarize and hopefully provide a brief summary of where we are in the status of this study. I have the power point presentation that I would walk through as well as the executive summary from our Title XVI feasibility study for your library. I also developed slides for the public, visual aids, if there is interest I could activate and turn them on. If that brings value to the meeting, so I defer to you, Mr. Chair.

CHAIR ROYBAL: I think we're okay. Is everyone okay? Let's just go ahead.

MR. SCHNEIDER: So basically I am here before you as Kyle summarized really where we are and the status of this project. We are in a planning phase. We completed a feasibility study. I wanted just to highlight a couple of key points that I guess are basically the primary objective of me coming before the BDD Board. This is obviously a very large encompassing study that I am distilling to 10 minutes. But basically this study was partly funded by the US Bureau of Reclamation so I want to commend them for their support. The reuse that would potentially involve the BDD is focused only on the City and potentially the County's portion of the San Juan-Chama water that comes through the BDD. So I want to provide that clarification right out of the gate.

In addition, there will be continued releases of water from the Paseo Real Wastewater Plant to the Santa Fe River. I believe there has been some misconceptions that this would be terminated and all of the water would be diverted and that is simply not the case.

At this stage the City and its partner have not had any selection of an alternative. What the feasibility study essentially accomplished is a ranking of projects of alternatives and certainly there's potentially more than one that may be viable. But one did rise to the top in terms of engineering ranking and I'm going to touch on that for your consideration. What's key to mention here is that there is still a lot of work to do. There's legal issues. There's regulatory, there's engineering, there's stakeholder factors that need to be addressed. So we're still at the planning stage.

With that stated I have a figure which illustrates the regional footprint of Santa Fe's water system and its current configuration. We have four primary sources of supply which I think everyone at this table is aware of so I won't go into detail but the real focus is the water that is currently being discharged at the wastewater plant. The emphasis of the study was how the City and the County could potentially utilize that water to the greatest benefit. We conducted a triple bottom line analysis and it's a rigorous engineering study and what that does is it looks at the feasibility of various alternatives on reuse but it weighs things more than just the sheer economics of the amount of water that could be retrieved and reutilized for potable purposes. It also looks at the environmental benefit and detraction as well as potentially societal benefits. So, if we transition to slide 3, which is the water demand figure here. A couple of key takeaways is obviously this illustrates that our demand has been decreasing since 1999 and obviously we applaud the conservation efforts but also our use of sustainable surface water has been increasing. The past few years we have essentially been able to have reliance on mostly 90 percent surface water through Canyon Road and the Buckman Direct Diversion San Juan-Chama water and that has allowed us to rest our wells or have a reserve for groundwater for drought purposes.

So as I emphasize, I just want to bring to the attention of the Board is really what we're focusing on in the study is San Juan-Chama portion of the water, okay. So I'm just going to keep on reiterating that if you permit. But the next slide I think is key just to bring to your attention that this has been an effort that's been ongoing for 30 years between the City and County. This is not a new idea. This even goes back to the Metropolitan Water Board in the '80s. So where we're at at this stage is really that now we have the BDD that sort of I guess rises the potential of leveraging an asset that the City and County invested in to maybe developing a new source of supply which is reuse water.

The next slide is basically revisiting something that we presented in the past which was the findings of the City, County and Bureau of Reclamation study on climate change impacts to our water supply. And in its most abbreviated sort of conclusion there was concerns that basically due to the effects of climate on the supply that we could see a pretty significant reduction. And in the most extreme case up to 9,000 acre-feet which is essentially now our current demand. So how to overcome that was really what drove us toward looking at what Reclamation deems adaptation strategies. This next slide essentially is a series of potential ways in which the City and County could address shortages under drought. And so these strategies, right now the City and I can't speak for the County but I am fairly aware in my conversations with John, Claudia and Gerald is the fact that we're all exploring every one of these. The ultimate finding here is that there's no silver bullet. Every one of these will probably have to be explored in some fashion in order to address shortfalls in the future. But I'm here before you to give you an update on reuse.

The next slide is essentially after our eye opening conclusions on the basin study is that we applied for a grant and Bureau of Reclamation funded us $132,000 and we worked with Reclamation and the County was a partner in the sense that they provided a letter of support and we initiated this study. As the next slide shows is what we did is did a national survey of all potential reuse strategies and we landed on seven that would potentially be viable for the City and the County and it looked at expanding the reuse

which is currently what we're doing now with the purple pipe program where we distribute water and it's primarily for irrigating turf. Is that the most beneficial use; and I'll leave that as a rhetorical question for now. Or secondly is to basically divert a portion of the water, the San Juan-Chama water, over to the Rio Grande. Essentially it would be a pipeline. It is not glamorous but it would divert that water down essentially Buckman Road right down stream of the diversion and the concept is that then we would be able to take that water back and create a recycling exchange so that we could reuse that water.

Then there are a series of permutations of indirect and direct uses where we could do enhanced living river, where we would pipe water upstream all the way in one case up to 2-mile pond, and then trickle it down the river and then try to recapture it as aquifer storage and recovery. And there's certainly benefits to that from a societal and environmental but there are also detractions. For example, three lift stations and the amount of energy it would take to move that water up hill, is one example. So we looked at all of these various types so in an abbreviated sense, the next figure sort of provides a map of the distribution of this network of various ways of which we can reuse this water which we evaluated. The following slide really just gives an example of how we did the screening under this triple bottom line analysis and Reclamation was very supportive and actually complimentary of this type of rigor. This went beyond even the detailed requirements of our contract under the grant and under the BOR engineering manual. We went beyond the call of duty in trying to take other factors into consideration. So what we looked at was cost effectiveness, public and environmental benefit, public acceptance and project risk mitigation which kind of falls into the legal and regulatory components of any engineering analysis. So basically the following slide is going right to the back of the book in terms of conclusions and findings was that after going through this analysis the study indicated that the highest rate, not the only viable, but the highest rated based on this analysis was to divert the water to the Rio Grande and to bring it back through the BDD. The BDD in its current construct has the capacity to accept that water and treat it. But certainly in doing so, we raise a lot of questions. We may be coming before the Board with respect to how would it look in terms of cost implications and sharing between the partners. As Kyle is here to share with any details with respect to the regulatory component, it would require opening the permit which certainly has its challenges because right now we're limited to 8,730 acre-feet per year and doing this recycling which I'll share with you in a second, it will go beyond that. There's other challenges that I would be happy to speak to but we recognize that there's still a lot of questions to answer. We're not at a decision stage. We're simply pursuing opportunities to explore this further. We've been at this 30 years and we need progress.

So with that stated the next slide is a cartoon that basically brings us to what this concept would be. In its current form under the BDD we, essentially the City has 5,230 acre-feet per year available under contract with the federal government for San Juan-Chama water and the County has 375. We bring that water up through the BDD, treat it, put it into the distribution system. Based on our analyses the City of Santa Fe's treatment system receives 60 percent of that water back. So we consume 40 that is lost to various sources and then basically we get 60 back. As an example, Albuquerque has 50-50, so we're doing a little better job. We have a different climate, different behaviors, etc. So the takeaway is that 60 percent of 5,230 or 375 is a significant amount of water. And in this case has this figure shows, for the City it would be 3,180 in concept and for the

County it could potentially be up to 225. So if you go to the next slide, if we were able to do this exchange and I always think the bottom line is what's the value – what is the economic value? The going rate is variable but at $20,000 per acre-foot the benefit to the City is potentially up to $63 million. If we were to go out on the open market and not – if we don't utilize this water our only other choices is, one primarily in our current planning is to go out and buy up water rights and basically decommission ag which certainly has a societal and cultural impact as well. So really the takeaway that we have in the case of the County is, you know, that 225 acre-feet is worth about $7.5 million. So what we looked at is that we need to explore if it is feasible how do we overcome these technical hurdles, these regulatory hurdles, legal hurdles. So we're right now conducting a study with an engineering firm but also with several legal entities to try and understand how we best could make this system work. We plan on meeting with the County, with the BDD Board and certainly technical staff to try and come up with a plan that we may bring before you or may not. We're just not there yet.

So with that stated I stand for questions, Mr. Chair.

CHAIR ROYBAL: Questions for the Board. We'll start with Member Fort.

MEMBER FORT: I have many questions about describing this as recycling of water. In fact, in terms of molecules put in from the wastewater treatment plan and molecules taken out, it will be different water; will it not?

MR. SCHNEIDER: Could you rephrase the question, please.

MEMBER FORT: Well you're calling it recycling of water saying we're going to take the water and we're pipe it up to the treatment plant, dump it in the Rio Grande and then take out new water; is that not correct?

MR. SCHNEIDER: So for clarification I would say an exchange.

MEMBER FORT: To call it recycling, it is not in fact recycling the same water; is it?

MR. SCHNEIDER: No.

MEMBER FORT: No, no.

MR. SCHNEIDER: It isn't exactly.

MEMBER FORT: So I guess I really questioned when you say the City hasn't made a commitment to this, did you not make an application to the Bureau of Reclamation for some $5 million in a grant? But you made the application; did you not?

MR. SCHNEIDER: That is correct. Yes.

MEMBER FORT: And what was the application for?

MR. SCHNEIDER: So the application is to do exactly as I just basically said in this previous slide is to further explore the viability of this particular project that was rated highest, the pipeline to the Rio Grande.

MEMBER FORT: Correct. So that sounds like a commitment to that particular project; does it not?

MR. SCHNEIDER: I guess I would disagree with that assertion. I would say it is further exploration to determine if there should be a commitment.

MEMBER FORT: Has the City considered whether it should do an environmental impact statement that would look at the effect of all of these, the environment effects of each of these different alternatives or are you processing as you just described with looking at impediments to this particular project.

MR. SCHNEIDER: Well, as part of the Title XVI process there is a project that ranks highest and therefore is explored under the federal guidelines for funding. However, maybe rephrase it – as I mentioned with these adaptation strategies there are other alternatives, ASR being several, conservation certainly being one that the City is also exploring in parallel.

MEMBER FORT: But not funded?

MR. SCHNEIDER: That is correct. So under Title XVI one project essentially is explored for funding. It's not a panacea of alternatives. The feasibility study is designed for that very purpose to rank projects.

MEMBER FORT: So the feasibility study in which you had one public meeting as I understand it, the engineering firm had one public meeting, and they selected this alternative and that's the basis with the City going forward with an application to further study the single alternative.

MR. SCHNEIDER: Again, as I mentioned, we've been studying for 30 years and we're trying to basically advance the analysis to the point of being able to make a determination.

MEMBER FORT: But you have selected in advancing the alternative – the analysis, you have selected one alternative to further analyze and there are number of other alternatives that the public, I'm obviously one of the people who would be interested in being part of that, would consider. I'm interested in actual water recycling and direct reuse, just as an example, and the City ranked that, you know, the staff within the City didn't think that was going to be politically acceptable. I've got lots of national experience that tells me otherwise with respect to that.

MR. SCHNEIDER: With respect to direct potable?

MEMBER FORT: Indeed, indeed, yes, national and international.

MR. SCHNEIDER: But what's interested about that very alternative, when we met with the County staff I thought they brought a very insightful element to the analysis which is system resilience because the fact is, if you're bringing in less than drinking water quality water into the system and you have a hiccup, now you've essentially taken out two sources of supply, the BDD. So there was a risk factor.

In terms of public perception, certainly it is being done in Big Springs, Texas, nowhere in New Mexico at this point. So there are certainly unknowns with respect to the regulatory process. We don't have water guidelines to follow yet. They are under development but it is still exploratory.

MEMBER FORT: Yes, I am very well aware of the regulatory system for it. Did the County endorse your application to the Bureau of Reclamation?

MR. SCHNEIDER: No, they did not.

MEMBER FORT: No, and what was the Bureau of Reclamation's decision with respect to the application?

MR. SCHNEIDER: The decision was that it was not funded for FY17/18 and we were encouraged to apply for next fiscal year. So that's the current status.

MEMBER FORT: And I think that there are those within the environmental community who did not want to see it funded by Reclamation because we want to see a further exploration of the other alternatives including some that are more viable.

I think, Mr. Chair, John Buchser from the Sierra Club will talk some about other alternatives that others within the community want to see given further discussion. I am not

sure if Andy Otto is going to talk about that as well. So I think I will put off most of my questions at this time.

CHAIR ROYBAL: Okay, thank you. Did we have any other questions? I think we had Councilor – Commissioner?

COMMISSIONER HAMILTON: This information is probably available in the report itself, but in the – I just haven't looked it up – but, in the presentation you talked about the level of conservation that we've gotten to, that the City has gotten to which is very cool; is that the level that was used in estimating future water needs/the level of demand?

MR. SCHNEIDER: So the basin – that was done under a different study and actually we're taking that further now in terms of our long-range water supply planning. We are revisiting the basin study with some work being done with Jesse Roach and some other scientists. But to specifically answer your question, no, we determined that the threshold by which we could bring the GPCD down to lowest point would be 70 and it's roughly now 87. So we believe that there is still a potential for further conservation and that's really our goal here.

As I mentioned with this shortage between the City and County of 9,000 acre-feet it's going to require reuse and several other engineering considerations.

CHAIR ROYBAL: Commissioner Hamilton, does that answer your question?

COMMISSIONER HAMILTON: At this time, thank you.

CHAIR ROYBAL: Commissioner Hansen.

COMMISSIONER HANSEN: So you mentioned the purple pipe; what's going to happen then if we're taking the water to the Rio Grande, how are we going to replace that water in the purple pipe? And are we going to use potable water to water our parks then or are you saying that we don't need t use purple pipes?

MR. SCNHEIDER: Thank you for the question. No, I'm not saying that. Basically one of the assumptions in the feasibility study was that all contracts for the reuse water in the current configuration would be honored. However, one of the great values that we're seeing in this analysis that we're working on is potential conservation savings under the purple pipe program under its current configuration and particularly at the MRC and the Marty Sanchez Golf Course where the quantities of water being utilized far exceed the national averages and Mr. Engelhoff has been providing some technical support with us and it's my understand that the City Parks Division is actually going to explore a water audit to help us reduce our demand on that system. So one of those options is that any savings essentially could be water that could be released in the Santa Fe River during times of need, June and July, when the river is most stressed due to low flow conditions.

So we're exploring all of these permutations.

COMMISSIONER HANSEN: That leads me to the next possibility, one of the options is to pipe the water up to Siler and then have it go down from then which would maybe create one lift station, I don't know – I'm not an engineer. But that is something that was promised to the Village of Agua Fria that they would get water back in the river because of when they closed up the dam and the reservoirs. So if it is a way to bring back agriculture to the Agua Fria Village which I represent so therefore I'm really interested in that. So I think that is a viable alternative because I think why could we not get return flow credit to the Santa Fe River as a possibility. So those are things that I am concerned about and then also with the City I was on the Parks and Recreation

Advisory Board so I am quite familiar with the parks and I 100 percent support an audit of the water that is being used in the City for the parks but Swan is not built out and Swan is on the purple line and so Swan is only in the first phase and it has at least three more phases, my memory on that is not perfect, but so there are other issues of water and other ways to use that water to recharge our own aquifer without sending it back and therefore recharging our wells and recharging the Santa Fe River and –

MR. SCHNEIDER: I fully concur and again I think part of the frustration I'm sensing is the process by which we're working under the Bureau of Reclamation guidelines under this Title XVI project. There is certainly fiscal implications and I'd be happy to explore all of these other alternatives to further rigor. I just simply at this stage don't have the current funding to take that level of analysis.

But I do want to share that the City is exploring in particular ASR. We have a draft white paper that we're going to make public once we finalize and we've been doing some, I would say, fairly detailed hydrologic studies along the Santa Fe River to one, not only to identify where our greatest rates of seepages are that would allow us to locate optimally where the ideal ASR project would be located. But also looking at water quality, competition for water because you can't site an ASR project where there is already a lot of groundwater pumping that you can't control people taking the water back out for example. Agua Fria, we have challenges, not that they can't be overcome but there used to be a wastewater plant there as you're aware, so we potentially have a nitrate problem. We have perch water system there that is going to impede the rate of infiltration. So there are challenges.

COMMISSIONER HANSEN: That's why I've been working on the sewer for Agua Fria because it's important.

MR. SCHNEIDER: Agreed.

COMMISSIONER HANSEN: Okay, I'll leave it there because maybe some of the other people will bring up some of the other issues. But just one other, also the people downstream from the wastewater plant, La Cieneguilla, they are extremely concerned and I know you say that there's not going to be a reduction in that water but they are also constituents of the County and they are concerned about their agricultural rights and the water that they have been receiving.

MR. SCHNEIDER: Acknowledged.

CHAIR ROYBAL: Thank you, Commissioner Hansen. I'm going to go to Commissioner Hamilton and then to Member Fort.

COMMISSIONER HAMILTON: I actually did have another question and I wondered if you could just say a little bit about the – it's a good analysis, I think it's an interesting graph, the top graph that shows the possibilities for – is the County part of that, not withstanding that it's just – if you take a 60 percent estimate and how much the County uses but the County doesn't actually, if I'm not mistaken, have any ownership in the water from the treatment plant; right?

MR. SCHNEIDER: That is correct. There's a couple of details. I greatly appreciate the question. There's two elements to that. You're correct in terms of the arrangements the City essentially quote-unquote has the ability to utilize that water to its beneficial use. However, in our very preliminary conversations to bring benefit to the County that we're trying to capture is recognize that we are partners on the BDD, one thing that we're potentially seeing is something of a construct like this where we give that water

back as an exchange to essentially arrange to utilize the BDD if this alternative is determined to be preferred for the City and thus the County.

COMMISSIONER HAMILTON: Thanks. I might just mention because you mentioned talking to the County about it so I think that this is certainly one of those things that would be really good to have some discussion with the County about so they're in the loop on those discussions.

MR. SCHNEIDER: And I guess I should have done a better job. In terms of where we are is we just initiated, late September 30th, a contract with an engineering firm to facilitate this implementation plan and they have a scope of work to work with us to develop a plan to meet and discuss options with all of the stakeholders.

COMMISSIONER HAMILTON: Thank you.

CHAIR ROYBAL: Thank you, Commissioner Hamilton. Member Fort.

MEMBER FORT: Could you clarify for me, the $132,000 grant, the Title XVI Reclamation grant, are you still working under that, when you say you're constrained by the Reclamation Grant.

MR. SCHNEIDER: Well, the constraints are the guidelines of the grant itself. There's essentially, if anyone has read the report, that format follows a national standard under the Bureau of Reclamation's engineering guidelines. So to specifically answer your question, we closed that grant out today.

MEMBER FORT: Okay. So for further work if you were to – if political officials of the City were to direct a further reaching study, more comparable to an Environmental Impact Statement, would there be any reason aside from whatever staffing issues you have, but since the grant is closed out is there any reason that a more comprehensive look at each alternative cannot be undertaken at this time?

MR. SCHNEIDER: No.

MEMBER FORT: Thank you. And what law firm have you retained and at what cost?

MR. SCHNEIDER: For this study?

MEMBER FORT: Uh huh.

MR. SCHNEIDER: Most of our legal advice has been coming internally from Marcos Martinez.

MEMBER FORT: Okay, I thought you said you retained a law firm.

MR. SCHNEIDER: No, I don't recall saying that. We have an engineering firm under contract, that is correct.

MEMBER FORT: Okay, thank you.

CHAIR ROYBAL: Thank you, Member Fort. I'll go to Councilor Harris.

COUNCILOR HARRIS: Thank you, Chair. A couple of quick questions. Bill, do you know when BDD in its current form was scoped, did it anticipate anything like this?

MR. SCHNEIDER: That predates me so let me defer that question to Kyle, please.

MR. HARWOOD: No. Simple question, simple answer. Maybe I'll add another layer of detail to that. The final Environmental Impact Statement for the project, as Bill mentioned, is for 8,730 acre-feet a year. And there are specific buckets of different kinds of water rights that were analyzed in the Environmental Impact Statement and while the engineering for the project which I was – Nancy and I both were more peripherally

involved with supporting the engineering team at the time, which the engineering capacity they overdesigned in some sense of the BDD to be able to peak very rapidly to be able to meet the future unknown demands of the City and County. It's part of that peaking that is why this top-ranked alternative doesn't require much or any as I understand new engineering other than the treated effluent down to the Rio Grande the main impediments to the Rio Grande project as it currently stands now would be the water right permitting with the State Engineer's Office, and the new environmental impact compliance whether it's an EIS at that time or an EA or whatever else. That's my somewhat rough understanding of where the analysis stands.

COUNCILOR HARRIS: And that's what I thought I heard Bill say as well. That the technical capacity or capability as far as we know is there but that, as you say, water rights and Environmental Impact Statement and so there's some certainly legal and regulatory issues that need to be – and financial issues. So that's going to lead into my next question.

MR. HARWOOD: Can I just add one more layer. Just to remind the Board, the City and the County as governmental entities own their water rights that are diverted through the BDD but it's actually the Board that holds the environmental permitting. So when you think about the critical paths for the different topics it would be a new State Engineer application of some nature in the City and County's name. But I suspect each of the governments will handle in coordination with Nancy and I but it is the environmental permitting that will come back directly to the Board.

COUNCILOR HARRIS: So really does that mean – it seems to me that the City and the County would have to cooperate in doing this, to pursue this particularly alternative. As you say, each entity owns the water rights but the permitting is through the Board and obviously that is a City-County Board.

MR. HARWOOD: I think now we're getting down a branch of the tree where I'm not totally sure of every assumption you've made, but certainly one of the concepts here, especially if it doesn't involve City and County San Juan-Chama return flow credit which Bill used recycling as another interchangeable word with return flow credits. But return flow credit is the technical State Engineer permitting process, but if that's the branch of the tree that we're down, then, yes, it would be City-County coordination of the OSE permit, City-County coordination here on this Board for the environmental permitting and then all the other issues.

COUNCILOR HARRIS: All right. And, actually I like exchange I thought that was an easier concept to understand. So I'm looking at this sheet, so Alternative 2 is really what you've described. That's the highest ranked solution if that's the right way – that came out of the feasibility study.

MR. SCHNEIDER: Right, correct.

COUNCILOR HARRIS: And so the best alternative in terms of capital cost is approximately $18 million in 2016 dollars; correct?

MR. SCHNEIDER: Yes, that is correct.

COUNCILOR HARRIS: Okay, all right. I just wanted to make sure I understood.

MR. SCHNEIDER: And the reason for that is all the other alternative, essentially this Alternative 2, as we're calling it, is so simple in its nature, it's a pipe and a pump and then leveraging the asset of the BDD to a greater use. All of these other

alternatives require additional water treatment to a higher standard quality of water to distribute that water and that adds capital cost.

COUNCILOR HARRIS: All right, okay. I just wanted to make sure I understood. And then you've got, obviously, O & M costs and basically what you say is reduction of future water shortages. So this number is against the approximate 9,000 that you identify; correct?

MR. SCHNEIDER: Could you –

COUNCILOR HARRIS: The 9,000 that --

MR. SCHNEIDER: It goes towards closing that shortage, the gap, correct.

COUNCILOR HARRIS: Right, that's what I said. The 2,300 is against the projected approximate 9,000 acre-feet annual. Okay, I just wanted to make sure I understood it.

And so, I just want to make sure, I know there has been questions about how other alternative might be considered in much more detail, but really this is where, kind of, where the focus is right now, Alternative 2 with Carollo, and they're doing – you called it planning but really what's their scope under their current contract and then the timing of that as well.

MR. SCHNEIDER: So in an ideal world the contract will be for nine months. It's a 12 month contract. We are expediting it to be nine months. The objectives under the statement of work is to evaluate the regulatory pathway we would follow, which would obviously then involve and invoke the BDD Board because there is no way that we could conduct this project without the participation of the BDD. So what we would do is develop a strategy to demonstrate where the benefit is to both the City and the County and all the stakeholders in the Santa Fe River. You'd be developing a project like this versus the alternatives, simply put.

COUNCILOR HARRIS: All right. Thank you, Chair.

CHAIR ROYBAL: Thank you, Councilor Harris. Yes, Commissioner Hansen.

COMMISSIONER HANSEN: I know this is another idea about the living river but is it possible that we could have two pipelines? One –

MR. SCHNEIDER: If money is no object. [laughter]

COMMISSIONER HANSEN: If you're thinking about this, you know, one up the river to maintain the living river, maybe to Siler, and then one for return flow credit.

MR. SCHNEIDER: Can I offer you maybe an alternative way to perceive it in terms of sustaining the living river without that second pipeline and that would be in a very simplistic sense, if we create a new source of supply this exchange water, doesn't that essentially allow – give more resiliency for the City's ability to maintain the living river. As you're aware under the ordinance and under the rules – so I won't go into detail but certainly there's times where that may not actually be able to beat that water, may not be able to --

COMMISSIONER HANSEN: Exactly.

MR. SCHNEIDER: So right there is certainly a benefit to the living river.

CHAIR ROYBAL: Thank you, Commissioner Hansen. Member Engelhoff.

MEMBER ENGELHOFF: Yes, Alternative 7, direct potable reuse requires one pump station and 6.1 mile pipeline; have you talked to anybody at the Club, at

the Coop, because there is a pump station and there is a pipe already there that goes right by Chuck's doorway there.

MR. SCHNEIDER: Yes, we have. We met with Charlie Nylander and several members of the Club's board to discuss the viability of utilizing that line. And then I have recently met with Bryan Romero and tried to pull some of the engineering records. Certainly, there would be huge benefit to both parties, certainly if we could utilize that line. There may be rating limits in terms of the pressure thresholds. I believe it is a 12 inch line if I recall.

MEMBER ENGELHOFF: It might be 30 but we drew a million gallons a day off of that line when –

MR. SCHNEIDER: We're talking up to five.

MEMBER ENGELHOFF: But it kind of goes along the same line. If you had two pipe systems, you already have one in place. And another question I had, exactly how much water that is released from the wastewater treatment plant right now actually has a use and how much of it is just released in the river? Because I know from the Club's standpoint six or seven years ago we went to the City because we wanted be – before we built our pipeline – we wanted to be 100 effluent and we were told – as that time we were taking about 400 acre-feet of treated effluent water and we wanted to take, we asked for 150 more to get up to 550 and we were told there wasn't going to be any effluent left.

MR. SCHNEIDER: And that is the case, Tom. It's a great challenge and one of Commissioners noted of downstream obligations and trying to maintain water in the river. And so there was a goal set forth in the 2013 Reclaimed Water Plan that established a threshold of 2 million gallons a day to be kept in the river for downstream users. So, therefore, hence, it limits the amount of available water primarily during the high demand irrigation season. That's really why that particular alternative almost falls out because it only brings value/benefit for times of irrigation. In the winter months it serves no purpose. And I know the County in doing their evaluations on the Quill Plant also will have to explore that very issue of how to put that water to beneficial use year round versus just during the summer months. And so I've had some very minor conversations with John Dupuis on that topic, because there are certainly synergies on all of these projects, I believe.

MR. HARWOOD: Could you just speak to the timing questions. That is one thing that I don't know that's very intuitive. A lot of these studies are looking at the use of treated effluent during the non-irrigation months as – because this is really looking at the acre-feet, the volume, but in only parts of the year; do you want to just touch on that?

MR. SCHNEIDER: Yes, thank you, Kyle. So basically, one of the values that we felt of several of these alternatives both ASR and the pipeline exchange project is the fact that you could pull more water off when the demands are lowest in the winter. So in the summer when the river is stressed by natural base flows that are low and/or irrigation demands that basically – you're not stressing the system further. So that's certainly got weighed in during the analysis.

CHAIR ROYBAL: Okay, any other questions from the Board? Okay, do we have members from the public who would like to ask questions or make comments?

ANDY OTTO: My name is Andy Otto and I'm a resident of 1209 Calle Unidad and I am also director of the Santa Fe Watershed Association. And the biggest thing that we have proponing on this and we'd like to say it again, we need some public workshop here. We need some public input. I can understand that there's been the engineering firm

involved and the strict rigors of that and so that's over now. So now we get to have public input so we know exactly what the people downstream especially are thinking about this and their cultural heritage. So that's what we'd like to make sure is inserted so these meetings become more open and people are taking notes. Thank you.

CHAIR ROYBAL: Thank you, Mr. Otto.

MR. SCHNEIDER: Mr. Chair, I should have elaborated, I did a poor job. But part of the scope of work under Carollo's contract and implementation we have two public workshops planned.

CHAIR ROYBAL: Could we have our next speaker.

WILLIAM MEE: William Mee, Agua Fria Village, 2073 Camino Samuel Montoya. Water is always a big topic with our village. We've been in a controversy with the City of Santa Fe probably since 1880 when they built the 25 acre-foot stone dam and that blew-out shortly after. But I mean over the years there has been a lot of controversy. Over 50 residents of our community filed the Henry Anaya versus City of Santa Fe or PNM and City of Santa Fe lawsuit which eventually became the adjudication back in 1971 and that was after the effluent water was cut off to the village because of the EPA Act that said you have to 99.9 percent pure to send that water down the river and they were nowhere near that standard so, you know, they really had no other choice but to cut it off.

I think that we're facing kind of a partnership here with the City and the County and that's a really good thing and the ideas that the City has under the study sound pretty good to us. Our particular one was maybe take it up to Siler and then in the future maybe go all the way up to the two mile pond, who knows, but the climate change study – I mean it's a real eye opener. There's just a lot of work that needs to be done and Agua Fria wants to be a partner at that table. Thank you for having these meetings.

CHAIR ROYBAL: Thank you, Mr. Mee. Can we have our next speaker.

JOHN BUCHSER: Thank you, Mr. Chair. Thank you, Board members. John Buchser, 606 Alto, Santa Fe. I guess my concerns kind of boil down to two different ones: one is collaboration with the County and up to this point there has actually been a gap of about a year and the other is water security. To the City and the County's credit there's been a lot of work on thinking about how do we meet our future needs and not just for five or 10 years but decades into the future. So, thinking about how to meet those needs I think is really important and I'm glad that you're looking at thinking about how to do that. Buying water from elsewhere in the state and moving it here is fraught with lots of legal complications and as you mentioned it is very, very costly to do and tends to get tied up in the courts for decades at best. So looking at alternatives to keep our water here is really valuable. Our water security for the community is really valuable.

I was really pleased to see that there was a threshold in the Carollo report. I didn't know how far back dated and why but I saw that the City left a pretty fair amount of water going down the river from the treatment plant, so that's good. That helps provide some minimal amount of water downstream of that point and it helps provide aquifer recharge particularly during non-irrigation seasons. So that's good.

But if you pursue the current preferred alternative in the study, you're taking a lot of water out of the system and you're taking a lot of recharge out of aquifer and you're decreasing our water security quite a lot. And then the other aspect of that is the reliability of that source. I just looked up – Wolfe Creek Pass usually brings, you know, brings great joy to my eyes because I can look at that snow tell site and see that they have 8 or 10 feet of

snow by this time of the year already and right now they have like 16 inches. So, that's not – usually the San Juan Mountains are a wonderful source of water on the average they will probably continue to do so but there's going to be periods of time when that is not a very reliable source and the more dependent we get on that – it's just harder. Right now if we don't have that source we can get by. We've got a nice complement of options but if we don't have that in a given year or two or three, and if we have got to 2055 and we are using that particular scenario we are going to be in really tight straights. And I know that there are arguments, I'm chair of the Santa Fe River Commission in addition to my responsibilities as a volunteer for the Sierra Club, I know that the first responsibility of the City is to its customers. We've got to provide water to the City. The County is in a similar position. You know, you've got to provide water for your customers and we have to provide water for some of the acequias in Santa Fe and unfortunately a lot of them went bye-bye when PNM owned the system, so they're kind of up there – actually, I think they're first although the acequias are willing to say that if we're really in a crunch, we're not growing our crops for consumption so we can let it go and the river falls last. And the river used to be first. It was here long before any of us arrived here and it's wonderful that the City has made a commitment to letting some water down the river but if things get tight that's going to be the first thing to go in terms of less water and to me having more options that are contained within our aquifer area are particularly important. So to me sending water out which may be a part of – I appreciated Anna Hansen's question about can we do several things because in times of plenty that may well be a valuable option. But the permitting on aquifer storage and recovery, the regulations as imposed by the Office of the State Engineer they were initially pretty strict when that law first came out. And now there's a lot of flexibility that's coming out of the Office of the State Engineer, the Bear Canyon Arroyo Project and the direct injection project in Albuquerque are pretty large projects and they seem to be going fairly well. There are projects around the country and certainly engineering experts exist to not have to actually treat water to drinking water standards depending on where it is injected. And the benefit is that you keep the water here and if we need it presumably we can get to it. And that's to me the cost of doing more engineering studies on that aspect of it, you know, we're at the timeframe that we have time to think, we have time to study. We are not constrained and I know it's difficult. The County doesn't sit on it, as far as I know, lots of water rights. And the City has the bigger puddle of water, so as to speak. The projected use to 2055 is roughly equal so you're sort of trying to plan for the County and the City to both grow. There's going to be a lot more growth – it's like 4 percent plus for the County and 1 percent for the City so the City's growth is slow and it's good to see that you're trying to think about that but I think to collaboratively work on that – here's an example of that and it's hard to pass up on a large carrot, here's $5 million, go for it, but let's think about the impacts. I want to have water when I turn on the tap. I've got really good water here and I appreciate that. We do have risks. One of the big ones I think is BDD in terms of, you know, we've got that surface variability and then we've got the Buckman well field and we've got concerns about potential contamination.

So in any water system it's – you know, the more I know, the more I don't know. I know it's very complex but – and I'm willing to pay the highest rates in the country with Santa Fe and that always gets quoted. And I'm always challenged when someone says let's use that money for something else. You know, let's keep that money for the water system and use it for that purpose. Thank you very much for your time.

CHAIR ROYBAL: Thank you. Okay, did we have any other speakers? No, okay, so I'll close that. Thank you, sir.

10. Report from the Executive Director

MR. VOKES: Mr. Chair, members of the Board, I will do this quickly. Just to give you an update on vacancies, we are down to three vacancies and they are all operator positions. We are going to advertise this month and hopefully interview and fill some of those positions next month. So we're doing well in the vacancy area.

I also wanted to point out that our MOU, memorandum of understanding, with the Department of Energy and the BDD Board was signed and so that is completed and we will be posting that on the website and I will also send copies to the Board so that you will have those. We just received that this week so that's why you haven't seen that yet. And with that, I will answer any questions or concerns that the Board may have.

CHAIR ROYBAL: Any questions from the Board? Thank you, Mr. Vokes. Are there any additional questions on the consent agenda?

MS. LONG: Mr. Chair, that was approved.

DISCUSSION AND ACTION

13. Request for approval of payment to the Bureau of Land Management in the amount of $74,565.65 for BDDB Right-of-Way rental fees

MS. ROMERO: Mr. Chair, members of the Board, we are requesting approval of payment to the Bureau of Land Management for our right-of-way rental agreements. The first lease payment of $63,000 is for use of 31.7 acres of land which includes the water treatment plant and the solar site. The next lease payment of $8,036.64 is for 4.7 acres of land and this is for our Booster Station 2A solar array. And the last least payment of $3,529 is for a 10-year rental period of 12.23 acres of land and this for our fiber optic lines. So the total request for payment is $74,565.65. These amounts were included in our current operating budget and I'll stand for any questions.

CHAIR ROYBAL: Do we have any questions from the Board? Commissioner Hansen.

COMMISSIONER HANSEN: So the $63,000, that's for one year?

MS. ROMERO: That's correct.

COMMISSIONER HANSEN: And is this not the land that is going to be – that the BLM is thinking of transferring to the State? Is that the next item on the agenda?

MS. LONG: Yes, Mr. Chair and Commissioner Hansen, you are correct. These are interrelated items and these are at least from what we can tell from the information that we have received thus far, at least portions of these rights-of-way are slated to exchange between the BLM and the State Land Office.

COMMISSIONER HANSEN: I attended the meeting the other day about this exchange and I questioned these transfers. One, because it would be much more expensive if this land is transferred to the state and two, the El Camino Real de Tierra Adentro borders this property therefore, BLM would not be really interested in getting rid of their trail system. They have overextended – it's quite lopsided. They have over 70,000

acres for 31,000 acres so they have actually set aside a lot more acreage. So I put on there that I wanted a presentation at the Board of County Commissioners about this because it is very concerning to me that our price for the lease would be increased to such a high amount. They were very kind. They also printed out a large map for me. [Map was displayed] So that everyone can see this is the piece of land that we're talking about here and there seems to be two parcels and I think they're both in the City. This is the whole state and this is what they blew-up for me. So it was a very interesting – I questioned both of these because I wasn't sure what the intention was but for us to have to pay considerably more if this is state land that really concerns me financially. I think getting it in perpetuity, which is the next item on the agenda, is important. But it's only this piece of land that you're speaking about to get I perpetuity.

MS. LONG: Commissioner Hansen, that's my understanding. It is just those portions that are the subject of the exchange.

COMMISSIONER HANSEN: At the moment when I spoke with BLM, the deputy director, yesterday I think it was yesterday, sometime this week, I expressed that I was concerned and that I didn't think that land should be transferred. So I just wanted to share that piece of information with everybody.

MS. LONG: And it is a proposed transfer, you are correct. They are taking public comment. They are considering it. We don't know if it will actually go through or not.

COMMISSIONER HANSEN: Yes, and that's why I did put in public comment. I suggest that everybody on this Board put in public comment and recognize their concerns. I would suggest that the City of Santa Fe also request a meeting or a presentation by the State Land Office or the BLM whoever is doing the presentation. But, I went because it's in my district and it's the Buckman and I was notified about it. I don't know who sent me the notification but it got on my agenda. I wake up in the morning, look at my phone and it was there.

COUNCILOR HARRIS: Mr. Chair, if I may.

CHAIR ROYBAL: Yes, Councilor Harris.

COUNCILOR HARRIS: Commissioner Hansen, I'm willing to follow-up certainly. Maybe if you could just provide contact information for the individuals that you're talking to at the State Land Office as well as the BLM.

COMMISSIONER HANSEN: I can. I have that in my office. They gave me a couple of different lists and I have one copy I think of the public comment form that we can possibly make copies of.

COUNCILOR HARRIS: Okay, because at this point I am unfamiliar.

COMMISSIONER HANSEN: I was completely unfamiliar.

COUNCILOR HARRIS: So I'm glad you went really and truly. But I am willing to follow-up so if you can provide that for me I will commit to that.

COMMISSIONER HANSEN: Absolutely.

CHAIR ROYBAL: Commissioner Hamilton.

COMMISSIONER HAMILTON: Commissioner Hansen, so the idea is that if this transfer goes through, lease cost for that piece of land to the BDD are going to go up? Did we know that before?

MS. LONG: This next item that we're talking about on the agenda is if we had certain options that were presented to Buckman based on this transfer. So when a

transfer, by regulation, when a transfer is proposed the owner of the right-of-way has certain options. One is do nothing and by the way you're going to have a new landlord and this is will be the State Land Office. And that's what I think what you were hearing is those prices could go up. You can also apply to, instead of having a 30-year term easement which is what we have with 20 years left, 20 something years left, you can apply to have that easement be in perpetuity. So basically you have it forever and you make a one-time payment and any payments that we're making now for this next year's lease would be credited towards that if it is approved. So if it was not approved for whatever reason and we don't know yet because we haven't submitted the application to see what the feedback might be, then we very well could end up with the State Land Office at least for portions of it which is not – it didn't seem from the people I was talking to at the BLM that they were recommending that at. They were really steering me in the direction of, you may want to take this opportunity and apply for the perpetuity status so that you don't have split jurisdictions possibly and also because it's an opportunity that you don't have otherwise to own it in perpetuity and here this landed on your doorstep and maybe you ought to take advantage of it. That's what I was hearing.

COMMISSIONER HAMILTON: Thank you.

CHAIR ROYBAL: Councilor Ives.

COUNCILOR IVES: Thank you, Mr. Chair. So tell me if we do, we are certainly bleeding over into item 14, so if we exercise the option to do it in perpetuity which sounds like it is our option, which is great, what does that do to the capacity of the underlying owner to charge rent?

MS. LONG: We would pay a one-time charge. We don't know what that is. We assume it will be fair-market value appraisal, sort of, determination that is made. So that it still be with BLM but it gets converted to perpetuity so the State Land Office will never have that. The land would be exchanged if it's approved presumably, but they could never charge for that because we've already made the one-time charge with BLM.

COUNCILOR IVES: So it really almost sounds like an acquisition of the land in the form of a perpetual lease rather than a transfer of the fee title.

MS. LONG: That's correct. Exactly.

COUNCILOR IVES: Thank you.

COMMISSIONER HANSEN: Councilor Ives.

CHAIR ROYBAL: Commissioner Hansen.

COMMISSIONER HANSEN: Councilor Ives, it's a patent. We would get a patent on this land; isn't that correct?

MS. LONG: There is another provision I think that allows for a patent. There are just basically four options that kind of gets you to the same place in the perpetuity, they just call them different names. But they were recommending the perpetual easement.

COMMISSIONER HANSEN: Okay, okay.

COUNCILOR IVES: Can you share the – I'd love to look at the legal --

MS. LONG: The letter we received?

COUNCILOR IVES: Yes, the letters you received as well as the underlying statutory context.

MS. LONG: That would be the regulation and I can get that to you.

COUNCILOR IVES: Okay, yes.

COMMISSIONER HANSEN: Mr. Chair.

CHAIR ROYBAL: Commissioner Hansen.

COMMISSIONER HANSEN: I would like to move to approve the request of payment to BLM in the amount of $74,565.65.

COUNCILOR IVES: Second.

CHAIR ROYBAL: Motion and a second. The motion carried. [See below for corrected motion]

14. Request for approval to file an application to convert to perpetuity the BLM Right-of-Way permits for the BDD Project

CHAIR ROYBAL: I think we have talked about this already but are there any additional questions? If not, I would entertain a motion.

COUNCILOR HARRIS: So moved.

COUNCILOR IVES: Second.

The motion passed by unanimous voice vote.

13. (corrected)

MS. LONG: Before we move to the next item, there has been an issue raised here about Commissioner Hansen making a motion because both commissioners are here and that was on the payment to the BLM. So if --

COMMISSIONER HANSEN: I think somebody else needs to make that motion and I apologize.

MS. LONG: So if we could go back to that item and say it will be correcting the vote on that. I think because we're not at our usual places at the City with separate tables, it gets confusing.

COUNCILOR IVES: I would so move.

CHAIR ROYBAL: Councilor Ives has moved and I think we had a second from Commissioner Hamilton.

COMMISSIONER HAMILTON: I don't remember; yes, I seconded that.

MS. LONG: Yes, and maybe take another vote for clarification.

CHAIR ROYBAL: Councilor Ives has made the motion and we'll need a second since he seconded the last motion.

COMMISSIONER HAMILTON: I second.

The motion passed by unanimous voice vote.

15. Request for approval of Amendment No. 5 to the Professional Services Agreement with Alpha Southwest, Inc. for the Raw Water Lift Station pump rebuild project for the amount of $120,000.00 exclusive of NMGRT

a. Request for approval of a Budget Amendment Resolution to authorize funds from the Major Repair and Replacement Fund to cover the cost of the project

MS. ROMERO: Mr. Chair, members of the Board, on June 1, 2017 the BDD Board approved our request to amend our yearly on-call service agreement with Alpha

Southwest which is used to support our current BDD maintenance resources and the repair and maintenance of BDD facilities and equipment.

Since this approval staff has identified the need to rebuild four pumps and motors which are located at the raw water lift station facility. The initial estimated cost to rebuild the pumps and recondition the motors is $30,000 apiece; therefore, this request is for Amendment #5 to increase compensation by $120,000. This request also includes an approval of a budget amendment resolution to authorize funds from the Major Repair Replacement Fund as this project does meet the criteria as established in the policy. Are there any questions?

CHAIR ROYBAL: Any questions from the Board?

MEMBER FORT: I have a question of legal counsel that this is in accordance with the procurement code?

MS. LONG: I did not, Member Fort, I think that we did have review of this through Procurement initially.

MS. ROMERO: Yes. The City of Santa Fe issued an RFB just for on-call services for mechanical and electrical repair, technically an on-call contract and that's the current contract that we are using for this particular service.

MEMBER FORT: But an amendment within this amount is also within the procurement code?

MS. ROMERO: Yes, that is part of the RFB.

COUNCILOR HARRIS: And if I could say this is year four of four.

MS. ROMERO: Yes, this is the final year for the RFB for Alpha Southwest any future on-call services would have be through a request for proposal.

CHAIR ROYBAL: Okay, thank you. Any other questions from the Board? If not, I'll entertain motion.

COUNCILOR HARRIS: Move to approve.

COUNCILOR IVES: Second.

The motion passed by unanimous [5-0] voice vote.

CHAIR ROYBAL: Motion passes. Thank you, Mackie.

MS. ROMERO: Thank you.

MATTERS FROM THE PUBLIC

None were presented.

MATTERS FROM THE BOARD

CHAIR ROYBAL: Any matters from the Board? Any announcement or any other questions or matters?

COMMISSIONER HANSEN: I would like to make one statement. I thought it was very interesting at the BLM land transfer; I was the only elected official who came. I think there could have been better notice. I think it is a very important issue for BLM holders of leases. I take that back, actually Robert Anaya was there but he was there on a personal matter so he wasn't there in an elected official capacity.

CHAIR ROYBAL: Commissioner Hamilton.

COMMISSIONER HAMILTON: I actually think that's a very useful comment because when you ask why wasn't anyone else there, I'm not sure anybody else really knew about it. It was not on my radar screen at all and I don't think it's for lack of paying attention. Not that I'm not guilty of that sometimes – or a lot sometimes. So I think that's really something to think about and I don't know what possible actions.

COMMISSIONER HANSEN: There were lots of people from all over the state. Maybe there were 30 people, individuals, half of them were staff, more than half were staff. There was maybe 30 people there and maybe there was I would say 10 people who are concerned about their land being transferred to the state.

CHAIR ROYBAL: I appreciate those comments and I think it is very important that we figure out a way to get more communication from the BLM. If we could bring that up to staff maybe on the City and the County side for a way for us to reach out to the BLM and find out how everybody else was notified so that we can get on that mailing list.

COMMISSIONER HANSEN: Yeah, I think that's really important and that was why I asked for all the contact information and I will definitely make sure everybody gets that.

CHAIR ROYBAL: Thank you, Commissioner Hansen.

COMMISSIONER HAMILTON: Great.

CHAIR ROYBAL: Okay, I will state for the record and our minutes that the only matter discussed during our executive session of our last Board meeting on October 5, 2017 was the matters as stated in the motion to go into executive session and no action was taken. Do we have any other comments from Board members? If not, we'll move on.

NEXT REGULAR MEETING: Thursday, December 4, 2018@ 4:15pm

EXECUTIVE SESSION

In accordance with the New Mexico Open Meetings Act NMSA 1978 Section 10-15-1(H)(7), discussion regarding threatened or pending litigation in which the BDDB is, or may become a participant, including without limitation: Discussion regarding Diversion Structure issues

CHAIR ROYBAL: Is there a need for executive session?

MS. LONG: Yes, Mr. Chair. We have that on the agenda. Mr. Chair, if we could have a motion to adjourn and to go into executive session for the purpose as stated on the agenda, that would be helpful.

CHAIR ROYBAL: Okay. Motion to adjourn?

COUNCILOR IVES: So moved.

COMMISSIONER HAMILTON: Second.

CHAIR ROYBAL: Motion and second.

Motion passed by unanimous voice vote.

CHAIR ROYBAL: So do we need a motion to go into executive?

MS. LONG: Yes, Mr. Chair, for the purposes as stated on the agenda and then a roll call vote.

COUNCILOR IVES: So moved.

MEMBER FORT: Second.

CHAIR ROYBAL: Roll call, please

The motion to go into executive session passed by unanimous [5-0] voice vote with the following BDD Board members voting in the affirmative: Councilor Ives, Councilor Harris, Commissioner Hamilton, Board Member Fort and Chair Roybal.

ADJOURNMENT

Having completed the agenda, Councilor Ives declared this meeting adjourned at approximately 6:55 p.m.

Approved by:

4/7/18

Henry Roybal, Board Chair

Respectfully submitted:

Karen Farrell, Wordswork

ATTEST TO:

GERALDINE SALAZAR
SANTA FE COUNTY CLERK

BUCKMAN DIRECT DIV MIN
PAGES: 61

COUNTY OF SANTA FE)
STATE OF NEW MEXICO) ss

I Hereby Certify That This Instrument Was Filed for Record On The 10TH Day Of April, 2018 at 01:04:22 PM And Was Duly Recorded as Instrument # 1854629 Of The Records Of Santa Fe County

Witness My Hand And Seal Of Office
Geraldine Salazar
Deputy _____ County Clerk, Santa Fe, NM

SFC CLERK RECORDED 04/10/2018

EXHIBIT
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The CHROMIUM campaigns

The Chromium Project

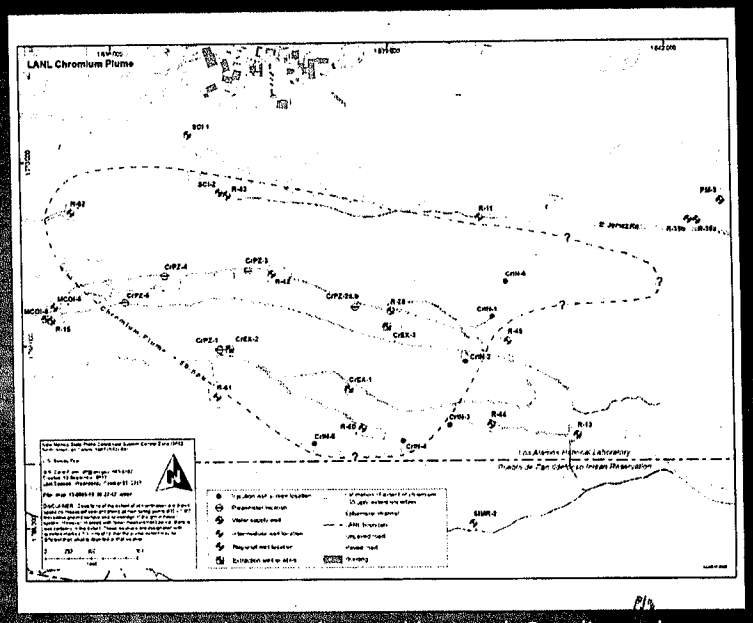
- A hexavalent chromium plume above the New Mexico groundwater standard of 50 parts per billion is present in the regional aquifer beneath Sandia and Mortandad canyons.

- The aquifer is 900–1,000 feet below ground surface. The plume is approximately one mile long x one-half mile wide and is located within the top 100 feet of the aquifer.

- Los Alamos County works closely with the Department of Energy and the Laboratory on their actions to address the plume. There is no contamination of chromium in any drinking water production wells.

- The Department of Energy and the Laboratory are taking action as part of their commitment to protect groundwater, the health and safety of New Mexico residents and the environment.

- The near-term goal (via the Interim Measure) is to control migration of the chromium plume while the Laboratory assesses the best cleanup method.



The chromium plume is located beneath Sandia and Mortandad canyons.

Storage basins in Mortandad Canyon store treated groundwater prior to land application.

Los Alamos NATIONAL LABORATORY

LA-UR-17-30811

Fall 2017

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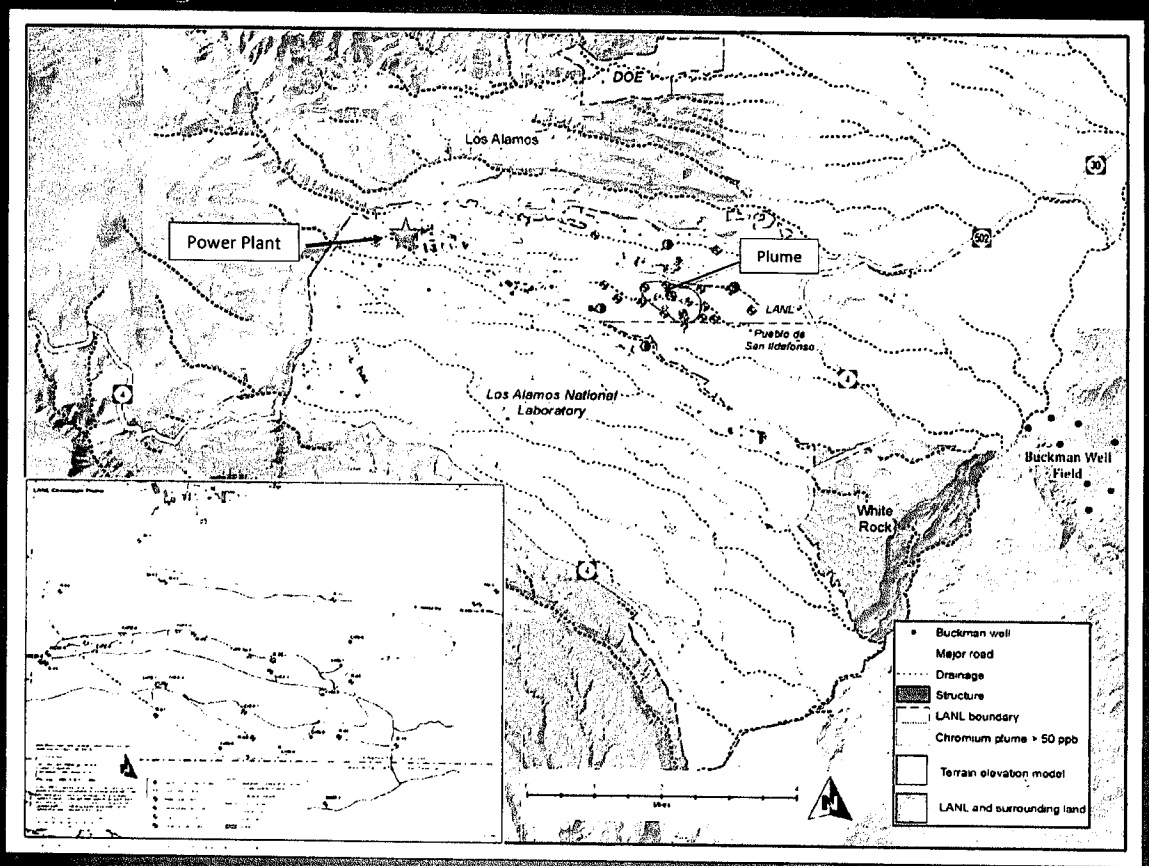
The CHROMIUM campaigns

A History of the Chromium Issue



- From 1956 to 1972, a non-nuclear power plant at Los Alamos National Laboratory periodically flushed water out of its cooling towers into Sandia Canyon. At that time, chromium was commonly used in the industry as a corrosion inhibitor in cooling tower systems.

- The water with chromium flowed down Sandia Canyon as surface water, penetrated the underlying rock layers, and ultimately seeped into the regional aquifer beneath Sandia and Mortandad canyons, the present location of the plume.

- The Laboratory discovered chromium in the regional aquifer during the installation of a groundwater monitoring well in late 2005.

- Since then, the Laboratory has conducted detailed scientific characterization of the nature and extent of the plume, involving the installation of 19 wells. The characterization of the plume provides the foundation for the development of a comprehensive remediation strategy. The Laboratory has also begun implementation of an Interim Measure to control plume migration.

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The Los Alamos National Laboratory CHROMIUM campaigns

The Interim Measure

- The Department of Energy and the Laboratory have identified the need to conduct the Interim Measure to hydraulically control the downgradient migration of the chromium plume. The Interim Measure, approved by the New Mexico Environment Department, is needed to address the increasing concentration of chromium at the Laboratory boundary.

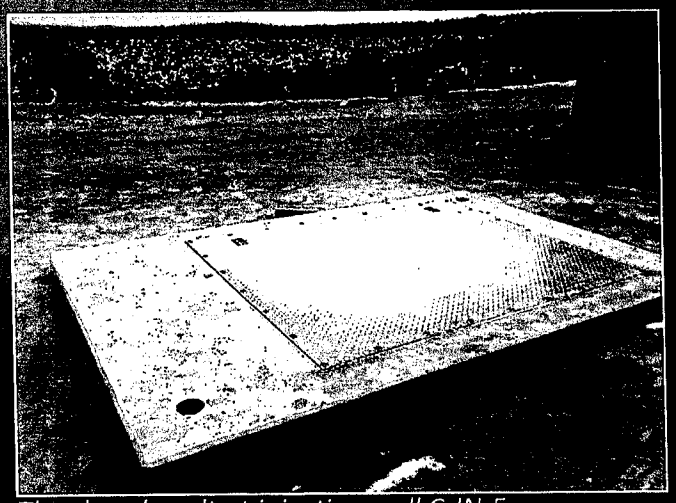
- The goal is to achieve and maintain less than 50 parts per billion of chromium contamination at the plume edge within the Laboratory boundary.

- The Interim Measure consists of extraction and injection wells, a centrally located treatment system, and piping and infrastructure tying it all together. Contaminated water will be extracted and treated. The treated water will then be injected along the plume edge.

- Chromium concentrations will be reduced at the plume edge and the plume footprint will be reduced in size.

- The Interim Measure will take place over the next several years until a final remedy has been identified and implemented.

An angled drill was used to install the injection well CrIN-4 and avoid sensitve areas.



The closed vault at injection well CrIN-5 helps reduce the project's footprint.

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Fall 2017

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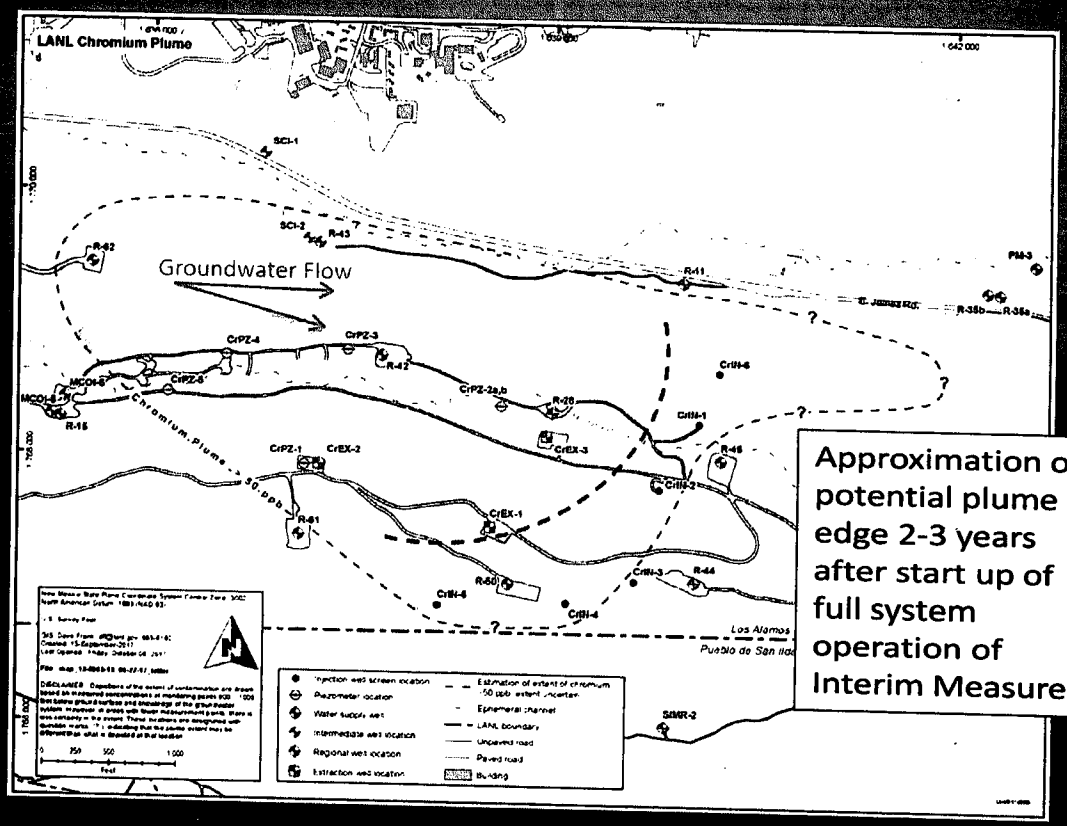
The CHROMIUM campaigns

The Path Forward

- In January 2018, the Interim Measure will be restarted along the Laboratory boundary with the Pueblo de San Ildefonso.
- Pumping from extraction wells will begin, with the injection of treated water into the injection wells CrIN-3, -4, and -5.
- In early 2018, a decision will be made on full-scale Interim Measure operations that include activities along the eastern edges of the plume.
- Small-scale tests will continue to be conducted to evaluate the ability to convert (change) hexavalent chromium to trivalent chromium in the aquifer. Trivalent chromium is considered an essential nutrient and doesn't move in groundwater.
- Testing will progress from small-scale tests performed in a laboratory to larger scale tests implemented in the field.
- These tests are part of the development of final remedial options that will be presented in a Corrective Measures Evaluation Report to the New Mexico Environment Department.



Los Alamos NATIONAL LABORATORY

Fall 2017

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EXHIBIT
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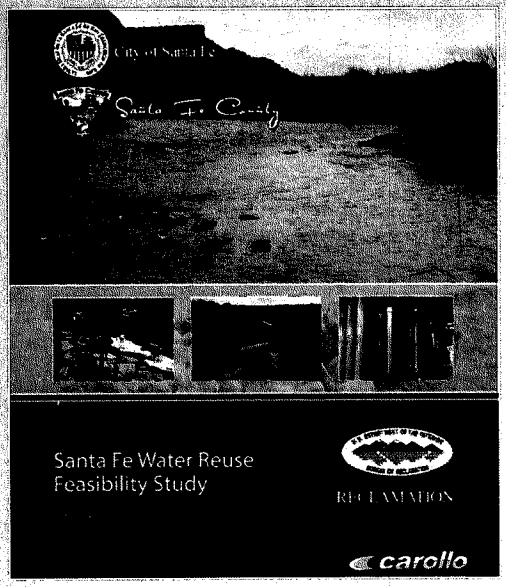
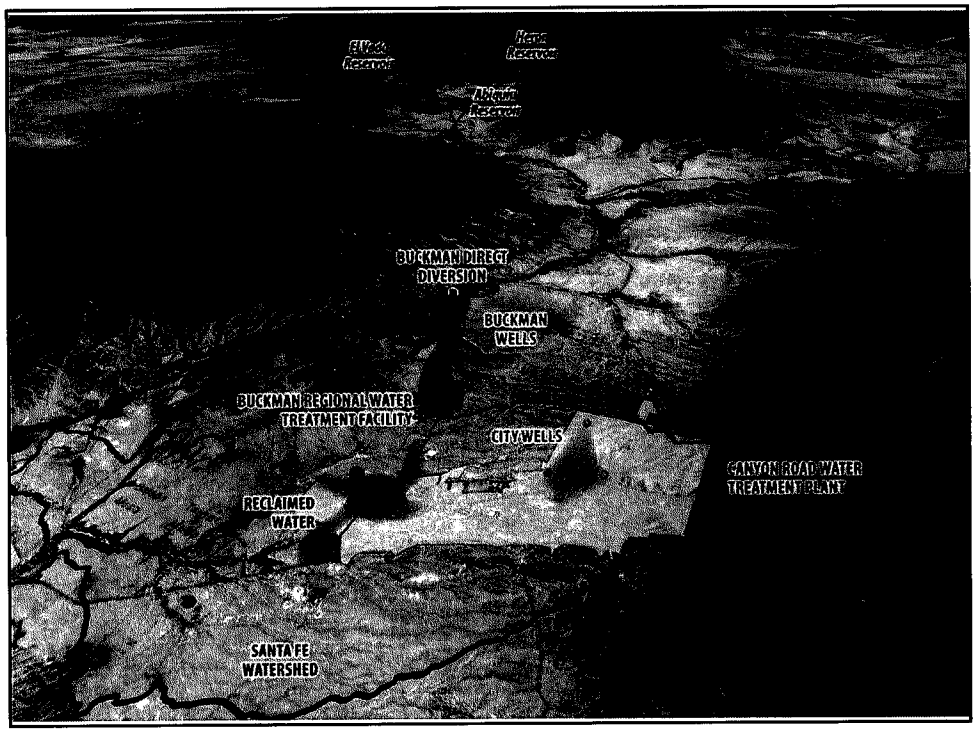
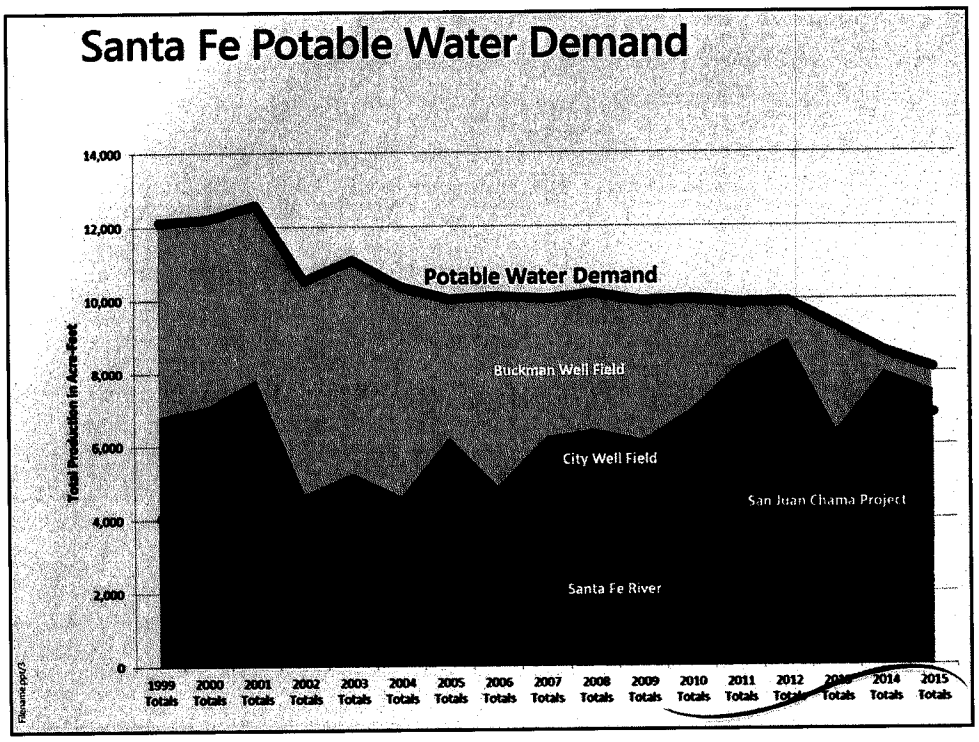
Santa Fe Water Reuse

Planning, Status, and Next Steps

November 20, 2017






Santa Fe Potable Water Demand
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Total Production in Acre-Feet
Potable Water Demand
Buckman Well Field
City Well Field
San Juan Chama Project
Santa Fe River
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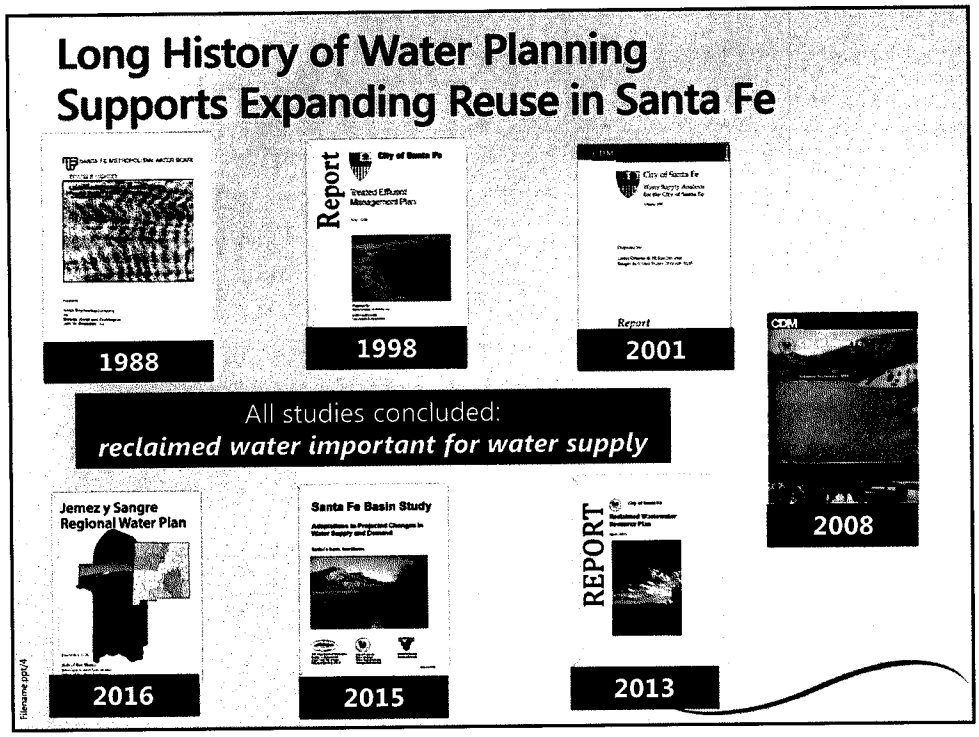

Long History of Water Planning Supports Expanding Reuse in Santa Fe
1988
Report
Treated Effluent Management Plan
1998
City of Santa Fe
Report
2001
CDM
2008
All studies concluded:
reclaimed water important for water supply
Jemez y Sangre Regional Water Plan
2016
Santa Fe Basin Study
2015
REPORT
2013
Filename.ppt/4

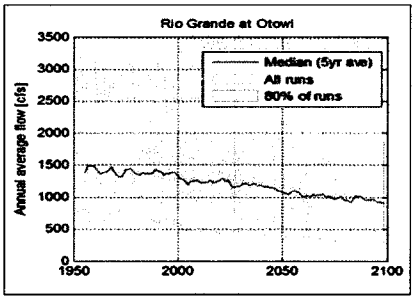
Santa Fe Basin Study

Adaptations to Projected Changes in Water Supply and Demand

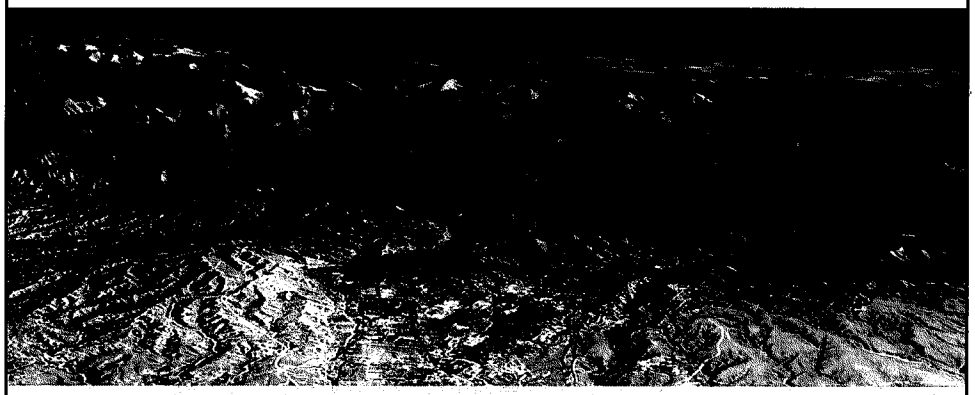
Santa Fe Basin, New Mexico

August 2015

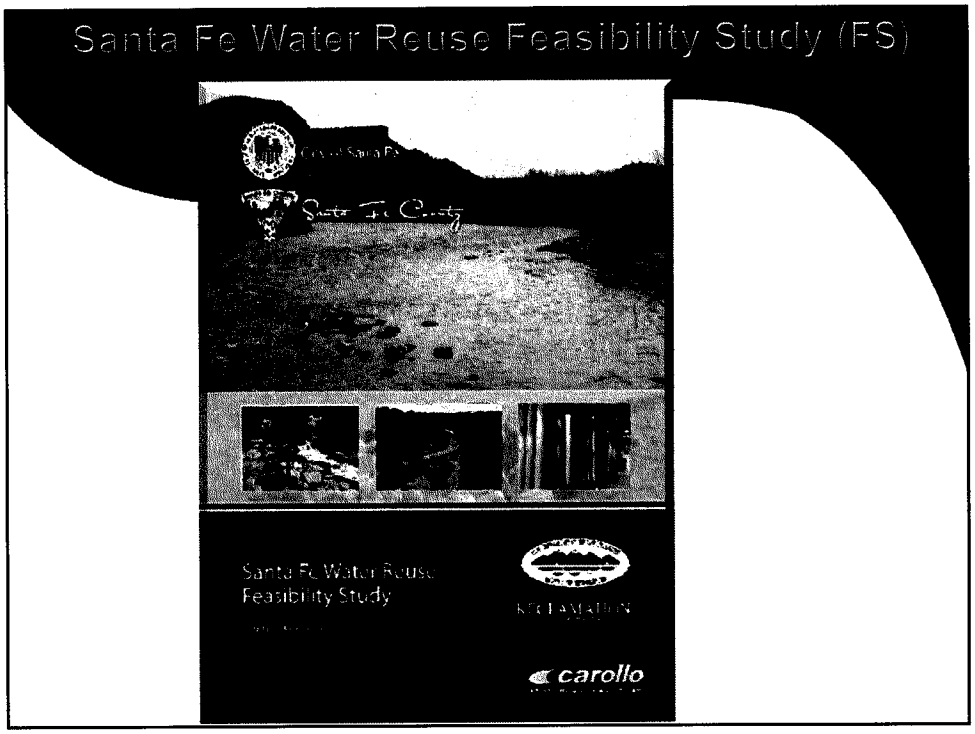
- Shortages may reach 9,300 AFY under hottest-driest scenarios for the City-County by 2055

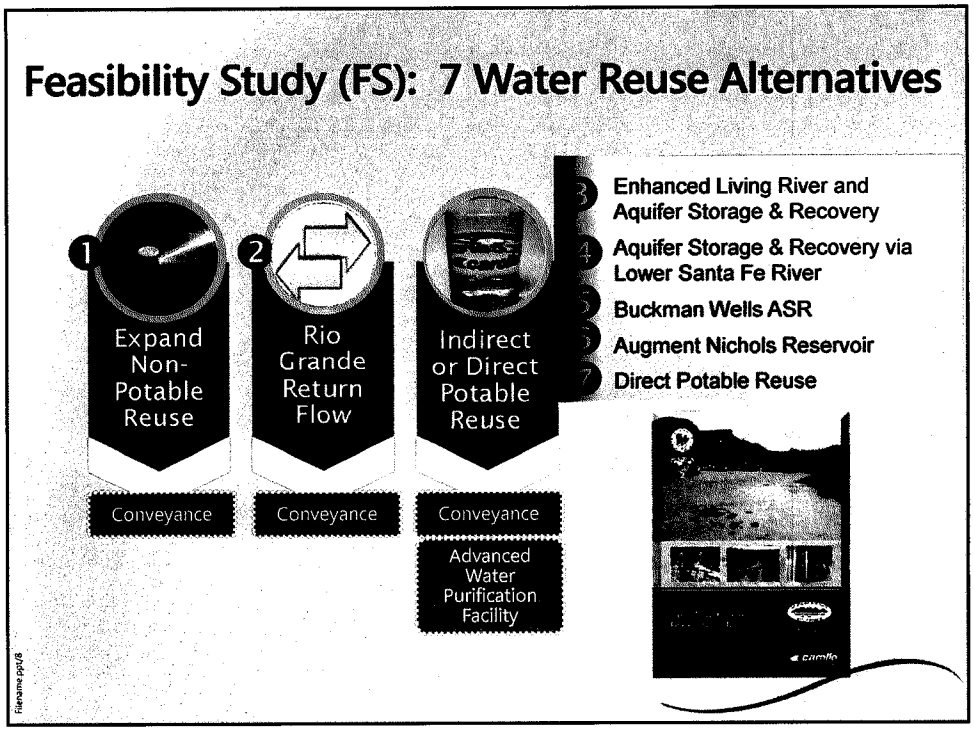


Basin Study Drought Adaptation Strategies

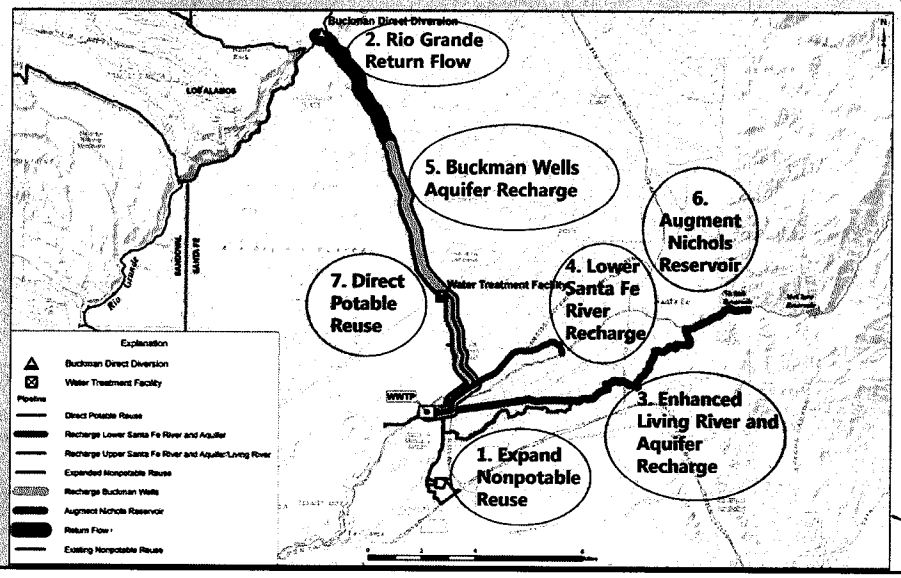


- Expand Water Conservation
- **Expand Water Reuse**
- Optimize Aquifer Management (drought reserve)
- Aquifer Storage and Recovery (ASR)
- Storm water Harvesting


Santa Fe Water Reuse Feasibility Study (FS)
Santa Fe Water Reuse Feasibility Study
carollo


Feasibility Study (FS): 7 Water Reuse Alternatives
1
Expand Non-Potable Reuse
2
Rio Grande Return Flow
Indirect or Direct Potable Reuse
3 Enhanced Living River and Aquifer Storage & Recovery
4 Aquifer Storage & Recovery via Lower Santa Fe River
5 Buckman Wells ASR
6 Augment Nichols Reservoir
7 Direct Potable Reuse
Conveyance
Conveyance
Conveyance
Advanced Water Purification Facility
Filename.ppt/8

Location Map of FS Water Reuse Alternatives

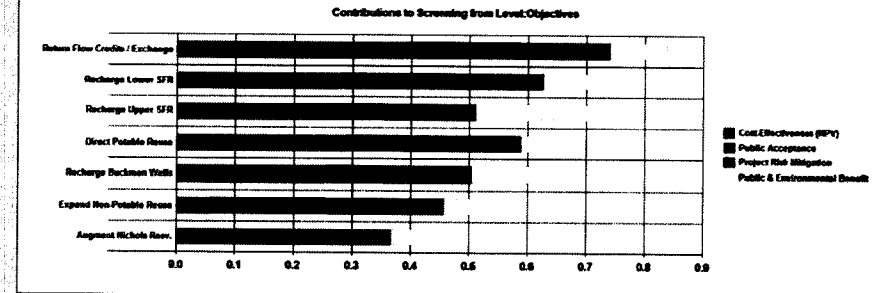


Filename.ppt/9

Screening of 7 FS Water Reuse Alternatives

Criterion	Profile 1 Weight	Profile 2 Weight
Cost-Effectiveness	40%	30%
Public and Environmental Benefit	20%	20%
Public Acceptance	20%	20%
Project Risk Mitigation	20%	30%

Weighted Decision Scores: Profile 1



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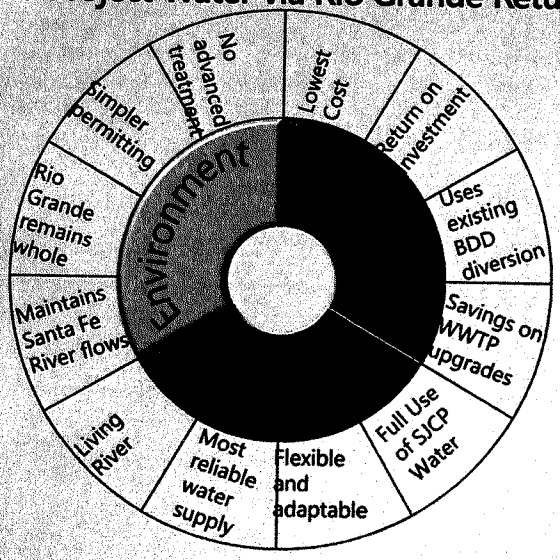
Highest Rated FS Alternative is Full Consumption of San Juan Chama Project Water via Rio Grande Return Flow



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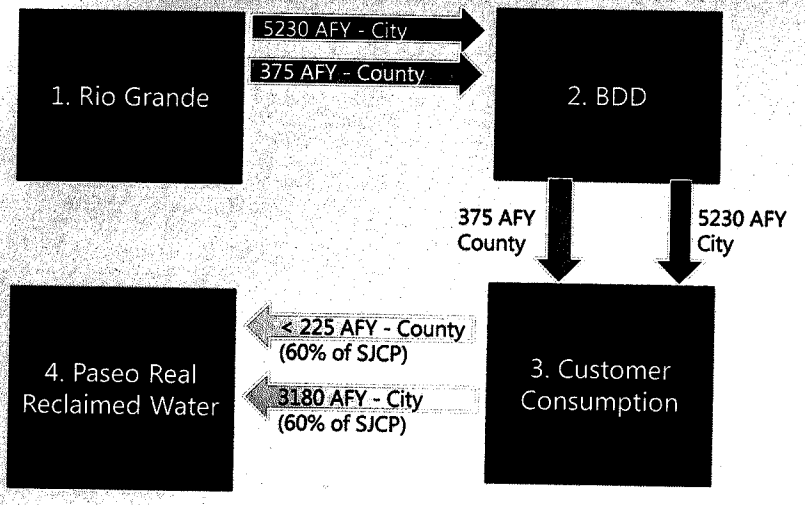
Current BDD Operations: 40% Consumption of SJCP Water



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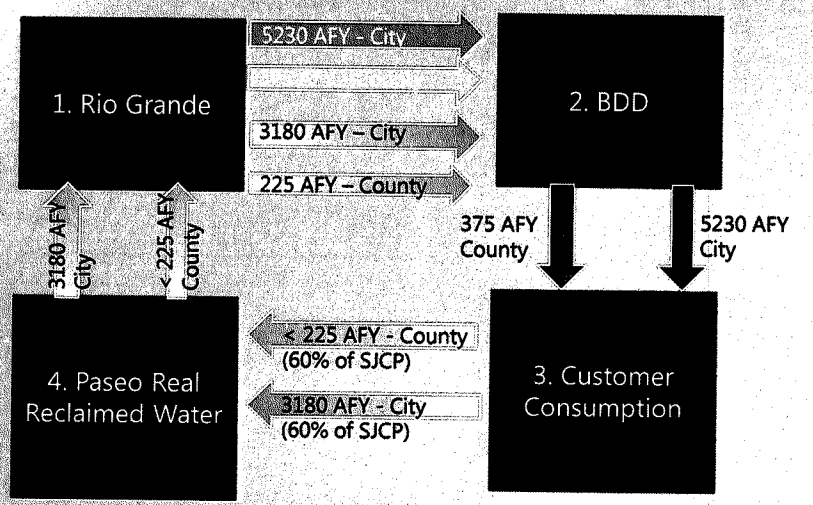
Future BDD Operations (proposed): 100% Consumption of SJCP Water



Value to City = 3180 AFY * 20K = $63.6M

Value to County = 225 AFY * $20K = $7.5M

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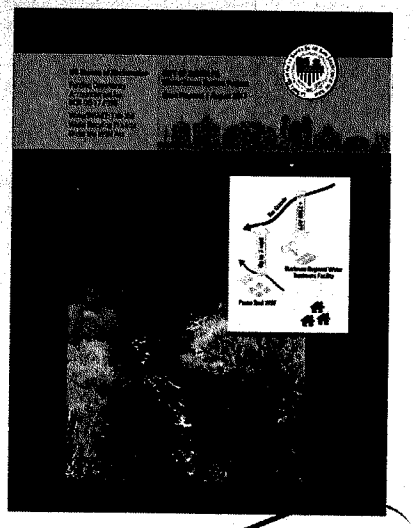
BDD-related Challenges with 100% Consumption of SCJP Water Alternative

- Cost impacts to operations and maintenance
- Revisions to BDD Permitting
  - Diversion 8,730 AFY Limit
  - NPDES sediment return
  - Rights-of-way
  - NEPA Special Use
  - NMED system
- Water System Resiliency
  - drought, fire, environmental



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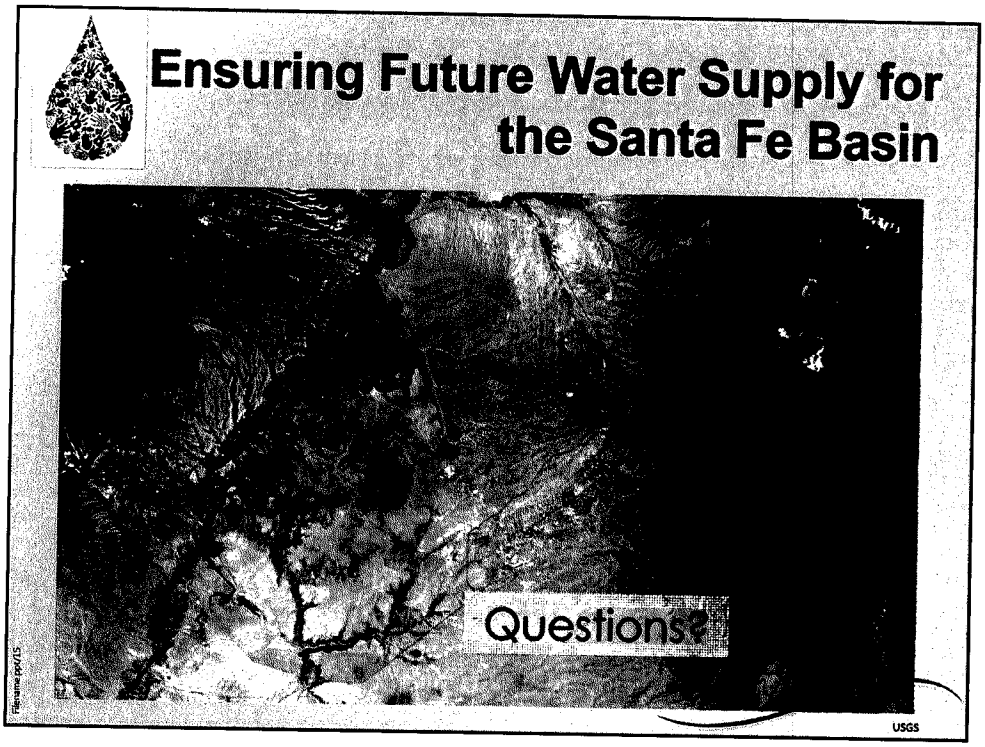
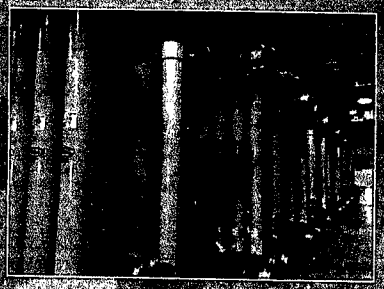

Ensuring Future Water Supply for the Santa Fe Basin
Questions?
USGS

EXHIBIT
3

City of Santa Fe

Santa Fe County



Santa Fe Water Reuse Feasibility Study

EXECUTIVE SUMMARY

April 2017

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RECLAMATION
Managing Water in the West

carollo
Engineers...Working Wonders With Water®

Executive Summary

The City of Santa Fe (City) and Santa Fe County (County) provide water service to over 85,000 people in northern New Mexico. One of the oldest cities in the United States, Santa Fe has diversified its water supply to include local surface water and groundwater and imported surface water to reliably meet the community's water needs. The City and County are the non-federal project sponsors that worked in partnership with the Bureau of Reclamation (Reclamation) to develop this Santa Fe Title XVI Feasibility Study (Feasibility Study).

The primary objective of this Feasibility Study is to identify the highest value use of the reclaimed water currently available from the City's Paseo Real Water Reclamation Facility (WRF) and potential future flows from the County's Quill WRF, while respecting downstream flow maintenance for cultural and ecological purposes on the lower Santa Fe River.

This Feasibility Study evaluates reasonable water reuse alternatives to mitigate projected water supply shortages, and ranks those alternatives based upon economic, social, environmental, and technical considerations.

Water supply planning and consideration of future conditions is vital in light of projections that the City and County's service area population will nearly double to about 170,000 by 2055, as documented in the Bureau of Reclamation 2015 Santa Fe Basin Study (Basin Study). The Basin Study highlighted the implications of climate change on Santa Fe area water supplies and demands. Under anticipated climate change conditions, the City and County's supplies are projected to fall short of demands by as much as 9,323 acre-feet per year (AFY) by 2055. The Basin Study identified expansion of water reuse as one of the most viable strategies for mitigating the projected shortages in Santa Fe. That finding motivated the City and County to partner with Reclamation to develop this Feasibility Study to assess alternatives for water reuse.

This Feasibility Study builds on a long-standing commitment to water reuse in Santa Fe, dating back to at least the 1950s. Today, up to about 1,500 AFY of recycled water is used to offset potable demands including: dust control and other construction purposes; irrigation of sports fields and other landscaping at the Municipal Recreational Complex (MRC); infield landscaping at the Downs of Santa Fe, the Santa Fe Equestrian Center, the Marty Sanchez Links de Santa Fe and the Santa Fe Country Club; dust control at the regional landfill; and livestock watering on the Caja del Rio. The City's 1998 Treated Effluent Management Plan (TEMP) provided the impetus for expanding reuse in Santa Fe in the years that followed, and the City's 2013 Reclaimed Wastewater Resource Plan (RWRP) characterized additional opportunities to more fully utilize reusable water from the City's Paseo Real WRF. Contracts for water reuse establish supply and operational requirements, but the City does not recover any cost or value for the water provided to reuse customers. The City has identified the potential opportunity for conservation savings in the use of recycled water at several of these sites.

Seven water reuse alternatives were evaluated in this Feasibility Study, using a structured process for prioritizing improvements toward mitigating the projected climate-change induced shortages. The seven alternatives are:

- **Alternative 1:** Expand Non-Potable Reuse
- **Alternative 2:** Full Consumption of San Juan-Chama Project (SJCP) Water via Rio Grande Return Flow Credits
- **Alternative 3:** Enhanced Living River and Aquifer Storage and Recovery
- **Alternative 4:** Aquifer Storage and Recovery via Lower Santa Fe River
- **Alternative 5:** Aquifer Storage and Recovery via Buckman Well Field
- **Alternative 6:** Augment Nichols Reservoir
- **Alternative 7:** Direct Potable Reuse

A screening-level assessment weighed those seven alternatives against four basic criteria, including Cost Effectiveness, Public and Environmental Benefit, Public Acceptance, and Project Risk Mitigation. This resulted in elimination of Alternatives 1, 5, and 6 from further consideration, as the other four alternatives more fully satisfied these criteria. Expansion of Non-Potable Reuse was found to be significantly less effective in providing a water resource benefit than all others, and was far less cost-effective. Aquifer Storage and Recovery via the Buckman Well Field and Augmenting Nichols Reservoir each had significant potential permitting and implementation challenges and failed to provide benefits comparable to the other alternatives.

The remaining four preferred alternatives provide water supply benefits while supporting the community's values:

- **Alternative 2:** Full Consumption of SJCP Water via Rio Grande Return Flow Credits
- **Alternative 3:** Enhanced Living River and Aquifer Storage and Recovery
- **Alternative 4:** Aquifer Storage and Recovery via Lower Santa Fe River
- **Alternative 7:** Direct Potable Reuse

A more detailed assessment of these four alternatives used a multi-criteria analysis, with particular emphasis on implementation challenges and long- term benefits. The triple bottom line criteria included measures related to the economic, social, and environmental performance of these alternatives, along with key technical criteria, as further described in the Feasibility Study report. The highest-ranked alternative is Alternative 2, Full Consumption of SJCP Water via Rio Grande Return Flow Credits.

This Executive Summary highlights the four preferred alternatives, and the overall greater value to the community of the highest-ranked alternative.

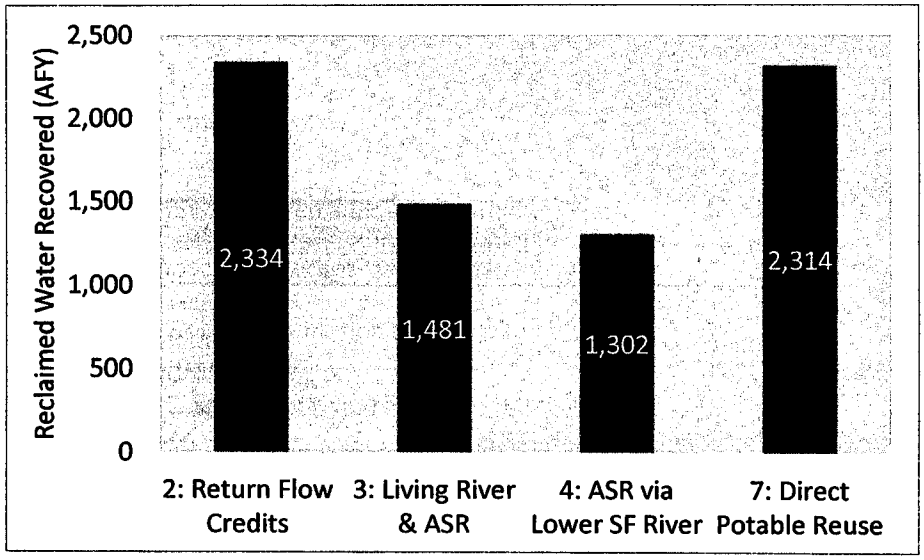
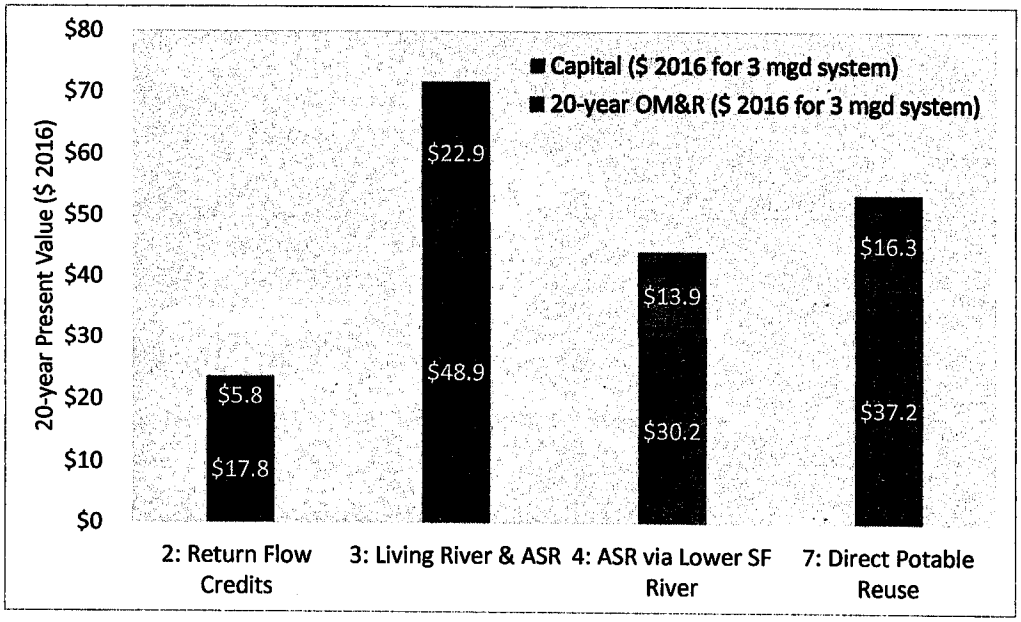


Figure ES-1: Net yields for the preferred alternatives. Any of these alternatives could provide a significant benefit toward avoiding the projected water supply shortages in Santa Fe.

Figure ES-2: Detailed screening-level capital and operations, maintenance and replacement (OM&R) components of net present value (NPV) costs for the preferred alternatives.



Alternative 2: Full Consumption of SJCP Water via Rio Grande Return Flow Credits

This alternative includes constructing a new pipeline to convey reclaimed water from the Paseo Real WRF to a point of discharge to the Rio Grande just downstream of the Buckman Direct Diversion (BDD) diversion site to obtain return flow credits for exchange, using return flows generated from diversions of Santa Fe's SJCP contract water delivered via contract with the Bureau of Reclamation.

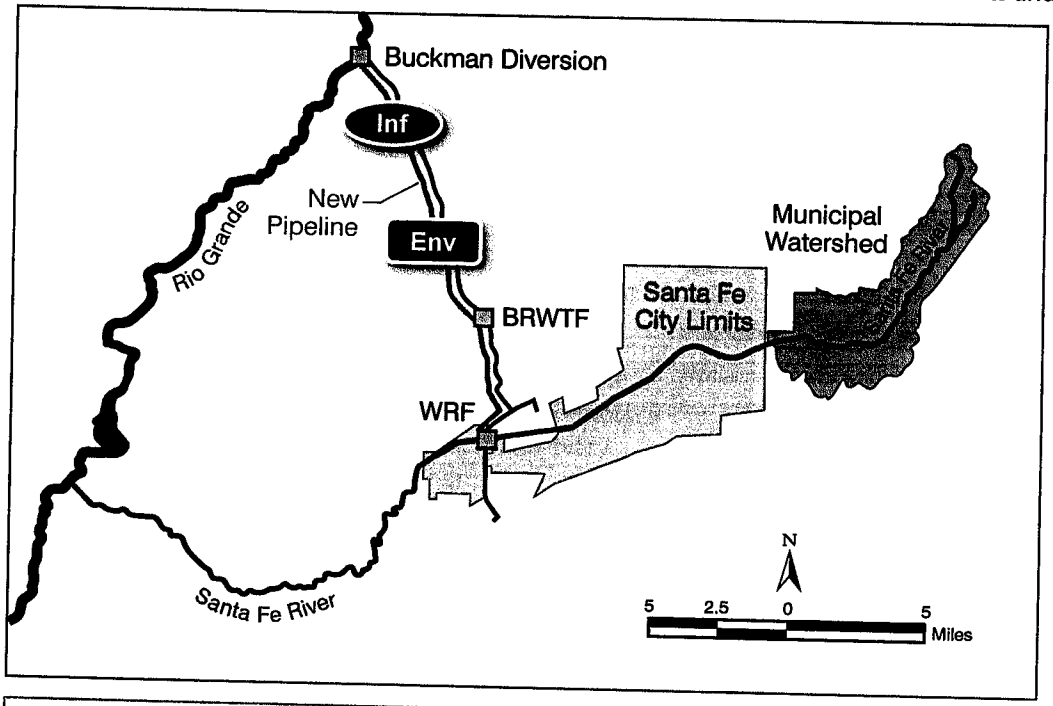
Previous analyses and state precedent indicate that the exchange would allow Santa Fe to divert one acre-foot of additional water through the BDD system for every one acre-foot of reclaimed water discharged (i.e., a one-for-one exchange). The Albuquerque Bernalillo County Water Utility Authority operates a similar exchange on the Rio Grande, demonstrating the feasibility of this alternative in New Mexico.

Reclaimed water would be pumped to the Rio Grande and exchanged for increased diversions through the BDD system under Alternative 2.

The exchange would allow Santa Fe to increase the amount of water diverted and treated through the BDD system, while maintaining the existing BDD conveyance and treatment infrastructure capacity at 15 million gallons per day (mgd). Given Santa Fe's present rate of consumption of 40 percent of the water diverted, were the City to pursue Return Flow Credits and account for repeated cycles of returns, it could increase the amount of consumable water that could be pulled from the BDD diversion by 150 percent, for an overall multiplier of 2.5 times the original consumable water right.

By making this exchange, this alternative comprises an indirect way of reusing the available reclaimed water while not actually diverting, treating, or distributing reclaimed water to Santa Fe's customers. The return flow discharge point was conceptually located immediately downstream of the BDD diversion, to avoid having any significant length of the Rio Grande being impacted by the diversion upstream of return flows. Figure ES-3 is a schematic of this process.

Figure ES-3: Full Consumption of SJCP Water via Rio Grande Return Flow Credits.



LEGEND

Env **Environment/ Permitting:** Environmental studies needed for pipeline corridor.

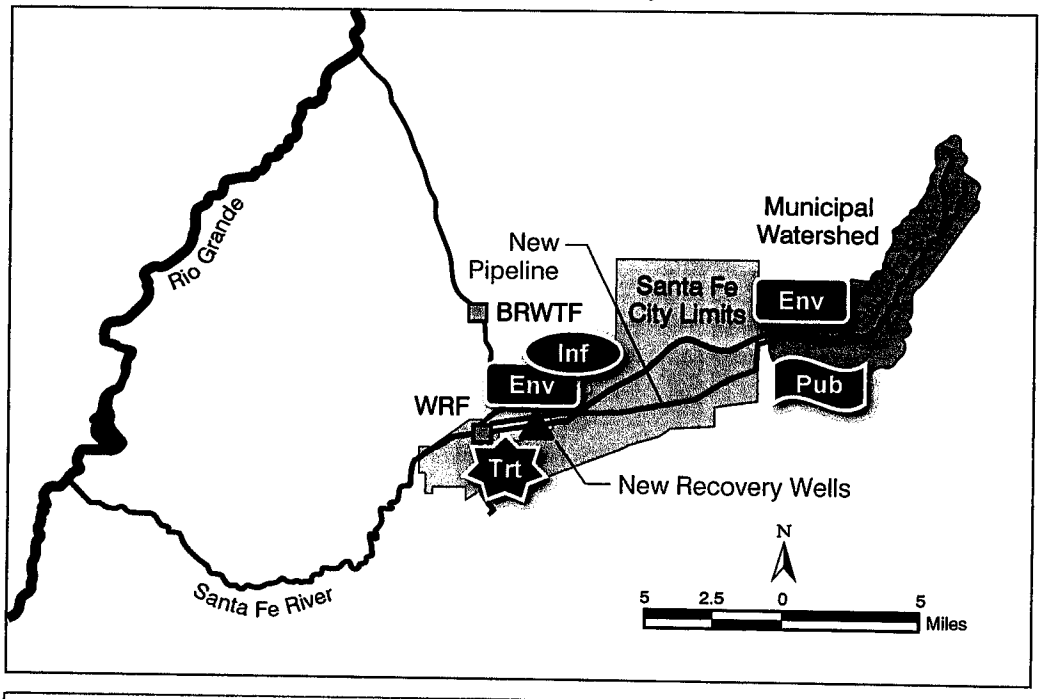
Inf **Infrastructure:** Pump station, 17.7-mile pipeline.

Alternative 3: Enhanced Living River and Aquifer Storage and Recovery

This alternative involves advanced treatment of up to 3 mgd of reclaimed water from the Paseo Real WRF to a new Advanced Water Purification Facility. From there, the water would be conveyed and discharged to the Upper Santa Fe River near the Two-Mile Reservoir site for recharge of the local aquifer and supplementing bypass flows from McClure and Nichols Reservoirs for a Living River in the downtown area. Water recharged to the aquifer would be withdrawn through new recovery wells in the Lower Santa Fe River and pumped into the potable water distribution system. While this approach to intentional aquifer recharge would be somewhat unique, aquifer recharge and recovery using purified recycled water is practiced in several communities in Arizona, California, and elsewhere.

Reclaimed water would be pumped to the Two-Mile Reservoir site on the upper Santa Fe River to augment living river bypass flows from the reservoirs and recharge groundwater in Alternative 3.

Figure ES-4: Enhanced Living River and Aquifer Storage and Recovery.



LEGEND

Env — **Environment/ Permitting:** Environmental studies needed for pipeline corridor. Discharge & recharge permits; Potential algae/aesthetic concerns in Santa Fe River.

Inf — **Infrastructure:** 3 pump stations, 13.7-mile pipeline, and recovery wells.

Trt — **Treatment:** Advanced treatment adds cost and operational challenges.

Pub — **Public:** Continuous Living River flows may become expected or required.

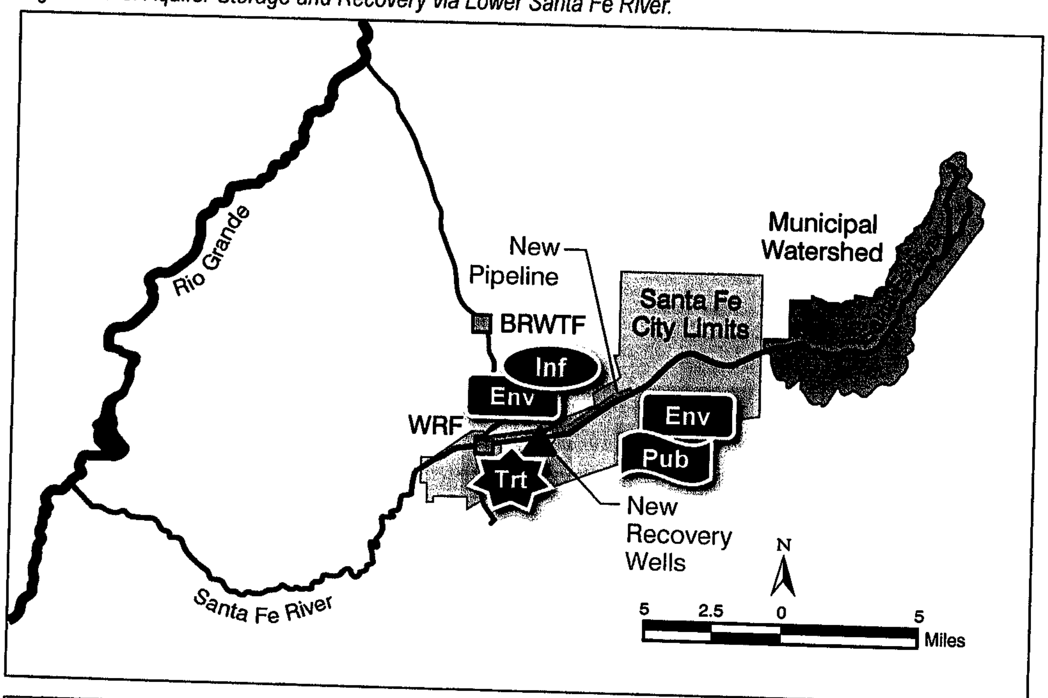
Alternative 4: Aquifer Storage and Recovery via Lower Santa Fe River

This alternative involves additional treatment of up to 3 mgd of reclaimed water for conveyance and discharge to the Lower Santa Fe River near Siler Road for recharge of the local aquifer. Although this alternative is similar to Alternative 3 in many ways, Alternative 4 would not supplement Living River flows in the downtown Santa Fe area. Water recharged to the aquifer would be withdrawn through new recovery wells in the Lower Santa Fe River and pumped into the potable water distribution system.

As an alternative, percolation basins could be constructed adjacent to the Lower Santa Fe River for aquifer recharge. Aquifer recharge and recovery using purified recycled water through percolation basins is practiced in several communities in Arizona, California, and elsewhere.

Reclaimed water would be pumped to a point near Siler Road and discharged to the Santa Fe River to augment streamflow and recharge groundwater in Alternative 4.

Figure ES-5: Aquifer Storage and Recovery via Lower Santa Fe River.



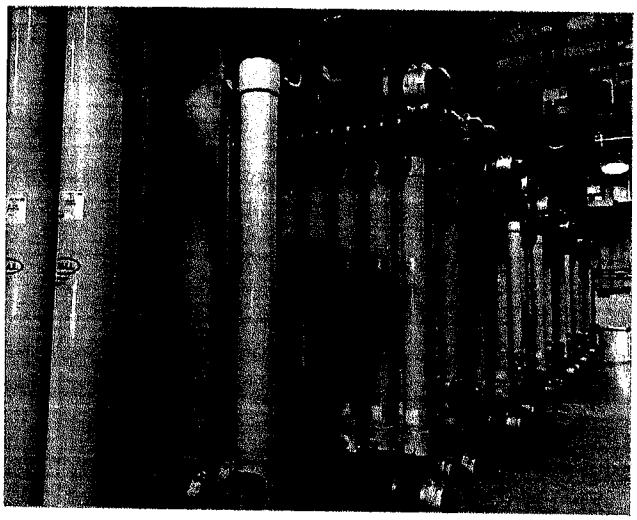
LEGEND

Env	**Environment/ Permitting:**	Environmental studies needed for pipeline corridor. Discharge and recharge permits; Potential algae/aesthetic concerns in Santa Fe River.
Inf	**Infrastructure:**	Pump station, 6.3-mile pipeline, and recovery wells.
Trt	**Treatment:**	Advanced treatment adds cost and operational challenges.
Pub	**Public:**	Continuous Living River flows may become expected or required.

Alternative 7: Direct Potable Reuse

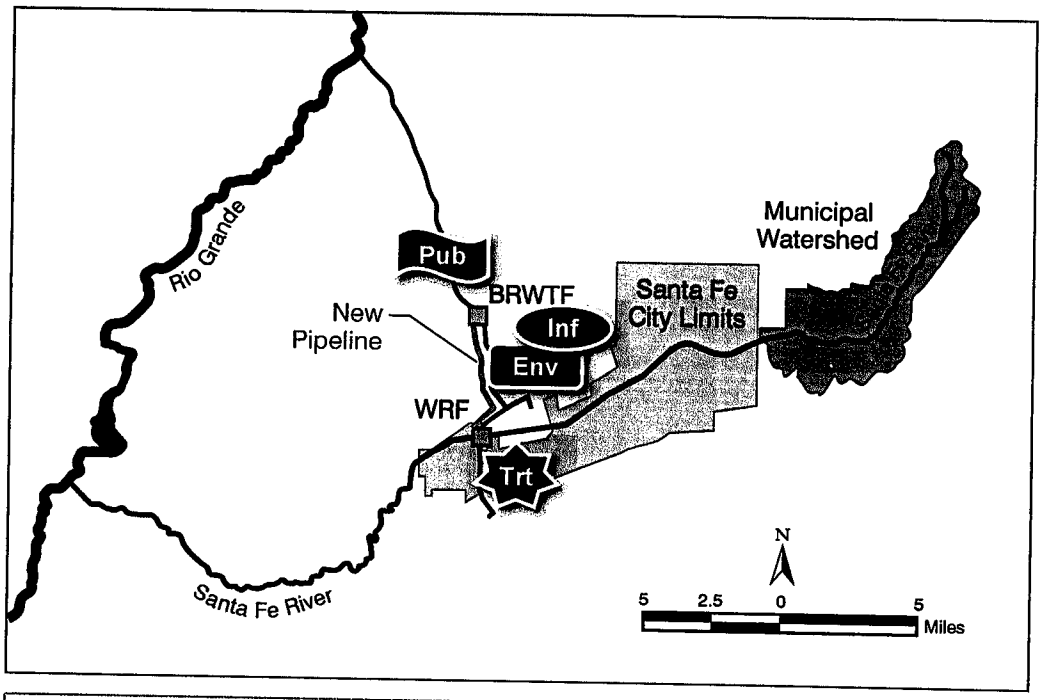
This alternative involves advanced purification of the reclaimed water from the Paseo Real WRF, which is then conveyed northward to the Buckman Regional Water Treatment Facility (BRWTF), where is it blended with raw water diverted from the Rio Grande via the BDD diversion, and the blended water is treated at the BRWTF.

The Colorado River Municipal Water District in Big Spring, Texas operates the only direct potable reuse (DPR) system currently in operation in the United States. The Village of Cloudcroft, New Mexico is also implementing a DPR system, and has worked extensively with the New Mexico Environment Department (NMED) to gain regulatory approvals. Several other DPR systems are either under construction or in various phases of planning in the United States.



Reclaimed water from a new Advanced Water Treatment Facility would be blended with Rio Grande water and treated at the BRWTF (shown here) under Alternative 7.

Figure ES-6: Direct Potable Reuse.



LEGEND

Env — **Environment/ Permitting:** Environmental studies needed for pipeline corridor.

Inf — **Infrastructure:** Pump station, 6.1-mile pipeline.

Trt — **Treatment:** Advanced treatment adds cost and operational challenges.

Pub — **Public:** Perceptions of DPR safety and water quality.

Highest-Ranked Alternative: Full Consumption of SJCP Water via Rio Grande Return Flow Credits

Tables ES-1 and ES-2 provide a comparison of the four alternatives. A comparison of these water reuse alternatives to the "non-Title XVI" alternative, which would not expand water reuse in Santa Fe but instead use additional purchases of native Rio Grande rights for diversion and treatment through the BDD system, concluded that the water reuse alternatives are preferable in terms of economics and the negative implications of additional native Rio Grande water rights purchases and diversions.

The highest-ranked alternative, Full Consumption of SJCP Water via Rio Grande Return Flow Credits, best satisfies the evaluation criteria used to compare the alternatives in detail. From a water exchange perspective, this alternative could increase the amount of consumable water that could be pulled from the BDD diversion by as much as 150 percent, for an overall multiplier of 2.5 times the original consumable water right.

Furthermore, there may be an opportunity to reduce treatment investments and operating costs at the Paseo Real WRF if discharge permit requirements are less stringent for the portion of the flow discharged to the Rio Grande.

This alternative also offers unique flexibility for future adaptation. The Return Flow Credit pipeline would convey water along a route from the Paseo Real to the Rio Grande that passes immediately by the BRWTF. Should demands or water management conditions change in the future, this pipeline could easily be adapted to convey reclaimed water to the BRWTF for treatment as part of a Direct Potable Reuse system. Additional treatment may be warranted in this scenario, as described for Alternative 7 (Direct Potable Reuse).

The actual water supply benefit of the Full Consumption of SJCP Water via Rio Grande Return Flow Credits project would be limited by physical water supply availability at the Paseo Real WRF. Existing commitments to non-potable reuse and minimum target releases to the Santa Fe River from the Paseo Real constrain the supply available for return flow credits at 2,334 AFY under the scenarios contemplated in this Feasibility Study. Increasing the capacity of the return flow credit pipeline for increased wintertime use and implementing additional conservation measures at non-potable reuse sites could increase the amount of water available for exchange under this alternative.

Precedent for this Return Flow Credits approach has been established in New Mexico by the Albuquerque Bernalillo County Water Utility Authority, serving as a full-scale "proof of concept" in terms of both the technical and permitting aspects of such an exchange. The Authority is thereby fully diverting and utilizing its SJCP water. Similarly, this approach would allow Santa Fe to make full consumptive use of its imported water supplies, while potentially avoiding Rio Grande Compact and Rio Grande Environmental Impact Study concerns.

The Santa Fe Water Reuse Feasibility Study determined that this alternative is the highest-ranked water reuse approach, considering that it offers the lowest cost, provides the greatest water supply benefit through drought-resistant recycled water supplies, requires no additional treatment requirements, and leverages Santa Fe's existing investments and available capacity in the BDD diversion, conveyance, and treatment systems.

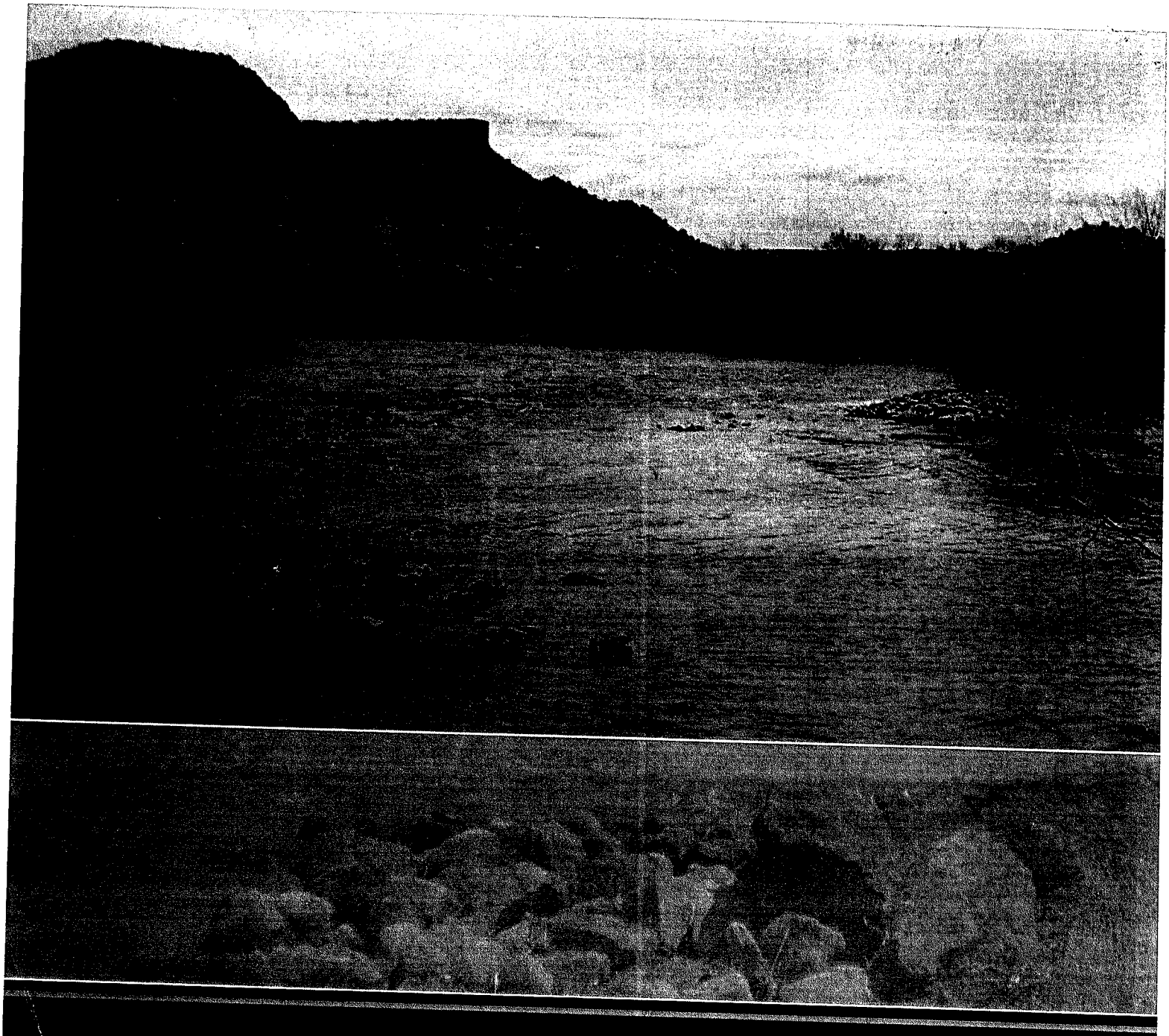
Implementation steps recommended from this Feasibility Study include confirming that this alternative best meets the community's needs through further public outreach, followed by preliminary design, permitting, and project funding analyses to support implementation of the required infrastructure.

Table ES-1: Costs and Supply Benefits of Highest-Ranked Alternatives.

Consideration	Alternative 2: Full Consumption of SJCP Water via Rio Grande Return Flow Credits	Alternative 3: Enhanced Living River and Aquifer Storage and Recovery	Alternative 4: Aquifer Storage and Recovery via Lower Santa Fe River	Alternative 7: Direct Potable Reuse
Capital Cost	**Best Alternative** $17.8M (2016 $)	2.7 X Cost of Alternative 2	1.7 X Cost of Alternative 2	2.1 X Cost of Alternative 2
Operations and Maintenance Cost	**Best Alternative** $0.3M/year (2016 $)	3.9 X Cost of Alternative 2	2.4 X Cost of Alternative 2	2.8 X Cost of Alternative 2
Reduction in Future Water Shortages	**Best Alternative** 2,300 AFY	37% Less than Alternative 2	44% Less than Alternative 2	Similar to Alternative 2

Table ES-2: Considerations for Highest-Ranked Alternatives.

Consideration	Alternative 2: Full Consumption of SJCP Water via Rio Grande Return Flow Credits	Alternative 3: Enhanced Living River and Aquifer Storage and Recovery	Alternative 4: Aquifer Storage and Recovery via Lower Santa Fe River	Alternative 7: Direct Potable Reuse
Infrastructure (Inf)	Requires 1 pump station and a 17.7-mile pipeline	Requires 3 pump stations and a 13.7-mile pipeline	Requires 1 pump station and a 6.3-mile pipeline	Requires 1 pump station and a 6.1-mile pipeline
Environmental/ Permitting (Env)	Requires environmental studies for pipeline construction	Requires environmental studies for pipeline construction	Requires environmental studies for pipeline construction	Requires environmental studies for pipeline construction
	Requires NPDES for Rio Grande discharge	Requires NPDES permit for Santa Fe River discharge and permit for discharge credits in new well field	Requires NPDES permit for Santa Fe River discharge and permit for discharge credits in new well field	Requires permitting for potable water reuse
		Potentially requires supplemental permitting for potable water reuse	Potentially requires supplemental permitting for potable water reuse	
Treatment (Trt)	No additional treatment required	Advanced treatment required	Advanced treatment required	Advanced treatment required
Public (Pub)	Reduced Santa Fe River flow below Paseo Real WRF	Reduced Santa Fe River flow below Paseo Real WRF	Reduced Santa Fe River flow below Paseo Real WRF	Reduced Santa Fe River flow below Paseo Real WRF
		Sustained water to the Upper Santa Fe River may dictate long term obligations	Sustained water to the Lower Santa Fe River may dictate long term obligations	Potential perceptions of safety and water quality of direct potable reuse
		Low level nutrients may increase algae in Santa Fe River	Low level nutrients may increase algae in Santa Fe River	



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