

PASCOAG UTILITY DISTRICT - BOARD OF UTILITY COMMISSIONERS

MINUTES

The regular meeting of the Pascoag Utility District Board of Utility Commissioners was held on Monday, May 18, 2015, at 6:00 p.m. in the District office, 253 Pascoag Main Street, Pascoag, RI.

Members Present: Chairman Albert Palmisciano, Commissioners Ann Polacek, Richard Jenks, Michael Kogut and Doug Lees

Members Absent:

Also in Attendance: Michael Kirkwood, General Manager; William Bernstein, General Counsel; Mr. Bob Ferrari-District Water Consultant

Chairman Palmisciano opened the meeting at 6:00 pm.

Minutes

- Pledge of Allegiance
- Public Comment

Mr. Frank Silva, Wallum Lake Rd Pascoag- Asked Mr. Ferrari for his background and what he has done for the District.

Mr. Ferrari- He has 39 years' experience and his career has been in water and waste water, water resource engineering treatment and distribution. He has worked with the District since 2011. He has worked on a facility improvement plan for District that looks at the next thirty years. He has worked on identifying new groundwater sources for the District. They've identified two areas and are doing preliminary testing in those areas. They've been working on the application for RIDEM for a new water source.

The firm he works for conducts business heavily in Massachusetts, Connecticut and Rhode Island as well as nationally. They've worked on corrosion control, lead and copper issues and microbiological contamination.

Bob's firm was hired to represent and work on behalf of the District's interests relative to the proposed power plant. In that role, it's a technical review and he advises the District and the only role he has is to protect the Utility District and the customer and rate payers of the District.

Mr. Frank Silva, Wallum Lake Rd Pascoag- Are you working on the infiltration gallery?

Mr. Ferrari - Yes, he's working on a new water supply source for potable water for the District. They have conducted a pumping test program and a ground water model. They just

completed a pilot infiltration gallery on the south bank of the Clear River at the end of the District's service area. They've completed that work and are working to submit an application with RIDEM later this week.

Mr. Kirkwood stated that Bob has been working on this for the District for years. There's also a second site in Gloucester that they've been working on as well. In addition, when the discussion of Invenenergy came up with all of the issues related to the water from the contaminated well field; PUD negotiated with Invenenergy so that Bob's firm would represent PUD in all aspects of the water that would be provided to that plant if it goes forward. In this way if the project goes forward, the District will be well protected in all aspects of the pipeline, the treatment plant and the withdrawal of water from the contaminated field.

Mr. Bernstein stated that it is far from legally certain that we are going to be able to develop these new wells as there are a lot of hurdles that we need to get through.

Mr. Frank Silva -Based on your experience with RIDEM approvals, and this infiltration gallery being unique to RI or is this common?

Mr. Ferrari-To my knowledge, this would be the first river bank infiltration gallery in RI but the methodology is used in many other states and other countries. Essentially what's happening is there's a sand and gravel aquifer that runs parallel to the river and under the river and by tapping into that we're drawing water out. That's water that would either be drawn from the river or water that was going into the river. It has a very high yield and favorable for water extractions. There's also another area in Gloucester that we're looking at that is just a sand and gravel area for a well field.

Mr. Frank Silva -Do you have an idea of the output of gallons per minute?

Mr. Ferrari- We have done our model up to 400 gallons per minute. We did a pumping test program at a much smaller rate at about 26 gallons per minute and then extrapolated that data to a model that would evaluate pumping at 200/250/350/400 gallons per minute and in doing that we were able to assess the response of the aquifer and the impact on the aquifer and the river and the wetlands and things of that nature. That doesn't mean you have to operate it as 400 gallons per minute but that's what we took the model up to because we wanted to stress it both at average conditions and at a pumping condition that would meet or exceed anything we ever thought of doing.

Mr. Frank Silva - So you have done extensive work in waste water and other areas?

Mr. Ferrari- That is correct.

Mr. Frank Silva -What about with MBTE? Have you dealt with that?

Mr. Ferrari- Absolutely.

Mr. Frank Silva -Remediation work?

Mr. Ferrari- Myself and members of my firm have extensively been involved in remediation projects, directly or working as subcontractors for other engineering firms. One of the aspects on the work that has just been completed on the groundwater model was to assess and evaluate the potential impacts of the known contamination zone because we're not that far away from the contaminated well field. A big part of the model was to assess, if we draw this water through this river bank infiltration gallery what is the potential for drawing water from the contaminated zone. The contaminant levels have gone down significantly in the area as seen by periodic rounds of monitoring conducted in 2005, 2008, 2011. Then we did another round of monitoring at the end of 2014 and the levels of contamination have gone down significantly but they're still there. The plume has been moving in a west, northwest direction actually away from the proposed area of the infiltration gallery. We did evaluate that because that's an important consideration obviously. Under realistic conditions, 98% of the water was being drawn from the Clear River and the underlying sand and gravel aquifer, with only 2% coming from the up-grade area in the direction of the old well field. Under the most conservative conditions 96% is being drawn from the Clear River and the underlying aquifer, and only slightly under 4% would be coming from the upland aquifer areas. So that's a beneficial aspect of these models.

As far as the proposed power plant project is concerned, we're giving rigorous scrutiny to what their proposals are as far as if water is extracted from the contaminated well field- what is the treatment methodology, what equipment is being used, how will it be operated and all the factors that go into that have to be fleshed out substantially but we are on record with the developer as far as what we are looking for and what we need to review.

Mr. Frank Silva -Last check of the field was 2014?

Mr. Ferrari- Yes that's correct

Mr. Frank Silva -Have you been monitoring well sites all around the area?

Mr. Ferrari-That's correct, there's probably roughly 40-60 monitoring wells around the field. We've sampled maybe 15-18 of the wells that were in the area that we were concerned with relative to existing contaminated well field and the area we're looking to develop.

There was enough data that has allowed us to do a level of modeling of what was happening relative to the contaminant plume in the area of the old Pascoag wells.

Mr. Frank Silva - Has RIDEM provided you with any data to go by or have they stopped monitoring?

Mr. Ferrari- To my knowledge they have stopped monitoring, which is one of the reasons the District has funded this effort because we need to have ongoing monitoring. RIDEM has opened up their files to us completely because those are public record files and if you file the appropriate forms you can examine the files. There's a staggering amount of information available and we did go through that because we wanted to make sure we had all of the critical information relative to what our needs were. To my knowledge their last round of monitoring was in 2011 and they have not planned any subsequent rounds of monitoring.

Mr. Frank Silva - In 2014, when you did the monitoring of the testing wells, fourteen or eighteen or however many you did, were they closest to the newer infiltration gallery so they didn't cover anything beyond that scope?

Mr. Ferrari- Well they were the observation wells that are really northern and northeastern portion of the array of the wells because that's what is between the contaminant plume and where we're looking to develop the well fields. That is our area of concern as opposed to say, going further to the south on Pascoag Main Street where the Mobile station was or the releases occurred-we weren't in that area.

Mr. Frank Silva -Have you received anything from Invenergy on what their plan of action is going to be or is it just not that far yet?

Mr. Ferrari- The basic response is that we're just not that far yet. They've given us a simplistic concept and we've reviewed it and advised that we need to see much more advanced information on that.

Mr. Frank Silva - Because it is pretty expensive and we all know that. You got sixty monitoring wells out there roughly and you would think the first thing they would have to do is sample everything just to get an idea. Your company is concerned about the draw of any contaminants coming into the infiltration gallery and rightly so. We certainly want to take that initiative because we don't want another contaminated well for sure. I think you've answered most of my questions.

Mr. Jeremy Bailey-Wallum Lake Rd- I have a couple of questions on the MTBE. So when you were doing your samples, what were the highest and lowest levels of parts per billion that you saw throughout the wells-ballpark?

Mr. Ferrari- We were looking at in most cases single or two digit parts per billion levels. There may have been one or two that were triple digits. Essentially what we found when we looked at Benzene, TBA, and some of the other things that have been monitored over the years-in all cases the concentrations in those monitoring wells is significantly lower than what is used to be, anywhere from a factor of 10 to a factor of 100 depending on where you are and which parameter it is. So that's the good news, it's going down but it's still there. We were able to take this data and by working with this data and the previous three-four rounds of monitoring, we modeled each of the previous rounds and then compared it with the time current data. We compiled this in January/February of 2016. We were able to use that to project what the MTBE plume looks like now and what levels it's at. The plume has been moving in a north, northwest direction and was headed away from the well field which is not unexpected. It's going toward the Pascoag River as opposed to going northeast towards the Clear River so we were able to model it in that respect. We have provided data to multiple parties that have requested it, including the Town of Burrillville; they've retained a consultant and we've provided all the information that we have that goes back to 2003. Our view is that it is important for this information to be out there and utilized by all parties.

Mr. Jeremy Bailey-I'm assuming you also took samples from wells 3 and 3a as well?

Mr. Ferrari- Last summer I personally took samples from well 3a as a matter of fact. We ran it for about four hours and ran a full VOC scan. Interestingly, it was all non-detectable with the caveat that we only ran the well for four hours.

Mr. Jeremy Bailey- As part of this process is the whole goal to just throw a filtration system in and not do any remediation or is there a remediation plan in place before the filtration system is even turned on?

Mr. Ferrari- I won't speak for Invenegy but what they have represented to the Utility District is that the water would be pumped out of the ground, (flow rates to be determined) and it be treated onsite by a carbon filtration process which is nominally speaking that is the standard treatment methodology for removing contaminants such as MTBE, Benzene and TBA, things like that. So in that context, yes that's remediation. It's pumping and treatment but that's remediation. In fact, when efforts were made earlier at trying to remediate the

well they were using essentially the same process-carbon filtration. So the issue at this point, from my perspective what are they proposing to use? My issue is how are they sizing these units? What are the flow rates? At what extraction rates? What are the absorption rates in the carbon? How are they going to operate the vessels at these varying flow rates that they might be drawing water? Those are still open questions.

Mr. Jeremy Bailey-To my understanding using the carbon filtration system at much higher flow rates diminishes the effectiveness of the filtration system?

Mr. Ferrari-The simple answer is yes but all a filtration system such as granular activated carbon you've got a hydraulic range, say a hydraulic loading rate like gallons per minute per square foot of bed over cubic foot of bed. You've got a range that you can use where the carbon will function effectively. If you exceed that range, higher or lower, it can be problematic. A number of things could happen; most of them aren't necessarily good. That's the detail we're requesting. We don't know what they're proposing yet in that respect.

Mr. Jeremy Bailey- What do we expect from this MTBE plume once we start drawing? Let's say they start drawing a million gallons per day and we know the plume is moving in the opposite way I'm assuming we expect that plume now to start shooting at a pretty rapid rate heading down towards wells 3 and 3a?

Mr. Ferrari- The general expectation is when you start pumping well 3a, and again appropriate pumping tests and modeling need to be performed, but the expectation is that to some degree the plume is going to start getting drawn to well 3a. Outstanding questions are, how fast? At what rate of movement is it going to be? At that point it's what is the expectation as far as the concentration of the organic contaminants? How does that translate into treating them and removing them from being pumped out of the ground from Well 3A.

Mr. Jeremy Bailey- With the test samples that you have done, is there a chance the numbers are highly inaccurate based on the small amount of time used to pump them? Once you start pumping let's say 300 gallons per minute for ten days, now all of a sudden you're pulling more. Is there a chance that those numbers could be way off?

Mr. Ferrari-The program we did at the end of 2014, where we went to the various observation wells, we went through with the approved protocol. That's what was in the ground at that location, at that point in time, whatever the concentration happened to be. The ground water was moving at whatever the gradient was through the ground and we

also looked at groundwater elevations. We know what the groundwater gradient is because we know what the groundwater elevations are, having said that I'll be the first person to tell you that I was asked to take a sample from Well 3A and the District pumped it the day before for a few hours and then pumped again in the morning for as long as they could before I showed up and we took a sample. Frankly, we got the results which I would have expected, which were non-detect. In presenting that data to the various people involved in the project I've said please understand, this sample was non-detect under a minimal pumping scenario but this isn't representative of an increased pumping scenario.

Mr. Jeremy Bailey- So the model that you did really doesn't model how Invenegy may use this well?

Mr. Ferrari- It depends which model you are talking about. Our model of the infiltration gallery is what our proposed withdrawals are and the implications. The modeling we did relative to current status of the contamination in the ground was based on static snapshots at that point in time. Again, one of the things we have advised Invenegy of is that they will execute some level of pump testing program and a model like we did because they have to assess and we have to review it and it has to be acceptable to us-what's going to happen if A-they start doing those extractions at these different rates they'll be pulling water out of the ground at, what are the implications relative to remediating the contaminant plume and B-what are the implications relative to the potential impact on our proposed withdrawals? Because our proposed withdrawals are the first priority and by the way RIDEM has the same position on that.

Mr. Jeremy Bailey-In any of your modeling, have you modeled or know the potential drawdowns of ground water with the new infiltration well and Wells 3 and 3A; which I believe one is in bedrock and one is infiltration-is that true?

Mr. Ferrari-Those will be hybrid wells. Well 3A was drilled about ten feet into the bedrock. It's a highly weathered bedrock surface at the interface with the soil and is very productive. I was not involved in the installation of that well but the geologists we were working with were involved. I just lost track of your question?

Mr. Jeremy Bailey- Ok my question was have you done any analysis on the potential new well (the infiltration system) and running both that and the contaminated well at different draw down rates and what that will do to both the groundwater and to the aquifer below?

Mr. Ferrari- The short answer is no. We've run our model relative to looking at the groundwater contours and the drawdowns to the extent that they go with our proposed pumping scenario which is based on 200-400 gallons per minute. Again, this is one of the key points that has been stated to Invenergy and is that they are going to have to do that model and that the District should not shoulder that costs because these models aren't cheap. That is the responsibility of Invenergy. I've provided some information to their consultants relative to baseline information. That's one of the key outstanding questions. The proposed Invenergy groundwater withdrawal cannot realistically go forward until that is very thoroughly vetted and all parties are realistically satisfied that there's not going to be an adverse impact because the primary concern at the District level, at the Town level and at the State level including DEM and the Water Resources Board is the public water supply will be the primary interest. That must be satisfied and protected including future projections of need and demand before any other use can be considered or satisfied.

Mr. Jeremy Bailey- Ok so I'm going to circle on back to the MTBE for a little bit. As far as the MTBE goes, let's say that this project goes through and the carbon filtration system is up and running and it's been running for six months and all of a sudden there's a big pocket of MTBE that didn't show up in any of the models or the samples and now it pulls it in. Now there's a much higher level of MTBE going through that well. I guess the question might be more for Mr. Bernstein then, what's the protocol;-can we shut the well down and say they're above non-detect and the well has to be shut down until this is fixed?

Mr. Bernstein- I can't say for certain because we aren't that far along in negotiations but it's certainly a possibility if it gets to dangerous levels. I'm sure there will be some State agency that steps in and say you're way above the parts per billion that's required to pump at a Federal standard. So it's certainly a possibility. We haven't negotiated that.

Mr. Jeremy Bailey- What's the Federal standard?

Mr. Bernstein- 40 parts per billion.

Mr. Jeremy Bailey- Ok, I'm going to argue that, that's not the Federal standard.

Mr. Kirkwood- Why don't you let Bob respond to that because he's the expert on that.

Mr. Jeremy Bailey- Ok, sure.

Mr. Ferrari- First of all I want to assure you that that is one of the first issues we raised when they presented their concept for the carbon treatment system. Their original proposal was that they would treat to the Federal drinking water standard which was 40 parts per billion.

My response was that initially you might not be treating at all because it's below that standard and our view is, we want that groundwater treated because on a day to day basis you may not know what is coming into that treatment system and what's being extracted out of the ground from Well 3A. So there has to be a monitoring program that's in place not just for what's coming out of the treatment process that lets say is going to go into a pipe and then go down the road to the power plant but what's coming into the filtration system which means there has to be a monitoring program in monitoring wells that are say arrayed in the direction the plume is coming from so you have a pretty good idea of what's approaching and what you're dealing with for better or for worse. Because you have to adjust the operation of the treatment system. The way the proposal stands now is that they have to pay for the construction of the treatment system as well as the pipeline, pumps and everything else. Pascoag would operate that system and part of my job is to advise the District on what they're looking at cost wise because the District will charge Invenergy to run that treatment of the Well. So advising the District and my advice, (by the way DEM would tell them the same thing) is that we have to know what's coming in to be treated as well as what the standard is going out. The reality is this, it's very hard to dial in and say, we're going to discharge 40 ppb or 10 ppb, pick a number. If you run a carbon filtration system correctly you're going to have zero or close to zero coming out but overtime as the carbon exhausts you get some leakage. The issue is going to be, what are we defining as the cut point where we have to replace or regenerate the carbon and that comes back to what is the size of the vessels? How many trains of vessels do we have? How much redundancy do we have? Those are the questions that are totally unanswered at this point in time.

Mr. Jeremy Bailey- I know you are referring to a federal standard for MTBE but I don't really believe 40 ppm is the federal standard for safe water. I believe 40 ppm is where it's detectable by smell. Really the only safe level of MTBE is a non-detect. That's not just my opinion, we've been speaking with Santa Monica, California and they've been through this extensively and anything less than 1 ppb is unacceptable

Mr. Ferrari- I'll be the first to tell you I would be disturbed with a 40 ppm limit. We have not established any such standard with Invenergy. All we have so far is a process flow concept but there are a lot of details that need to be filled in. They're going to have to comply with a sewer ordinance and discharge limits as well so that will be another level of constraint. So there are two levels of oversight here.

Ms. Roberta Lacey-Spring Street-Is there a name of the company that Invenergy is using and do they have experience in remediation?

Mr. Ferrari- To my knowledge, they have only provided a concept but they haven't given us a name of a manufacturer.

Mr. Frank Silva -So now the modeling you've done for the infiltration gallery. Are you going to continue to test that, assuming you get approval to operate that well?

Mr. Ferrari-On the assumption that we're going to be submitting to the State and as Bill said a while ago there's still a long road to go down-we have DEM reviews, we have Water Resource Board reviews but assuming everything goes well and the full scale gallery will be installed. The short answer is yes but as part of our proposal we'd have an ongoing monitoring program of groundwater elevations and groundwater quality for VOC contaminants. We are proposing to have multiple rings of monitoring wells, near the well and further out, coming towards the contaminated zone in addition to the existing monitoring wells because we want to carefully and thoroughly monitor what direction are things moving in the ground and are contaminants moving in the ground and if so where are they going? So we will have an ongoing monitoring program that has been written into the plan with DEM. We also have monitoring of the pump going out of the ground. Our proposal also includes online and real time monitoring of VOC's. As a public water supply we cannot take any risk. We need to have zero risk to the public. That's the position we are taking on this because that's the only way, the District, the consumers and the State can have confidence about this going forward. There's one thing to be able to extract the water out of the ground but we also have to be able to make sure the quality of the water is good that day but also what's happening in the aquifer, we need to monitor the aquifer. Now with Invenergy coming in to play, we know we have roughly 60 test wells out there.

Mr. Frank Silva -You as a hired consultant of the District and in protecting the District's interests, will you recommend that all the wells be tested prior to a static test?

Mr. Ferrari- I wouldn't recommend that all the wells be tested. A plan has to be defined of which wells require testing because there's a criterion for establishing which wells should be tested. For example, some wells are drilled into bedrock, you have to monitor both bedrock contaminant levels and overburden contaminant levels. That's a factor we look at. We have already requested that Invenergy has to come up with an analytical methodology, a testing program, to assess the impact of their pumping. If (from their standpoint), their best case

scenario is they're in business five years from now and water is being pumped out of the facility, part of that plan has to include a long term program of monitoring the water characterization of the ground water and the array of monitoring wells and the ground water elevations because you have to do monitoring of the hydraulic radius in the ground and the water quality in the ground because you have to keep track of these contaminants.

Mr. Frank Silva - So now you're assuming the plume is a distance away from Well 3 and 3A and possibly back towards the source of contamination or closer to it.

Mr. Ferrari- It's moving westward towards the Pascoag River, is the general direction it's moving in.

Mr. Frank Silva - From my conversations with Marion Cordessa, Water Manager from Santa Monica, California what they found was, once they shut down the wells-they had 700 parts per billion, and they didn't reopen them for 14 years. During that time there was remediation, legal things that went on, a settlement with Exxon Mobil/Chevron which helped to remediate their facility and to handle their water needs. At that time they lost 85% of their water capacity so they had to buy water from another District which was very expensive. What they found in that process was that by going to the source of the pollution they did the remediation. The ground was cleaned up and the soil and they started cycling the water in that area and it brought the plume back to the source so by the time the State stepped in and the Feds, they turned the well back on and they were down to 3-5 parts per billion. Now the carbon filtration system which they use, removes only up to 90% of contaminants but at 3-5 parts per billion it became undetectable. So, one well was able to supply potable water back into the system which was a big relief to them. The second well did not have the same results and they are expecting it will be five years before they can use it. What I'm getting at is remediation was the solution and I'm not so sure that just drawing from 3 and 3A-are you pulling the plume further into the aquifer not knowing where that plume really is? I've read some reports where the plume is at least 100 feet in depth. Is it best that we remediate at that source and is that something you'd recommend that Invenenergy would start that process ASAP?

Mr. Ferrari- All things being equal, having remediation in close proximity to the source is typically the way to go. You want to be in your highest concentration area. I also have some familiarity with the Santa Monica situation. Their experience is very telling. What you are suggesting is not a bad idea but I will tell you that as recently as ten days ago I have met

with the consultants from Invenergy and was discussing with them what the aspects of the pumping test program and the ground water model that they should be using. And I told them that we have a lot of unanswered questions here and that it's not just Pascoag that is going to want those answers it will be DEM, Water Resources Board and the Town and the Citing Board will want those answers and that's on them to do the appropriate levels of investigation and monitoring and developing those models. Frankly, I think this is the area where the vulnerability of their application lies. Since they've had their consultants talking to us, I assume they are moving forward in that direction but we are waiting for them to respond

Mr. Frank Silva - Is remediation in their plan?

Mr. Ferrari- It is in the context that they plan to take the water out of the ground and treat it, is nominally remediation.

Mr. Frank Silva - Right, coming out of wells 3 and 3A but what about where the plume is?

Mr. Ferrari- That's where the model comes into play. That's the unknown question right now.

Mr. Frank Silva -I just don't want to see that plume...if it's 1500 feet away, let's keep it 1,500 feet away, treat that and draw whatever contaminants out of it rather than drawing these contaminants across a larger field and possibly if it comes down quick enough, to contaminate the infiltration gallery even though the infiltration gallery probably sits at a higher elevation?

Mr. Ferrari- The infiltration gallery sits at a much lower elevation.

Mr. Frank Silva - Is it lower than 3 and 3A?

Mr. Ferrari- Oh yeah. Again, we've done our modeling and our model has been validated with 95% correlation to our pumping test data which is excellent correlation. My point is that whether you are for, against or neutral to the power plant it's in everybody's best interest that what you are asking for be assessed and we're asking for that.

Mr. Frank Silva -I think the remediation, that's the solution as far as getting the contaminants out of the ground as opposed to possibly spreading it further down and if it infiltrated the infiltration gallery or goes further down into the aquifer because they're going to need a high volume of water. We don't know what the parts per billion will be at 3 and 3A once they start the drawdown because those numbers could really ramp up, we just don't know.

Mr. Ferrari- It has to be vetted. Again, the key issue that has to be properly addressed is that it's on Invenenergy to properly address that to satisfy all the assorted public bodies and agencies. They will be mandated to do that, I have no doubt.

Mr. Jeremy Bailey-Any idea of a rough cost for the filtration system?

Mr. Ferrari- More than \$100,000, less than a million depending on the variables.

Mr. Jeremy Bailey-So we're waiting on Invenenergy's consultants so at the point we get that data back can we have Mr. Ferrari come back to discuss this further?

Mr. Kirkwood-Absolutely

Mr. Ferrari-Anything that Invenenergy formally submits is public record to the District and to anybody who requests it.

Mr. Palmisciano- I had talked to Mike about monitoring the levels of MTBE. Is there a system where coming out of the well it can be tested instead of sending the sample out and getting an answer a week later?

Mr. Ferrari- Yes as a matter of fact that was one of the key items Mike and I have been discussing these last few weeks as we've gotten down to the finish line on preparing the submittal for DEM. I have been focusing on two alternatives, one is less expensive but it's easier to operate and less complex and one is more expensive both in capital costs and operating costs because it's a miniaturized chromatograph. Realistically speaking these are online devices that would provide real time information. We've written this into our scope so that in addition to having an array of monitoring wells-that's like our early warning radar system if you will, monitoring ground water elevations/gradients and if there are contaminants approaching this will also tell us if there are contaminants in the ground water we're pumping. And depending on the instrument you can monitor either total VOC's or specific ones such as MTBE. These devices can get you down to 5-10 ppb and you're not going to get any better accuracy than that and if someone tries to tell you that it's not going to be accurate-they're blowing smoke. That is excellent accuracy. We've already proposed that in the scope and there will be a line item for it in the budget we're preparing.

Mr. Kirkwood-And this is actually for the infiltration gallery but we'd require the same thing of Invenenergy.

Mr. Ferrari-And we brought that up, by the way, in September or October of last year with the Invenenergy folks, that they need to anticipate and plan on online monitoring because this is one of the big questions and a potential deal breaker.

Mr. Ferrari- I'll be really honest with you and this is just my opinion but if I was "Mr. Invenergy" if you will-I'd have a monitor on what was going into that filtration system and another one on what was coming out of the filtration system because I'd want to know what was going on because I don't like surprises. Since Pascoag Utility District will be responsible for operating the system-we don't want Bill Guertin or Mike Lima running back and forth every day from the laboratory bringing samples-running up truck mileage, you want an online analyzer and you don't want surprises. And that would be one of the worst surprises you could get and I'm not saying that Bill or Mike wouldn't be paying attention but the only way to monitor this system properly is with online real time monitoring-it's the only way. If you brought the samples to a laboratory and you don't mind paying the premiums you are at least 24 hours after the fact and realistically more like 72 hours or a week after the fact.

Mr. Kirkwood- And we would actually bring it online with the SCADA system and everybody knows here that I watch that thing like a hawk-not for the MTBE right now but for all the other things so it would be right on my desk every day plus it would be alarmed so if it happens in the middle of the night both Bill, Mike Lima and myself get an alert.

Mr. Jenks-if it got to the point where carbon filters needed to be changed, which I'm sure they would after a period of time, is that cost going to be on the power plant?

Mr. Ferrari-Theoretically, the way it's structured at this point in time, the District would operate the treatment system but they're charging the power plant a rate structure to presumably recover the cost. However, as I've said, we don't want a bad surprise. We want to have upgraded monitoring of the monitoring wells in order to see what's coming towards us that we have to deal with because it could take years. You could come up with something a half mile away but it could take five years to get here so you have time to deal with it but by the same token that's a critical question. My biggest concern is that we have to move past this conceptual, one line process flow diagram and they have to run some level of treatability work or at least come up with enough data from similar systems to say-we've run our analyses, here's what we think the use-rates on the carbon is going to be, here's the pumping rates for the carbon, therefore here's what we think the change-out procedures to be and you know initially we had zero coming out but over time we started getting more and more leakage. One of my concerns and by the way when a number of studies were done back in 2005 and 2006 trying to determine what was the cost of remediation going to be-the carbon wasn't exhausting on MBTE, the carbon was exhausting on another

parameter, TBA. That was the killer on the cost and so that we've raised that question because that's got to be accessed. Yes, everyone is focusing on MBTE but there are other organics in that ground water that have to be dealt with and that may be ultimately a bigger problem. That's why we need to have a ground water model done. How is the ground water going to react and where are you going to draw from? Presumably at some point I'll be making a presentation to the Board here, relative to the groundwater model that we're doing for the gallery. We can show you the particle flow lines or trace lines, here's this area of the District and here's where we're drawing water in. There's a methodology and they need to do that because we don't want surprises because the District is going to be operating that system and I don't want Bill to get that phone call at 3:00 in the morning-I really don't.

Mr. Jenks-Will the plume shrink over time?

Mr. Ferrari- Well it has been. When you say shrink-the concentrations have been declining, now part of that is due to it slowly draining into the Pascoag River and being swept along the river and is being diluted by factors of thousands in the river but also some are being absorbed by particles some are being taken up by organisms and bacteria that consume these organics. Believe it or not there are certain forms of iron bacteria that if you introduce them to volatile organics their growth rates go exponentially and we had a lot of fun with that with VOC contaminated soils in the eighties and nineties, watching six inch pipes clog up in three days full of iron bacteria. The plume has been moving nominally in a westerly direction toward the Pascoag River so the levels are going down and the plume is stretching in that direction but it doesn't mean it's gone in the original contaminated area. Maybe it was 10,000 ppb, ten years ago- now it's 1,000 or 700 so that's the good news. It's been operating under nominally the natural hydraulic gradient which is variably seasonally and it's just been undergoing what I would call natural dissipation for the most part. The State ran a pump test in 2005 for about forty or fifty days so I'm sure that had some impact and then they shut it down so the key thing is what is going to happen if we start pumping from the infiltration gallery which I think we've accessed pretty well, or what's going to happen when we start pumping from 3A or the infiltration gallery and 3A? That's the big question, we've done our job relative to the infiltration gallery, and it's going to be up to Invenergy to execute the following studies. And if they haven't gotten that yet, they're going to get it when they go to RIDEM.

Mr. Jenks- In your opinion, what is the lowest standard you can get from the filtration unit?

Mr. Ferrari- As far as treat to X? Treat to this level?

Mr. Jenks- Like coming out of the filters. I'm sure you can't get zero.

Mr. Ferrari- What you would do is say we want to get to non-detection which is probably around 5ppb. Realistically what you can do is treat to the detection level which for MTBE it's probably around 5ppb. What's the standard used here-their argument will be that they're not drinking the water, it's a segregated line, and it's used for cooling and other industrial power plant consumption so we shouldn't have to treat to the non-detect level. However, our response was you need to treat this water and you need to treat it at the wellhead because you're not going to pump contaminated water up the road three miles or wherever it's going to be and then treat it at your power plant. The original suggestion was to treat it at the power plant and we said no. If you want to run into a hornet's nest of opposition tell people you're running contaminated water past their house.

Mr. Kirkwood- And for what it's worth, Al and Mike Kogut have been going to the meetings Invenergy has been holding at the library and Invenergy is saying they will be treating to non-detect.

Mr. Ferrari- Good, and again we have been in our role as...we're not in charge of their work but we have been reviewing and providing oversight of their work and we have been telling them so if they're coming around to that then that's a beneficial thing. They still have a lot of technical data and engineering data that we need to see. As far as I'm concerned, it's still very early in the game. And I appreciate when members of the public come and ask information and I'm not trying to be difficult but until I see what they're coming up with I can't answer. It's their job to come up with this study or this evaluation and then we get to review it and critique it.

Mr. Bernstein- And I think that there's room in this Letter of Intent, if our issues are not resolved, for negotiation. We should insist on treating to non-detect and that's what we should do and put it in the final contract. It doesn't mean it will be zero but it will be non-detect.

Mr. Ferrari- To be honest, there's no difference in capital cost to say that you're going to treat to non-detect, it's the same equipment. There will be a difference in operating costs because you don't want to overrun the carbon and get to a situation where you have leakage and it exceeds detection. So it's more of an operating cost issue than a capital cost.

And that's on them but we need to determine the operating costs. We need to figure out what we will charge for the water so that we will recoup all the costs. We can't do that until we have a pretty good idea of what they're going to do and we've already critiqued the design and if and when we come to an agreement on that, then figure out what the costs are going to be.

Mr. Demelim-You've said that for what's available it will treat to 5ppb? So 5ppb is basically as low as it can go.

Mr. Ferrari- Yes, for what's commercially available in the marketplace, realistically speaking it's 5 ppb.

Mr. Demelim-If you bring it to a lab what can they detect to?

Mr. Ferrari-Typically about a half part per billion to around 1 part per billion. Keeping in mind those are tightly controlled instruments in a laboratory environment. We're talking about instruments that are going to be in a pump house that's in the outdoors that isn't normally manned so we need to look at temperature control and humidity control because those things affect instruments. So realistically speaking, in an unmanned situation, in a pump house they're being able to treat to 5ppb. My point with that would be obviously if we make that the realistic detection limit that still gives us a good warning, if you've got leakage you can switch trains and do what you have to do. You have to keep in mind that you'll always need two trains so you always have one fresh train to bring online. So if you are getting some leakage you can switch trains.

John Demelim-What is TBA?

Mr. Ferrari-It's another volatile that is in fuel associated with the original fuel tank leakage. Per milligram of this material per unit will take up more of the carbon filter than MTBE will. MTBE is the canary in the coal mine. It's one of the lighter materials so if you have a fuel leak you always see MTBE first but when you're using granulated active carbon for the removal of these materials, heavier molecular weights will use up more of it than the MTBE will. So that's why you have to look at it carefully. In 2006, when they looked at treatment here and what they found with the concentration being so high was that it wouldn't be the MTBE that used up the carbon but the TBA.

Mr. Demelim -So when the leak went into the ground the MBTE went further and the TBA stayed closer, traveled slower-more or less?

Mr. Ferrari-In lay terms yes.

Mr. Demelim-So when MTBE was in the gasoline it was probably 5%-10%?

Mr. Ferrari- Probably something along those lines.

Mr. Demelim- And TBA? What percent?

Mr. Ferrari- Off the top of my head I don't know. I can go out there and show you what the concentration was in the ground but what the formulation was at that time, I don't know.

Mr. Demelim-For their tests for what they do, how long will the period of time be? You said for the State it was for forty or fifty days but that wasn't at a full rate.

Mr. Ferrari- They were actually pumping Well 3A at 246 gallons per minute for forty or fifty days and then they dropped it down to like 150 for a day or two at the very end because they wanted to see the response of the aquifer. They were checking elevations and doing sampling in many of the monitored wells. There's a massive database at DEM. If you've heard about the thirty feet of archive storage-that's the middle of it. The test would be probably about five feet of that.

Mr. Demelim-Would that test be something that would have had to been done again?

Mr. Ferrari- Right now that's an open question. I don't want to necessarily speak for Invenergy. The pumping test that is being discussed right now, we have to keep in mind that they have a normal pumping rate or summertime pumping rate and then they have theoretically their maximum or winter pumping rate-if they switch their fuel from natural gas to oil fired which is a massive increase in their water demands so they may have to go let's say from 60 to 70 to 100 gallons per minute to six or seven hundred gallons per minute because the water requirements from oil firing are substantially different. So the dilemma they have, based upon the last time with DEM in December, is that DEM said we think you should do a pumping test at this higher pumping rate, even if you're going to only operate at that rate for a few days in the winter-not for months at a time but a few days. We just want to see the response of the aquifer and so I think the question hasn't been fully answered yet. Could they use this 2005 pumping test which was done by DEM and URI which by the way is a very good piece of work-could they use that as a model for the lower pumping rates and still run a pumping test at the higher rates? That's an open question right now, we don't know where that's going and I'm not going to tell you that we do. We don't know what they're going to propose but what I can tell you is that the engineers and consultants for Invenergy have asked me for information to facilitate their developing their pumping test proposal. We're still waiting to hear back.

Mr. Demelim- So the normal use is 60-70 gallons per minute, 24 hours per day?

Mr. Ferrari- Yes, on a 24 hour basis.

Mr. Demelim- And when they go to oil, it's ten times that?

Mr. Kirkwood- It's like 156 gallons per minute.

One of the things we asked them to do and they did this for us is we have to look at your different operating levels and determine what your water levels are going to be. It's going to vary because in the summertime you'll have more cooling water needs than you will in the winter time but in the winter time if you go to oil firing because you have a shortage of gas, you'll need six or seven hundred gallons per minute versus a lot less than that the rest of the year. So they actually gave up with eight or ten different operating scenarios and each had a different water demand associated with it. Now it's up to them to make their proposal of what they think they're going to do because it was made abundantly clear to them that they had to get that summertime water demand as low as possible.

Mr. Demelim- What's the pumping capacity of Well 3A?

Mr. Ferrari- When it was originally installed, it was pump tested up to 700 gallons per minute. It was a tremendous well. It was one of the most prolific well fields in the State. It might have been the most-but I won't go that far. Unfortunately six months in...it was just horrifying what happened. So one of the reasons that I think that well is attractive to Invenegy is because it can pump six or seven hundred gallons per minute, there aren't too many wells around that can do that but the issue isn't so much what can that well pump but what kind of yield can you take out of the watershed? That's the bigger issue. You can always find a pump big enough to pump what you want but what is the effect on the water shed.

Mr. Demelim- What was the water shed yield back then?

Mr. Ferrari- Well it hasn't changed in all these years, nominally speaking but that might be up for review at the State level. The water shed yield is defined as the seven day low flow period that appears every ten years. The entire Clear River water shed has 5.1 million gallons per day but that is at the mouth of the water shed which is down river a ways. At the point in the aquifer where the infiltration gallery is and Well 3A nominally is, in the summertime it's 2.6 million gallons but you're only allowed to remove 30% in July, August and September. Harrisville can work off of a larger number because they're further down the stream. These extractions would be factored into that.

Mr. Demelim- So it would be a lot simpler if let's say they were at a constant of 300 gallons- as far as with the carbon filtering it because if you go up and down you get the leakage?

Mr. Ferrari- Any filtration type treatment system likes to run on average conditions. If you could drive your car at 55 miles forever, you'd probably have an optimized engine and fuel mileage-on flat road but you live in Burrillville, that's not reality so that's never going to happen. The problem with hydraulic filtration systems is that they have a range of hydraulic loading per square foot of bed area or per cubic foot of bed area. They want you to stay in that range, if you start moving out of that range is when you start getting yourself in trouble. And on/off cycling is never good either. So again, these are the sort of issues that need to be dealt with.

Mr. Palmisciano- Anyone else have any questions before we close out of this? Everybody good?

- **Committee Comments**

- **Good and Welfare of the District**

- A. Docket No. 1725

- Ms. LaPorte reviewed the customer shut off information. There were 5 standard customers terminated in the month of May. Pascoag Utility District sent 339 disconnection notices for customers whose past due balances were more than \$200.00. Motion to receive and file made by Mr. Kogut, seconded by Mr. Lees. The vote in favor was unanimous.

- B. Exxon Settlement Fund

- Ms. Round stated that there was \$473.23 in interest to the settlement account which brings the balance to \$722,838. There has been no activity in the settlement CD with a balance of \$512,106. There was a motion to receive and file made by Mr. Jenks, seconded by Ms. Polacek. The vote in favor was unanimous.

- C. Greenridge/Fernwood Update

- Mr. Guertin stated that Fernwood is being worked on. Greenridge will be going in shortly as you can see from the work being done off of South Main Street.

- D. Water Flushing Program

Mr. Kirkwood was happy to report that we have finished with an intensive flushing program. The hydrants cleaned up faster this year and we tried very hard to advertise the flushing everywhere we could. We had fewer complaints than in previous years.

E. USDA Water Main Cleaning/Lining Project

Mr. Kirkwood said that we had a pre-bid meeting last week. USDA has to approve each step but they have been very good to work with. Three parties have already picked up the documents and are looking to bid on it. We'll open the bids on June 2nd.

F. Earth Day Poster Contest

Ms. Dolan stated that the poster contest award ceremony was held on May 17th and it went very well. They now have all the drawings that will be included in the 2017 energy conservation and recycling calendar.

G. ASRWVA Conference

Mr. Guertin stated that he, Mike Kirkwood, Mike Lima and Chris Piccardi attended. Mike Kirkwood gave a good presentation on PUD's grant application process. They attended some good classes and had a productive day.

H. Cyber Security Presentation

Ms. Dolan stated that Sean Daniels came into the office to give a cyber security presentation to office staff. The presentation was very informative and staff remarked on how helpful it had been to attend.

- **Approval of Minutes**

- Regular BUC Meeting- April 25, 2016

Mr. Jenks made a motion to approve the minutes as submitted, Mr. Kogut seconded the motion. The vote in favor was unanimous.

- **Unfinished Business**

- **New Business**

- **Financial Reports**

A. Electric Department - March 2016

B. Water Department - March 2016

Ms. Round reviewed the electric and water department financial statements.

Mr. Kogut approved the financial reports, seconded by Mr. Lees. The vote in favor was unanimous.

- **Adjournment**

Mr. Jenks made a motion to adjourn, seconded by Mr. Lees. The vote in favor was unanimous. The meeting was adjourned at 7:48 PM.

Michael Kogut, Secretary
Board of Utility Commissioners

Desarae Dolan, Recording Secretary