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SUMMARY KEYWORDS

water, nitrate, wells, tribe, system, add, project, aquifer, alternative, moving, rehabilitation, patrick, cost, treatment, run, area, funded, questions, land, mentioned



00:03

The design time basically at the gas station.



00:10

There's probably



00:13

only three officers who wore



00:23

a fabric.



00:32

Hey, Patrick.



00:36

Hey, look, he looks froze. He looks like a statue. Yeah, thank you. Yes, bro. Here we go. I'm you, Patrick, you.



00:58

Apologies about that I'm a Skype person particularly It's first time I've used Google meets



01:04

yet. No worries. We were starting to get used to three or four different ones that we've kind of used. mean I say this at one for everybody. But yeah, challenges I guess. Yeah, definitely.



01:20

Are you doing Patrick?



01:22

Good, good. Slow stormy down here in Lawrence. I don't know if it's the same up there.



01:31

The winds been blowing pretty heavy and you know, cooled off dramatically. Really? It was. I bet it was probably a 20 degree, if not more, please existence, just to draw.



01:54

Hello, Mr. FOSS?



02:00

got here.



02:02

First time, I think we're been mature.



02:08

I have different kinds of clothes. I just don't learn much.



02:13

Today, last time,



02:15

I just got done. I just three minutes. 53 seconds ago got off another phone call with the legislator trying to figure out, you know, some of the things are happening and everything I have to give. You have to get testimony again next Wednesday, early in the morning. So I have to go over Tuesday night and get ready for nine o'clock. 45 minute testimony to keep things moving. So it's crazy.



02:40

Yeah. I know. You're welcome. Hi. Hey, Patrick, you're gonna screen share your presentation today. Correct? Yeah, I will be. Okay, no problem. I just want to make sure that if I didn't set up for you, I



03:06

think I should be able to figure it out and have it loaded up on my computer now.



03:14

It's pretty easy to set the present now button on the bottom of your screen, and then to choose the tab that you want to present.



03:21

Pretty simple. Excellent. Excellent.



03:24

Patrick, I know you haven't been officially introduced to David but David Tam is our economic development coordinator. So he's helping us out and all of our efforts and

economic development so he's been with us for Actually, it's been hopefully a couple years now. So yeah, he's he's here with us tonight helping us achieve all of our goals and while is actually with Oh, ah he's been how long you've been up here Pat.



03:59

I've been up here since late 2016. So going on five years now full time March 2017.



04:08

I got a little bit of a water background as well but more on the walkways energy background always interesting stuff in order to have purple water so this is going to be a great session to learn.



04:22

Excellent now



04:25

and then lie all your you've actually was here for a few years and then you had left and then now you're back. Correct? Yeah, that's right. I used to have a pap position whenever it was four years ago now in times five. And then yeah, I'm back and I'm more on the utility side of things now to to work for like longer term development type project. Nice. Well, we're gonna get humans to join because if you don't start you know, as our seven bye bye About the police are so good. They're



05:06

excellent.



05:19

Cameras while they were working. While you're here, we won't come back. You can actually do the poisonings in one. Oh, that's just a lie on. About three more minutes. There's been a couple people join in here. We always try to give a few extra minutes for the ones that are having some troubles. But there's another number I see on here. It ends

with one zero. It's a landline or cell phone. Can you announce yourself, tell us who you are?



06:38

need to take yourself off mute and announce yourself because this is for tribal members only.



06:45

Hey, go.



06:45

Hi. Hi, this is crystal Keyes with the Bureau of Indian Affairs and I've seen it on Facebook and since I am the CEO for the project, I thought I might look



06:56

perfect. Okay. Well hello crystal. How are you?



07:00

I'm doing good. How about you?



07:02

Pretty good. That's




07:03


not what I was expecting.





07:06


Oh, I'm sorry. No, no, no


 07:08
worries. No,


 07:09
it's good. You surprise me I wasn't expecting you guys to be on this evening. We are talking about you know our water infrastructure and public water system for the tribe. So you're more than welcome to stay on and


 07:29
if you prefer that I logged off it's perfectly fine. I just saw it and I was like, oh, maybe I missed something I need to find out about Yeah,

 07:36
no, no worries. You're welcome to stay on. Yes.

 07:41
Thank you.

 07:42
Yeah, definitely. I think everybody else we know So okay, we went over

 07:55
the

 08:00
names this one other faces Welcome to the assertions I suppose housing the housing

 08:44

one of my friends lives in North Lawrence and she says it should was pouring rain and thunder and lightning. Is that what you're experiencing?



08:52

Yeah, it's down now. All of a sudden it just just dropped a bunch of rain and lightning was happening but it's since settled down. That's good.



09:03

Hopefully. Hopefully it'll head up this one when he gets more gets water on the ground.



09:08

Yeah.



09:10

I know it's March since I'm always keeping an extra clothes on the leather mat. Now just just in case. Alright guys, let's do it. Oh,



09:41

five. Welcome to st I'm St.



09:55

Hey.



09:58

Alright guys, so Thank you very much for the call today a little different format for me, as you see, I'm actually in a conference room here in Kansas instead of the West Coast. So not really, you can see me on this side of the coin. Do you want to say, as a call moderator today, we'll be talking about our water system. And both will have to water here on the tried. Few few ground rules, please mute your phone if you're not presenting for the questions toward the end of the conversation. And then from this point, I'm going to

introduce Chairman, Tim rod to make a few words and introductions and we'll go from there. So look forward to a great presentation to learn about water, how critical is the community and Thanks, David. So yes, thanks, everyone, for joining this evening. We've had a number of questions throughout the last several years, you know, on the status of the public water system owned and operated here by the tribe. So we do have a couple of guests with us tonight. They're from Oh, eh, which is Office of Environmental Health, which is a entity off of Indian Health Service. And with us tonight is Patrick Fox. And then we also have Lyle, Stefan, and Lyle, and Patrick, if you guys want to go ahead and give a quick background on yourself and introduction, so everybody knows who you are, and kind of what you do.



11:30

Certainly, I'll go first, my name is Patrick Fox, I'm a field engineer in the Holton osdh. Office. And so our office serves the tribes in northeast Kansas with regards to their water and sewer infrastructure, as well as we help out Native American homeowners with their own water and sewer systems. So some of you may, some of y'all may have worked, or office in the past on on a septic tank or something similar, but we help out with the providing, or designing and providing infrastructure and funding for projects as well as with technical assistance or assistance in operating the water and sewer systems.



12:16

Man while you want to go ahead and introduce yourself. Yeah, so my name is Laos, that when I similar to Lieutenant Commander, Fox, similar to Pat, I worked in the Indian Health Service for my career. I've had about nine years field engineer experience. And for the last four, I've been doing this utility consulting more on the operations and maintenance side of the house at this point. I'm out of Oklahoma City. And yeah, I've been working with Pat on just kind of looking at the different options to for the nitrates in the wells, and we'll get into that from here. Yeah, thank you. Well, Tony, if you want to go ahead and go ahead and obtain the information that you're needing.



13:10

I can do that. I think everybody on here has heard it before, but just wanted to spread the word to get some addresses, emails, phone numbers, and everything updated for the enrollment system.



13:23

Everybody wants to pass that along and either send it to myself or three napkins at the tribe logs.



13:35

We also have committee members on Lance, if you want to go ahead and introduce yourself and then we can just go on down the line from here.



13:46

Sure, where the get my buddy gets to could unmute myself. Yeah, I'm I'm Lance Foster. And I've been functioning as a kind of point of contact for some of the water projects, including the water tower, and trying to get that along. I'm still their tribal Historic Preservation officer. My areas specifically mostly environmental, cultural, that kind of thing. So that's who I am.



14:12

Thanks, Lance. Oh, me. Now I'm the Tony P. I'm the secretary of the executive committee. And please.



14:26

I mean, least tell you I'm the treasurer of the executive committee. I'm also the treble grant writer.




14:33


All right, thanks, committee members. And and I do want to mention Robbie Craig is currently the member. He was not able to join us tonight, but he may join here shortly. So with all that being said, we'll go ahead and call upon Patrick. And we'll go ahead and get started with the presentation. Patrick, if you want to go ahead and share your screen.





14:52


All right, we'll get started doing that. Now.


 15:07
Okay,

 15:10
here we go.

 15:14
Let's get the presentation started. First off, I just like to thank everyone for having me here to speak with you this evening. My and myself and Lyle. And so basically we're going to talk about is a little bit about the water system for the Iowa tribe in general, as well as particularly one issue of note, which is the nitrate issues with the wells. And if you have any questions, I'll have time at the end. And also, I'll have some contact information at the end as well. If you think of something you may want to ask me in the coming days or so. And so just a little bit of background on the water system, the tribe operates and groundwater system, you can see a layout here. Basically, they use two wells and the wealth fields down here next to the casino. And then there's a an existing standpipe and there's also a new water tower being constructed just a bit to the east over here. So

 16:25
I'm only seeing your cover page. I don't know if everybody else has seen anything differently. But all I'm saying this the the title page.

 16:34
Yeah, you need to share the map, Patrick so people can see it.

 16:40
Okay, I'll try to check that out. I'm sharing this screen, but maybe,

 16:45
okay. We can see the map.



16:50

I must change slides. Is this work? Is it showing the wells right now?



16:59

Notice the distribution map overall, I think that now.



17:06

I might just not presented in the presentation view. I think we've learned the well.



17:11

There's the wells No,



17:13

yeah, when I go to presentation view the slideshow down here, it doesn't seem to work. So I'll just roll from the editing screen. Make this a little bigger. So to look at the wells a little more in detail, you can see there's two wells, there's the warehouse that houses the pumps and all the piping and controls as well as the chlorine treatment system. And then there's a northwell and a Southwell. In addition, there's a small test well, or observation well appear. And finally, an abandoned well, and all well, it's not used down near the South well. And so these wells are operated in a blended fashion, basically, both wells run at the same rate at the same time. And so that water is mixed, and then treated in the warehouse with chlorine for disinfection, and then delivered to the system from there. So the big issue with these wells is right now they're high in nitrates. And so nitrate is it's a naturally occurring compound, but it has adverse health impacts to folks if it's ingested. Basically, it's sort of it binds to hemoglobin very easily and sort of can displace oxygen. And so it's particularly for infants. It's, it's hazardous. And it's causes what's commonly called Blue Baby Syndrome, where those, you know, the infants don't have a whole lot of blood oxygen, they can turn, they can turn a little balloon turn. And so it's, it's a concern. And the EPA has set an MCL for nitrates, which is basically it's a maximum contaminant level, which is saying, you can have at most 10 milligrams per liter of nitrate in your water, it'll still be safe if you go higher than that than they expect health impacts. And so nitrates are actually kind of it's, it's a more and more common issue for wells throughout the Midwest. And so the last quarter four of 2020, the results were 9.15. And so they're pretty high and pretty close to that maximum level. And you can see, here's a little bit of a trend

over time. For those wells and it's monitoring the system, we make sure it doesn't exceed it. But basically, it seems that it's slightly lower in the winter, slightly higher in the summer. And during periods of drought. It's actually To the higher as well as sort of a trend that's been noticed. But generally, they've been slowly trending upwards. But what's peculiar about the, the tribes system in general is that that northwell, if we go back real quick, you see these wells are only about 50 feet apart. And they're drilled to the same depth, they encountered the same geologic formations. But the northwell has about seven milligrams per liter. So the northwell is safe to drink from. But the Southwell is the one that's too high nitrate. And so blended together, they come out about nine, and so they're under the FCL. But it's kind of a peculiar situation. And so recognizing this recognizing this potential health impact, and this issue, the IHS planning project was funded with EPA funds to look at different alternate well sources or water sources, including drilling new test wells. And so that's really what we're going to be talking about tonight, or only presenting on tonight, is this planning project that we've been undergoing. In addition to that, there were some other actions taken by IHS to sort of address this issue. We inspected those wells to check for surface contamination. Because nitrates



21:25

it can enter wells through surface contamination, that's one basically avenue of getting down there. Typically, it's not super present offers. So we checked that a little bit a couple methods to see if that was the case, we also abandoned that or properly closed that abandoned Well, that wasn't used, it was very close to the southwest. And so that was also a potential contamination concern. So that was basically filled in with bentonite, which is tough clay and then kept. And then in addition to this planning project, there's a separate project I just project going on right now, to provide the tribe with a backup connection to Broward County Water District, district number two, and public water wholesale district number 27. And so that projects basically going to provide an emergency source so that if these wells get too high, they can just switch over to that. And that connections allocated for one to two months of water usage, depending on how much water is used. In addition, we actually, as part of this planning project, just ran the system off of just the goodwill to see like, hey, if, you know, worst comes to worst, and you just have to run out to Goodwill with the system work, then the system is that the system will run off of the one goodwill of northwell. We checked it for a period of two weeks and made sure to keep a good close eye on those nitrates during that test period and found that the nitrates didn't actually change for the northwell. And so it seems like it has a good amount of time that it could provide water to the system. But that's kind of a lot of stress to put on one, one well pump. And so these projects were undertaken to basically find another good source of water. And so this planning project looked at several different alternatives to provide water

system, the first of which is basically a new well. And so as part of that, we drilled three test wells one down near the existing wellhouse, one up here by the existing standpipe and then one over here by where the new water towers being constructed. And so these two Unfortunately, the Test Flow by the existing standpipe and the Test Flow by the new water tower, those were dry holes, basically, we drilled down deep and only found shale there, there's no water there. But for these tests there for the test well down near the existing wheelhouse we found a good source of water and a good yield. And so looking at that in a little more detail, basically drilled six inch test Well, we found a good yield. And it was drilled about right here. And even though it's closer to these other wells that have higher nitrate levels, you can see that we tested the water after pumping it for 24 hours straight, and the nitrate was only 2.7 milligrams per liter. And interestingly, that is also the level that was found. We have the original records from when these wells were drilled, and that's actually it was 2.7 as well. So it seems like that's the background concentration of the aquifer. But so it's interesting again, it's sort of peculiar why these are so high but this Well presented as a good source of water. And so if we were to connect it into the system, basically, this is what it would look like we would add some piping, we would complete the well put a concrete slab and pumped down in there, add some piping to bring it to the well house where we would reconfigure the piping in there, and then redo the controls so that the the new well and the goodwill would be the ones that are used in the south, well, that's too high and nitrate will be taken offline and potentially just held in case of emergencies or as a source of non potable water.



25:37

And so, looking at that alternative, the new well, alternative and one more detail in regards to cost, we estimate that that would cost about \$58,000 to construct it and capital cost. And then moving forward at would have a recurring operation and maintenance cost of fat nearly \$5,300 a year. Now, every alternative has risks. And the risks associated with this alternative is we found low nitrates when we drilled that test well. But who's to say that those are sticking around in the future. Now they could rise slowly, if that will last another 40 years, like the existing wells, those those were drilled about 1984. If it lasts about that time, they'd be great. It's a good long time. But maybe it's a little it doesn't last as long as that. So that's a risk associated with that alternative, which we have to keep in mind as we look at the different options. And so the next alternative we looked at was to basically add a treatment process where we would remove the nitrate from the water flows existing wells. And that would basically entail adding an ion exchange system to treat that water, which is pretty similar, like a fancier version of like your household water softener. Basically, some big filters would be added that are folded for this resin that nitrate bonds to and so that way it would remove the nitrates in the water. But it also it sort of pulls out a lot of the minerals and hardness of the

water too. So really, we would only treat about 60% of that water. And then mix it with the other 40% so that the nitrate levels are knocked down to good and safe levels, but you still have some of that hardness and minerals in that water. And so this is a layout of what that would look like. Basically, first off, that alternative would include pilot testing of the nitrate removal, which is basically a vendor who would take their equipment out there and treat the water for a period of time to basically prove that this process works like oh, it's treated this water for two weeks, and it's been working great and then run a lot of tests on to make sure it does indeed, remove that nitrate and not remove anything else or impacts the water chemistry in an adverse way. So once that's all been proven, and this process is working, a new treatment building would be constructed, which would house the treatment, technology, the filters and the controls. And so those filters basically, periodically, as they fill up with nitrate, they have to be regenerated in backwashed. And so that adds a bit of wastewater to the system. So as part of this, a wastewater evaporation pond would be constructed sort of south of the well. And I have to apologize, my cat, if you can hear that evaporation pond would be lined to ensure that it would be thoroughly lined but none of that wastewater seeps down into the ground from there. And this is looking at the costs of that nitrate removal alternative and little more detail. You can see it's it's pretty expensive. We estimate the capital costs about 634,000. And the recurring Inm costs anywhere from 23,600 to 47,000. And so that would be an additional cost just to run the system per year. And that is such a large range. Because adding this system, it's basically it's it's complicated treatment, you'd have to have it adds labor hours to running that system, you have to test the water, you have to maintain all the different treatment that's included in that new building. And so depending on how much time that takes to run as well as you might need a full time operator basically just to run that system. And so there's a lot of uncertainty in that which is why that cost is presented as a range. So best case scenario is something you can add on Someone local will continue to operate the system as part of their added duties. And just as a couple, you know, maybe 10 hours a week, worst case scenario, you might have to hire another full time operator. And that person may have to come from outside of the community, maybe they have to come in from fall city or something and basically be paid just to operate that system, which would be quite a cost. And so that's why there's such a large range, and that O and M cost. In addition to



30:33

that cost, there's some risks of that alternative. And that includes that evaporation pond, basically, the way it's sized. Now, I'm gonna jump back there real quick. The way this is sized now, with the basically all the available land in the south of that wellfield, it could treat 1% of what that system would produce. So 1% would be wastewater, that's the most it could treat. Now typically, those systems how much wastewater they produce ranges

from point 5% to 2%. So it could work out, depending on the type of treatment that was used. However, it's it's kind of cutting it close. And so say if there was if the system treated or produce more than 1% wastewater, that you might have to use a pumping system basically pump that wastewater away, at somewhere else to be disposed of, and that would add quite a bit of cost and omm to this alternative, likewise, if there's, say, a really wet year, because those ponds basically operate on our preparation, and if there's a really wet year, you could basically have to have some sort of emergency emergency disposal options to take care of it. And that can be quite expensive. And finally, there is treatment. Right now the system is operator level one. And that's probably what, that's what the EPA expects an operator to be certified at, like how much or what what their license what they can treat a level one system basically. But adding this nitrate removal adds some complexity to the system. So there's a small chance that they may require that the operator be certified at a level two, which could add cost as well as complexity and administrative burden to the system. So the next alternative, this would be basically purchase monitor full time. And



32:37

as I mentioned,



32:38

with that emergency connection profit earlier, this is sort of what it looks like. This will be the the watermain, they'll be constructed here as part of that ongoing project. Now this is funded, and it's going to be moving forward. But basically, you can take that emergency connection and turn it into a full time connection,



32:57

it would require adding



32:58

a booster station that's located up here for planning purposes. Because emergency connections, one thing if you just need to use it every now and then. But for full time service, you would need a booster station to basically pump that water up to fill that new water tower and make sure that the pressures are good for the whole system all the time. and boost your station or booster station, we're also have chemical or chlorine included in

there as well to bump up that chlorine level. Finally, that if you were to go full time with that connection, you'd have to basically pay more allocations fee to public wholesale water supply district number 27. And that's basically they're down in pattern. And they are a groundwater system, they sell water to a lot of systems in the area. And that's who you'd be, or the tribe would be purchasing water from. And so you have to basically pay them an allocation for you saying, Hey, we're going to buy this much water. You can't sell that to anyone else. And so that would be required for the alternative as well. And so looking at that in a little more detail, you can see that the capital cost is about 370,000 with a recurring O and M cost of about 19,600. And a big chunk of that capital cost is the additional allocation fee. And I need to verify that with the district. But that's estimated based on what the tribe will be paying for that emergency connection now. And a big portion of this O and M cost is purchasing the water. And so some of the risks associated with this project is basically being sure that public wholesale number 27 has that spare capacity because one to two months of water use for the systems about 1.4 million gallons a year. And that's that's already been agreed to, to be allocated the tribe. But bumping that up to full time use would basically move it up to 10 million gallons. And so discussion with the district and agreements would then need to be made to ensure that they have that spare capacity. Also, that purchase water rate from the district, it might increase over time, if they have to implement their own nitrate treatment, they have higher nitrate levels as well, they have four groundwater wells now. And they their nitrate levels, last time I spoke to them was around six and seven. So not nearly they're not as high as the tribes. But in the future, those could increase which would increase the purchase water rate. And so next alternative is, or the last alternative we looked at is, is basically rehabilitating those wells. And so as I mentioned before, these the difference in nitrates between these wells, it's it's peculiar, as I mentioned, and we can't guarantee I can't tell you the one 100% certainty what's causing this elevation in nitrate. I mean, we found that the background levels now prefer low, the two wells are close together, but they're very different nitrate level. And so we've been looking at the potential for perhaps that a, what's called an ammonia oxidizing biofilm is causing this increase in nitrate. And basically, a biofilm is just a collection of bacteria that have sort of grown together in sort of a filmy layer. And ammonia oxidizing would mean that they would take ammonia that's present in the groundwater, and they oxidize it to nitrate. And so those that biofilm could be present in the crack that's around the bottom of the well, as well as in the nearby aquifer, and that they've just sort of fed on that ammonia over time, which is causing this increase in nitrate. And so we've been looking at doing some testing with some specialty firms to see if this is the cause of that elevated nitrate. And we're actually moving forward with EPA on you project, we to actually do that here moving forward. It's not gonna be exactly in this project, it's a little bit outside of the scope, we have a project to do that moving forward here shortly. And so basically, these firms that do a lot of testing down there are on the water, and look at different parameters. And they can say, Well, you know, this, it seems to

be it's from this biofilm, it could be rehabilitated, basically, these existing wells. And so that rehabilitation were basically consist of chemical treatment, which is just really shocking with chlorine, as well as some slight acidification. And then also some physical agitation, maybe some, some water jetting of the screens that are in the bottom of the well to sort of clear out and you know, get rid of that biofilm that could be causing this nitrate increase. And so that's something we're pursuing the we're estimating the cost of that study to be about \$10,000, and the actual rehabilitation to be about \$20,000 per well. And we're moving forward with planning on that. And then moving forward, we also estimate another \$4,300 per



38:35

year.



38:36

And so little more details about that, well, rehabilitation, these are the estimated costs now. And like I mentioned, we're moving forward with EPA, I'm gonna project to do that. But there's some risk associated with that as well, and that we could undergo this steady do all these tests. And finally, like, Oh, no, it's, it turns out it wasn't biofilm, like the test results don't seem to indicate that. So rehabilitation may not be an option. Or say it's good to go again, pretty sure it is a biofilm. Let's go ahead with this treatment. And it works. It's conducive, maybe those effects don't last. And so those are some of the risks associated with this alternative as well. And so, basically, with this planning project, we considered all those different options for getting some good water. And at the end, we sort of line them up and compare them and that's what this slide shows here. And so we look at the capital cost, and the reoccurring O and M costs, and then we sort of plugged that into the the estimated expense of running the water system. And basically this is based off the 2018 figures but you can see your ranges here with the nitrate removal being the most expensive and rehab and new, a new one alternative people lowest. We also assuming Well, we go ahead with one of these options. And it costs this much how we considered how much it would cost increase rates for the customers to basically cover all that new cost. To be fair, we, we've, I just actually recommends that the water rates for the system be a little higher than what tribal members are currently paying,



40:31

just to



40:32

pay for the system and 100%. Right now, the tribe subsidizes some of that cost of operating the water system. But you can see in this right column that with the added expenses of one of these options, that's sort of what we estimated it'll cost folks on their monthly water bill. So in addition to just the cost of these alternatives, there's also other considerations such as Oh, NM, how hard or complex it is to run these new systems. The new well, alternative, that's, you know, the the water department has been running their existing wells for a long time there, they tried and true with that they know what they're doing. So I wouldn't be too bad. Well, rehabilitation would be a little bit more complicated, you have to have a specialty firm do that. And there might be some added treatment moving forward, nitrate removal would be the most difficult because it is basically adding a whole new treatment system. And so it would be more complex. There's also things such as the administrative burden, how, because, you know, all these options require reporting and different paperwork and things. So that's something to consider as well. And then also, the relative risks is this alternative going to work, basically. And something also something of note is when we looked at what we call non revenue water for the system, that's basically water that's not being paid for. And that's, that's a large part of its leaks. But also it can be, you know, flushing, fire hydrant to get the system, get some new water move in or scour out some of the pipes. So that non revenue water, when we did a quick water audit, it was around 40%. So it's a good amount. So that could be some low hanging fruit to reduce some of these expenses. So that's something we just wanted to bring up. I know, the pressures are pretty high and the western end in the northern ends of the system. And with that new water tower project, there's going to be some valves installed that should help that. So that might help the leakage issue. But that's that's something to keep in mind as well. And so basically, we looked at all these and I just his recommendation is that the the new well, alternative be pursued, as well as the railroad rehabilitation study, just to see if that is a viable option. And basically, because the new Well, it's it's sort of a, we know, that's good water, we know it's going to work. And then the well rehabilitation, you can sort of look at that as like, well, that's sort of a long term investment, maybe that new well has similar issues moving forward in the future. And so we recommend moving forward with those. And actually IHS with EPA funding, through sort of a quirk in their system already has a new well project funded. And so that's moving forward, I'm actually working to complete that test. Well, I've mentioned



43:46

up here.



43:49

And getting that connected, we were actually able to get that funded in that. We drilled that test while extra extra big and sturdy, basically, because we knew we had a good idea where to find good water. And so moving forward, that's basically what what HS is, is sort of doing is move forward, the new well moving forward with that emergency connection, and finally moving forward of the rehabilitation study. And so



44:20

can you go back to this one, I just want to make one more comment. You know, on the non revenue water, some of that could be down, down by the shop area, we have two ag apps that we do have some tribal members that come and get water from that and then also we the the fire department is not metered as well. And just for an example, our fire department has been out. I think they went out of 2am last night or this morning, and I think they finished up about nine but they went through 4000 gallons of water. So a lot of that could be utilized. You know the The usage there could be to the fire department as well. I just wanted to know.



45:05

Exactly, yeah. So non revenue, it's, it's, it's a, it's a big category to catches a lot of things and they may not be revenue, but like you said, the fire department, they're absolutely necessary. And so, but getting some that leakage down things that aren't necessary that that's, that's, that's good, that would be potential low hanging fruit. But thanks for noting that.



45:27

So we have



45:30

our house where they'll start logging those gallons. So you know, we can reflect that on, you know, the water that we're showing you. So that should should help.



45:42

Oh, excellent. Yeah,



45:44

the more information on water use really, really better for the system. So you can sort of target some of that stuff. And, and so optimize things moving forward. So with that being said, I'll open it up for questions. I'll stop sharing my screen, feel free to chime in or just put them in the chat. But before I do that, that's some my contact information. If you have any questions moving forward in the future, and if you don't jot this down, I have questions the future Feel free to to ask your executive committee, they have my contact info. So yeah, thank you all very much. I'll stop sharing



46:27

tactics before before we open up for questions. Vice Chair at Boston's deca top a lot water than any other experience in this area as well with a personal comments.



46:38

Um, well, I



46:39

mean, this is one aspect of our water situation, you know, we, we've looked at our water rights as well. And when tribes were established on reservations, wonders doctrine affirms that we have priority of water rights over other users on the reservation. That's something we need to always look at. The choices we make have an impact on the direction is going to happen for our descendants of future generations are going to get things more and more pollutants, and things that compromise our water, drinking our water that we drink and use in different ways. There's not going to go away, it's probably going to get worse. So it's something we have to keep in mind. It's not just always kicking the can down the road. But we have to address for the long term, what we see in terms of quality and quantity for our tribe.



47:33

Thanks, Crystal, my crystal, please might want to touch base on some of the water rights as well.



47:42

Yes. So he is right there as to winters right out there. So a lot of the water rights are not quantified. So it's a very vague area, if the water rights has not been established, that we do have reserved water rights in place. But then again, it's kind of very undefined in Oklahoma and Kansas area. So it's going to be a little bit more difficult. But you do want to keep that in mind that we do have reserved rights for preference for tribal members over non tribal Absolutely. Another thing I'm wanting to mention is that there were some feasibility studies mentioned in the IHS presentation, and I'm on the phone only I'm not watching the video. So I didn't actually get to see the presentation. I just heard about it. And some of those feasibility studies may fall under some of my bs funding, if that's something that the tribe is interested in. We cannot fund construction or any of the well stuff, but we can help fund some of those feasibility studies. So if you want to circle back with me on those, I can see what we can help out with on our end to try and get the ball rolling, if those are one of the alternative options that the tribe chooses to go with. I know there were a couple of mentions there. But yeah, this is very interesting. I'm



49:08

glad I'm on the call. And as crystal said, one of the issues where it's not there's not going to go away as quantification. There are kind of two ways that that goes along. And one of those is litigation, and the other is negotiation, and litigation can can take a long time. It's not really a preferred path forward, given that we're so interwoven with our neighboring community communities as well. So the best path forward at this point from recommendations from our water attorneys, such as Sarah Lawson, is to go the negotiation route. And the quicker we get quantification that includes not just aquifers, but it includes a surface water, such as the Missouri River we all know in our history with a Nema high river was moved away from our, as our boundary was established as our boundary and northern boundary. And that was in the early 1900s. That was moved away from us and was taken away from us, as well. So there aquifers are a difficult thing to predict. You know, we don't know, just as Patrick said, where those things are, you know, I don't know how good all of us are is water dowzers. But that's a, that's a situation that we don't know. But just remember, there are all these parts of this water. I mean, there's prices, there's the water clear cleaning the system, which, you know, it's just gonna get worse and worse, it infiltrates into the water table. And what's going on right now on the surface is going to be 50 years down the road down there in the water aquifer as well. Because like our soil, so it's just long term we get, we got to think about in a complex way.



50:52

Yes, thanks, Crystal, and Lance and crystal, that will be in your inbox here shortly, the presentation. So take a look at that. And if you want to circle back and maybe set a meeting up with the executive committee on a Wednesday, and we can invite Patrick and Lyle, as well. And we can kind of brainstorm on, you know, the funding that the Bureau has how Yeah, maybe



51:15

we could partner up on something to do with these one of these studies. I know we can do a lot of the data collection and the study funding, but not necessarily any of the infrastructure or any of the actual work. But hopefully we can build on that. So yeah, if you can shoot me an email I was that would be great.



51:35

All right. Sounds very good. You got EC members. Do you, Tony release? Do you guys want to comment? No. I don't have anything. Okay. Well, then we'll go ahead and open it up for a question and answer.



51:57

Please make sure that you unmute yourself before you ask your question. And feel free to raise your hand or add comments in chat issues with the fair. So I call it questions. thoughts around the presentation today are topical water.



52:21

Yep, this is Rebecca Jones. So my mind is my question kind of goes back to what Lance was talking about. I know that several years ago, Brownback had a brilliant idea to divert water from the Missouri River to eat to western Kansas, to supplement the Ogallala Aquifer. And I had never seen anything where there was any consultation with the tribe. I think that like the plan was to run it to south of our reservation there. But I wanted to know, if we have been apprised of what the status of that project or that plan is. And if we we have been consulted on it at this point, if it's going forward.



53:10

That's a good question, Rebecca. And yeah, we did battle that. myself. And Alan Kelly, at the time attended several of those water meetings. We did express our you know, we didn't, we didn't think that, you know, that was going to be a good project for this area, because they were going to you know, it's just going to be just south of whitecloud. You know, we have ancestral lands down there. And also, you know, to pump water from the Missouri River clear out to Southwest herself. Yeah, Southwest Kansas, you know, the evaporation rate, there was going to be a bunch of pumps that was gonna pop uphill, and then there's, this is the big project that really wasn't easy to happen. But we were a part of those. We did. We did express that, you know, we didn't support that project. But we've actually invited a lot of the water office and a lot of local farmers down to our reservation and we did a tour of you know, where the dam was going to be, you know, how much farm ground that was going to be affected and even people living in houses, you know, that land that they lived on was going to be just flooded. And you know, it's just you know, so it's, it's dead in the water, the last we heard, but we should probably check with the Kansas water office again, or Chris, how to find out if somebody is trying to ramp that up again. But as far as I know, Lance, Tony any lease, if you guys know but as far as I know, it's dead in the water until somebody tries to bring it up again. Yeah.



54:50

Like like Tim said, we had a tour with the legislators in the school bus. It was about three or four years ago and they saw this We would fled prime agricultural land for, you know, less than prime agricultural land so far away. It was basically a boondoggle a pipe dream. But there's always people that always have those. So we always have to keep on our toes, it is dead in the water. Currently, it is not possible as with a feasibility study was done, it's out of date. But we always have to keep our eye on and make sure that they're not going to try it again.



55:32

Thank you for that. Thank you for pushing back on that. I do think, you know, like, again, like Lance said, going forward, it's going to be watered, it's always going to be about it's always going to be about water. And we've we do need to protect our water rights and stand firm on that, that that we do have. I don't care if you know, it doesn't need to get quantified. What that is what our rights are there.



55:59

Yeah. I would agree with you, Rebecca. I think the you know, and I'm kind of speaking on for the committee that we're all in agreement. And this is a priority to get done. And it has been worked on and it is a lengthy process. But Christo, do you have anything to add to what I just said as far as the length of time and you know, how much time it could take, potentially, for us.



56:34

So that is a very gray area. You did explain the negotiation versus litigation. There are some litigations that have gone through quickly like the Choctaws and chickasaws. But that one had no federal expenditure, that litigation was purely for setting rules on when water can be withdrawn and certain timeframes with mating season of the fish and things like that there was no funds assigned to it. When you get into the some of those litigations that have funds assigned to them. And some of those, they get a little bit more lengthy, especially when there are other parties involved. Some of them can last upwards of 50 years, when you get some of those litigations, negotiation is a lot quicker. And as far as I know, you guys have not had a negotiation team assigned to Yes. So normally, when the tribe requests a negotiation team, they will either assign an assessment team to decide if the tribe is ready for negotiation. Or they will review the claims and then assign a negotiation team to start on that process. And I have not heard either an assessment or negotiations started yet. So once that process gets started, then the negotiations can start. And then you're probably looking in, I would say probably the 10 to 15 year range give or take for a negotiation, which can be much less than a litigation. But again, it really depends on what all parties are involved, what the issues are. And a lot of the attorney timeframes, because things can get pushed that so that they can work on other cases as well. And they can just get drawn out when more data is collected, maybe they need more information, that's going to be a two year study that can then push that further down the road. So giving exact timeframes is so difficult when it comes to water quantification. The needs for the particular case, can warrant more studies and more data collection and then it's just those are the best estimates I can give you is that it's very vague. And I hate that that's the answer. But that's really how it goes is it's a case by case basis.



59:01

One other thing we probably should mention, too, is that the nitrate situation other pollutants, you know, I mean, this is kind of the the environment we live in is an agricultural environment. And there's always going to be conflicts between what people

consider as an economic good versus health sometimes, then that's something that the tribe has to decide whole. And we don't we don't own all the property on our reservation. We we have water that runs through non tribal member property that affects tribal water quality, and not just here on the reservation, but upstream with for example, Tim might want to mention that we're assisting some folks in in trying to look at an operation that could really affect our water quality on rice Creek upstream that the second Fox notified us about as well. There are situations and it's one thing to do what you Want to do on your property, but when it goes on somebody else's property, then it becomes our problem. And that's what's happening.



1:00:09

The project that he's talking about is there's a landowner to the south of our resume south and back to the west, that is putting, he's actually applying for a permit to the state of Kansas to put up a, a poultry farm that would have like eight different production houses on this land, and that's where Lance have made the comment, when other ones, you know, other other landowners have neighbors or, you know, sometimes those pollutants come to us, that's what is going to happen in this operation, it will go downstream, it will contaminate our water that runs right through our reservation. So that is another project that we are in the process of trying to get stopped. And we're at the very beginning stages, we've got a comment letter that's been submitted to the state of Kansas. So we're just wait for that comment period to end and see what response they have for us. Oh, by the way, brought that up last, because that is a fairly large project that is going to affect the the I will try



1:01:29

the other questions.



1:01:32

Dr. Diane Duane, put a question. In our question. column, I guess she's saying I haven't heard anything about prevention, what are the major sources of the nitrates? And what if anything, can be done to prevent the rising levels?



1:01:59

I was gonna say, as far as sources, there's still there's studies trying to nail that down.

Exactly. I know, one of them is agricultural, use of nearby land, as Tim and Lance had mentioned, they're sort of just actually just sort of talking about that. And I know, there's been some efforts to sort of set aside that way. And Tim, you probably could expand on that just sort of set up side an area away from the well to basically prevent fertilizers and agricultural use



1:02:39

conservation easement, that we would negotiate with that landowner that owns that land that butts up to our wells, you know, that would, you know, entice him to not farm you know, so closely to those wells in those areas. You know, so that's part of it. Agriculture is probably in my mind, the biggest cause of it. And that's the anhydrous ammonia that we're putting on our land. And just so everybody knows that, the trivers made a big change. Last year, we do not use anymore anhydrous ammonia, and we switch to liquid nitrogen, which is going to help all this, you know, water quality, it's going to help, you know, the soil biology, and all the overall health of the tribal members here that live within this community. So agriculture be my, my, probably the top top highest would be the cause of all this. You know, we are trying to make changes to correct these problems. But no, Rebecca had brought up on the call last week about other producers in our area. So, you know, that's, that's another big concern. So, you know, we can make changes on our land. But we still have those producers that are still playing these different synthetics that is harmful to all of us. So we've got to find a way to entice those other farmers to look at some of these other practices that's going to benefit all of us so



1:04:20

and I think that there are some best practices that can mitigate some of these pollutants. You know, we see in the old days that there were larger buffer strips around along some of the long some of the streams for example, instead of you can see people just leave leaving almost like eyelashes along the eyelid, just trees lined up along that and then the eroded banks and the flows right into the into the stream. Now if you had a buffer strip of 50 feet or so on either side of that with vegetation, native vegetation, pollinators, trees, whatever. That's the struggle is like that would help mitigate some of the flow into the stream. At the same time, you have producers who see every row as either plus or minus in their financial column to. So how do you help mitigate that? What kind of benefits can you do because it for most people, it comes down to dollars and cents, and what makes them money in what keeps them from making money. That is the way our society runs, that is a difficult thing. But it's going to be a choice, because in the future, we're already seeing x. And more people that have, the more this happened, we're all going to end up being quite sick. I

don't know what really to have a great count, if you're spending it all on, on cancer or other kind of treatments.



1:05:47

There is. That's that's an excellent point. There is. In regards to other prevention, what we've seen a lot of times in individual wells, we'll see high nitrates in those as well. And typically, there's sometimes it's usually like a closest source of contamination, either from the surface getting down and running along that well, or if it stays too close to a septic tank, or toilet to drill wells pretty far from septic tanks and drain fields and things. And so that was something we checked as far as we did a quick die tracer study to see if there wasn't surface contamination getting into those wells. And so we did look at some prevention, I was kind of just hoping, I knew is unlikely. But when we closed that abandoned well, which was basically just an open hole in the ground, that goes right down to the aquifer, that producing layer is open, and we close that up properly put a cap on it, and maybe this problem solved. But that wasn't the case. And so we're looking at other sources as well. Like if there is ammonia from agricultural practices in that groundwater, maybe this study will look and identify that and say, those biofilms as I mentioned, using that ammonia, turn it right in nitrate. And so maybe some of this rehabilitation, as I mentioned my help in that regard.



1:07:11

And then sometimes there are environmental, biological services through wetlands, marshes, things like that, that, you know, filtrate, at least sediment, erosion, stuff like that, this carrying things into our aquifers. And, you know, the regenerative practices of grazing and things that we're doing should help mitigate on our land. But again, part of the problem is, is coming from places that's not our land, and we only have limited, say over those things.



1:07:49

Yeah, and I just want to back up to probably 2009 2010, when, you know, we get have a large issue that we had realized what was happening there, the pump house, so you guys would see more wells were at. And just off to the right hand side of those wells, there was a deep ditch. And, you know, what was happening was that when it rained, and the water trickles down to the ditch, it slowly eroded over and about 12 feet from those wells. So I believe, you know, that was the start of some of this could have been some of the problems. We did partner with the Corps of Engineers, oh, eh, IHS, EPA, there was a

number of federal agencies that we rallied up and and, and we were able to find the funding, and we did fix and address that issue. And then I would like to make another note just is out of the picture frame that Patrick had showed, just to the bottom there to the south of where the pump house is, there's a there's a pond there as well that this ditch runs into so we could have some surface water running off into that pond and possibly could be leaching. That's something else that I believe we need to look at and consider that as well. So, you know, those are some of the background from the very start of all of this was back in 2009. So we're constantly trying to find ways and funding to fix these issues for the long term health of the membership community here. So does anybody else have any other questions? Yeah,



1:09:40

yeah, it's just Brett



1:09:42

Raimi just wanted to add in add in a thought twos. I think it's kind of been noted that a lot of the solutions we saw were more about treating, treating the problem but not not really going upstream. so to speak, literally and metaphorically. I'm just sayin kind of coupling that it was seeing the costs associated with removal of nitrates. And just wondering At what point you know it, the investment that goes into that is better served in supporting wetland restoration. And some other things kind of similar to what the tribe was kind of working towards anyway with these different regenerative practices and in kind of following suit with that, and we'd love to see if it became kind of a normal kind of procedure standard practice where we're when we're talking about cleaning up nitrates, so in addition to know, looking at ways that we might remove them, we're also putting equal energy and funding into prevention via all the different things that Lance Tim have been talking about. And, and so what does it look like for even for the UBI, just from partners to, you know, to fund some of these efforts on the Iowa tribe lands, it's kind of like a, basically like a template or a trial run, practice run to actually see what the positive effects are of, you know, reclaiming wetland areas, as it relates to actual water quality, you know, nitrate removal, nitrate prevention, from even getting him in the watershed to begin with. And so maybe that could be kind of a collaboration between some of these entities that are either on the call or not, it's just like, you know, put some funds into letting us try it out, you know, let's, let's see, what what happens if we're able to, you know, work, even work with that landowner, give him financial incentive to, to stop, you know, putting nitrates into our well areas, you know, can EPA or other partners know, make it worth that guy's while to take some of that area out of production, and instead put in some wetlands

or at minimum buffer zones and, and then kind of serve kind of as an example, for regional, further regional options, instead of just nitrate removal alone. Because with leadership we have now there's already so much going that direction, it wouldn't take much to just give a little extra boost and support, you know, financially and, and otherwise, you know, just spreading the word to show that that we actually are thinking towards the future, not just for the immediate water supply, but everybody downstream as well. And we can really kind of follow, you know, people can kind of follow up and start following lead lead of tribes again, and taking care of lands and waters for everyone.



1:12:25

Point, go ahead, Lance.



1:12:28

There's just gonna be those, those are good words, Brett. And I think one of the things we're trying to integrate to now is our cultural ways and traditions as much as we can, in our practices and our thinking that will help us lead us back to a way to live on this land for a long period of time. And so I would like to add that this to our discussion, so ne ne means water in our language ni ny I nee okay. Like NEMA ha, okay? Ne Ne, our, if our means to be alive, something that's living is living, right? Eco, Adi means it is. and k is like a statement marker for if you want to your guy key if you're female. So are they K, what are the key means Water is life. Just want to add that to our discussion.



1:13:31

Like plants. This is while I almost kind of want to follow that thought that in I think everybody's talking on the same page here. Water Treatment, you know, if we have to to keep the water safe. You know, that's that's what we got to do. But just from a pure cost perspective, right? Like we're talking about and \$20 a month on a bill. But when it comes to treatment, when you have electrical, we worry about when you have chemical to worry about when you have if you have to heat that building, as we found out a couple of weeks ago, you got to hire an operator, you got to fix the pipes, you know, that that price for treating the water, you know, we're talking about \$20 a month, but I've definitely seen systems where for something pretty similar, we could be talking easily \$40 a month more on everybody's water bill. So nobody wants that nobody wants to have to pay to maintain one more widget. So you know, just just fall in that pot, just the pure cost of the treatment plant. That's if we have to, you know, I just will help fun with EPA and it'll get installed but, you know, and that's that's why we're looking at things like treating the wells. You know

what I mean? If it's possible that those nitrates are getting in to there, they're being created by, by basically bacteria in the wells, right? Air is 80%, nitrogen, 78%, nitrogen, something like that, it could be that the air that's getting into that well is being converted with the bacteria in that well, and so, you know, that's what that's the way we're going, we're approaching it now. But you know, we'll look at any which way to get get those nitrates out of the wells without treatment because again, nobody wants to pay 70 bucks a month for for water. I just wanted to add that, you know, there was one more thing I should mention, it wasn't mentioned at all this evening, but I do want to compliment the water operator, the water operator does a great job. And I've seen plenty of systems that weren't well maintained, and in the Iowa tribes as well maintain. So I just wanted to honestly just put that out there because it hadn't been mentioned. Thanks for bringing that up, you know, he brought some good points up there. And that's what we're looking at, you know, is if we do put this nitrate removal system in, you know, that is going to increase the costs on the user. And we are looking at, you know, the emergency hook up with down county as well. So we're looking at that rate structure as well. And that's what we're trying to do is, you know, take out all of the issues that we think that that are not going to cost a lot of money. You know, but like I said, if it if it, you know, we get through all of this, and we cannot, you know, get those out. And we have to have a removal system. That's that's what we're gonna have to do. But, you know, we are exhausting all of the other issues that we believe that could be causing these problems. And so you know, what I can't think lie on Patrick enough for all their hard work that they've done, as well throughout this whole time, about, you know, we wouldn't be able to get a lot of these projects done and completed. They do go after all of the Federal together to provide the funding to get these projects funded and, and corrected and implemented. So thank those those two individuals as well. We Ah, IHS and department Health and Human Services. And other than that, I don't think I have anything else if there's any other questions, David, who could take those and maybe in the call. We have a particular question if anyone has anything here. If not, we'll call the meeting. So last questions or comments.



1:17:48

Okay, well, I guess not. So, therefore the thing everybody doing next week, please share the fact that we're doing these calls, invite more people to join us. Thank you, our experts on the call today. Thank you Vice Chair last for comments regarding water as long as you guys all next week. Because I thank you.



1:18:09

Thank you.



1:18:10

Thank you, everyone.



1:18:11

Thank you