

GROUNDWATER RESEARCH SUBCOMMITTEE MEETING RECORD

TIME AND DATE:

9:00 AM, Wednesday, October 10, 2012

LOCATION:

Texas Commission on Environmental Quality Campus Building F, Room 2210, 12100 Park 35 Circle, Austin, TX 78753

PURPOSE OF MEETING:

First quarter regular business meeting

AGENCIES/ENTITIES REPRESENTED:

Bureau of Economic Geology [BEG]
Texas Commission on Environmental Quality [TCEQ]
Texas Department of Agriculture [TDA]
Texas Groundwater Protection Committee [TGPC]
Texas State Soil and Water Conservation Board [TSSWCB]
Texas Water Development board [TWDB]

ATTENDEES:

Bridget Scanlon	BEG, Co-chair of the GW Research Subcommittee
Cary Betz	TCEQ, Chairman of TGPC
Mike Chadwick	TCEQ
Alan Cherepon	TCEQ
Richard Egg	TSSWCB
Michael Hare	TDA
Janie Hopkins	TWDB
Joseph L. Peters	TCEQ

MEETING SUMMARY:

Call to Order and Introductions

Dr. Scanlon called the meeting to order at about 9:05 AM. She started the meeting by having everyone introduce themselves. Since the minutes of the previous meeting had not yet been approved by email, which is the usual practice, they were approved, after noting a typo.

Discussion of Sources of Funding and Current Calls for Proposals

Dr. Scanlon began by mentioning that she heard that EPA's National Center for Environmental Research (NCER) through their Science to Achieve Results (STAR) program was proposing a new research center. The amount proposed for the new center would be about two and a half million dollars. The proposal is for creating two of these centers in the US. No one present had yet heard of this proposal. Dr. Scanlon resolved that she would investigate the matter more thoroughly and report back to the subcommittee at a later date.

Dr. Scanlon proposed that we discuss drought associated subjects as related to the upcoming legislative session. She envisioned the possibility of putting out some topics of interest. Mr. Betz pointed out the problem that the legislative focus will be on water quantity, because of the draught, while the subcommittee's area of interest is in groundwater quality. Dr. Scanlon proposed that perhaps conjunctive use could be an area of investigation. She said that at the BEG they were looking at the water use of power plants. She pointed out that often the water usage attributed to power plants is stated as the amount of water that they withdraw, from a stream for example, without acknowledging that 97% of this water is returned. In response to a question from Mr. Betz, Dr. Scanlon explained that there were three types of water cooling schemes for power plants: the open loop ones that withdraw water from a stream and then return the water after it's been used, those that use specifically built reservoirs for water withdrawal and return, and those that use water cooling towers. The first type, designated as open loop, uses the water only once while the second and third, designated as closed loop or recirculating, are similar in that they reuse the water after it has been cooled. The water supply for all of these comes 97% from surface water. Many of these have a "take or pay" contract or water right which means that they have to pay for the contracted amount of water even if they don't use it. This opens up the possibility of using something like aquifer storage and recovery (ASR) to store unneeded water in an aquifer to reduce the total amount of water that would need to be contracted and paid for. Dr. Scanlon went on to explain that one characteristic of power plants is that the life span of the power plant and much of its equipment is on the order of forty to fifty years. The result is that this makes it unfeasible, once a plant is built, to retrofit for the burning of a different fuel or to convert to a different cooling system. However, when a power plant reaches its end-of-life, it can be replaced with one more suitable to the prevailing fuel economics and technology. Dr. Scanlon gave a couple of examples of coal power plants which will be replaced with gas powered ones. She explained that the gas power plants usually have a couple of turbines directly powered by gas, which require very little water usage, while the third turbine is steam powered. They use about a third of the water of a typical power plant.

Mr. Betz, after this discussion, agreed that the use of ASR to economize water use at the power plants is a study area in which we would be interested. He mentioned the renewed interest in ASR in the state because of the draught conditions, and there is renewed interest at EPA in ASR as a consequence of them not being able to regulate ASR. Some ASR examples mentioned were the San Antonio project, which is

groundwater to groundwater, and the Kerrville project, which is surface water to groundwater. El Paso had an ASR project where they injected treated waste water, but they have discontinued the injection of this water and instead use it on golf courses and in other areas. Dr. Scanlon mentioned that the State Water Plan indicates that there has been a 30% reduction in per capita available storage from the 1980's, due to there being no new surface water reservoirs built since that time. She suggested that ASR could help in making up this deficiency. Mr. Betz asked whether TWDB was doing a study for the state determining in what areas ASR would be feasible. Dr. Scanlon responded that the study was not for the whole state, but that Mr. John Meyer at the TWDB was studying the geology in the Corpus Christi area to determine the feasibility ASR. Dr. Scanlon also informed the subcommittee that the TWDB funded the Malcolm Pirnie Report which addresses the reasons ASR has not been adopted more in Texas. Dr. Scanlon then pointed out that because of the loss of per capita storage since the 80's, and because there has been an increase in reservoir evaporation in recent years, due to the higher temperatures, that ASR should be receiving an increased consideration. Since the feasibility of an ASR project is completely dependent on geology, the quality of the injected water, and its compatibility with the receiving aquifer, Mr. Betz suggested that this makes it a prime area of research interest for this subcommittee. There was some discussion of the San Antonio situation where the propitious combination of having a high quality injection and a receiving aquifer having a sand matrix relatively insensitive to chemical incompatibility makes for a relatively ideal ASR project. Dr. Scanlon asked if perhaps city storm water could be used for ASR. Mr. Betz pointed out that storm water is water of the state and would need to be appropriated just like any surface water. He went on to explain that there were a couple of considerations. The first was determining whose water it is that's being considered for injection and what are the legal restrictions of injecting it into any particular aquifer. For instance, nothing can legally be injected into the Edwards Aquifer, but you can allow storm water to infiltrate into the Edwards through a natural sinkhole. The Edwards is the only aquifer that has this restriction; all other Texas aquifers are legally open to injection (with the proper permit). The other consideration is the physical and chemical suitability of the aquifer for injection. Mr. Betz gave the example of the Gulf Coast Aquifer when about twenty years ago the Harris Galveston Subsidence District was considering injection as a means of stopping subsidence. Eventually they determined that the idea would not work, because the dewatered clay lenses in the formation would not reabsorb any water. The conclusion is that a large portion of the Gulf Coast aquifers are unsuitable for ASR. That leaves us with aquifers such as the Carrizo, Trinity, Edwards-Trinity, Woodbine, etc. But, it's known that the Woodbine has chemical issues (iron and manganese), and it is not known how any particular injected water may exacerbate the chemical issues. Dr. Scanlon reiterated what seemed like the two most likely candidates for sources of injection water for ASR: storm water and treated waste water. She asked what would be most feasible for waste water, to treat it for ASR or to just reuse it directly. Mr. Betz informed us that when you use waste water for ASR the chemical issues are compounded. This is because, in the treatment process, the water is usually heavily oxygenated and then in the last phase of treatment it is treated with a disinfectant. According to EPA, disinfectant byproducts are the most serious contaminant concern

with ASR projects. If you inject water with a chlorine residual into an aquifer and an organic carbon compound is present, then you're sure to get an organic disinfectant byproduct.

Dr. Scanlon brought the subject back to the possibility of scalping flood flows for ASR. Mr. Betz responded that there was a lot of interest in that, but that there was the legal requirement to meet environmental flows. Mr. Betz said that he wasn't sure exactly how to meet the requirements, how and where a diversion point would be placed, and how it would be managed. Mr. Egg brought up LCRA's plan for off channel reservoirs. He pointed out that an ASR project would be very similar, except that it would involve injection. Dr. Scanlon mentioned that LCRA had the water rights to operate the off channel reservoirs. There would be a water rights requirement for harvesting flood flows which are thus far usually unappropriated. It was also pointed out that a flood water ASR project would require interim storage to hold the water until it could be injected. Mr. Betz mentioned a proposal for an ASR project near San Antonio which would involve building approximately a seven acre impoundment into the Glen Rose limestone. The bottom of the impoundment would be in contact with the Glen Rose such that only natural infiltration would be needed for the injection. The water would move into the Glen Rose and then on into the Edwards Aquifer. Scalped flood water would be used to feed the impoundment. However, some problems with the project remain. One problem is that the steam segment in the area is over appropriated. Also, it has not yet been determined if this would constitute an injection into the Edwards. Furthermore, at this point they haven't yet completely gone through the design process. It remains to be determined if the water will be compatible with Edwards water and how much water will ultimately end up in the Edwards. Until all this is accomplished they will not be able to get their water rights permit resolved.

Dr. Scanlon suggested that some types of ASR projects might be appropriate more for smaller cities. A project like the City of Kerrville has might be something for smaller communities to consider. She suggested that we might be able to develop a two-pager white paper that would outline some of the things that a community would need to consider. Technologies such as desalination and ASR are becoming available, but how does a community decide what would actually be feasible to expand their water supply. Ms. Hopkins pointed out that the City of Kerrville is relatively well off economically, compared to most cities, which may be a major reason why they were able to undertake their ASR project. She observed that the communities that are now in trouble because of the draught have no money. Dr. Scanlon suggested that maybe public/private partnerships would be the answer. Mr. Betz observed that another factor contributing to Kerrville's ability of carrying out their ASR project was their good fortune of having the perfect combination of geology, river water availability, and infrastructure. Of course their ASR project wasn't a panacea; they are still facing a water shortage. The project provided them with temporary relief, but now they are still looking for additional water supplies. They are not able to get any more surface water rights for their ASR and there isn't any more water in the river, anyway. Mr. Egg pointed out that many of the small communities across the state are totally on groundwater now; where would they

get any surface water? Ms. Hopkins observed that perhaps because of this, Brown County has a project to do direct reuse of their water. The TWDB just recently funded their project. Mr. Betz observed that at this time there was much more interest in reuse than ASR, although ASR is still being considered “on a big-picture scale.” Dr. Scanlon brought up desalination as a possible solution but also pointed out its great expense. Mr. Betz countered that the building and maintenance of a proper ASR project was also expensive. Most small communities wouldn’t have the tax base or rate infrastructure to support an ASR project (or desalination). Dr. Scanlon then asked, “so, what are the options for these small communities?” Mr. Egg responded that one common method of obtaining relief to a community’s water supply shortage was to install interconnects with other communities. Ms. Hopkins stated that that was what the TWDB was promoting, interconnections. She also went on to state that much of West Texas was in big trouble because of water shortages. Dr. Scanlon jokingly suggested that maybe perhaps we need a big-pipe system to transport water from East Texas to West Texas so that they would have some water to store. Dr. Scanlon clarified that these small communities wouldn’t be able to afford desalination either. Ms. Hopkins pointed out that in these small communities most of the children when they grow up move away to the bigger cities, that their populations are usually shrinking.

Dr. Scanlon asked Mr. Betz if he thought that we could write up a white paper on ASR or if there were legal issues that the Legislature would need to address to facilitate ASR projects. Mr. Betz responded that they could further consider the possibility, and Dr. Scanlon agreed that she would be willing to follow-up with Mr. Betz on the subject.

Mr. Egg brought up the question of who would own the water in an ASR project where surface water with clear ownership is injected into the groundwater where it can become the property of whoever pumps it out. Illustrating his point, Dr. Scanlon brought up the example of the Bexar Metropolitan Water District (BexarMet) which was right across the street from the San Antonio Water System (SAWS) which had an ASR project. However, the problem in this case was solved since BexarMet was merged into SAWS. It was agreed that there were many of these types of issues that often need to be solved, and Mr. Egg suggested that perhaps it would be a good idea to try to identify all the possible issues and create a type of checklist.

Dr. Scanlon reiterated that there were those occasional flood flows which could be harvested, if you have some means of providing interim storage, and injected into an aquifer. She then asked if anyone had anything else they wanted to bring up concerning the upcoming legislative session or the drought. Mr. Egg brought up another water quality issue concerning habitats for the endangered salamanders, in Salado, Jollyville, Georgetown, and a couple of other places. He mentioned that apparently there wasn’t a lot known about the flow in that northern part of the Edwards Aquifer including the identification of the actual points of recharge. Apparently, the critical factor for the salamander is the water quality. Knowing where the recharge points are would indicate where the protection of this part of the aquifer could be focused. Mr. Betz commented that the way the Fish & Wildlife Rule is set up was to create critical habitat areas based

on the footprint of the karst area in which the endangered species were found. These habitat areas extend only a small area outside of the cavern or the karst feature. However, the developers in Williamson County are complaining about these designations saying that this is taking away the use of their property. Mr. Betz opined that these designations might be leading up to an Edwards Aquifer Authority (EAA) type of law suit. So, it might be rather difficult to get agency management to agree to delineate the sensitive areas.

Dr. Scanlon asked if anyone knew more about something that she heard, the possibility that there might be a multi species listing of endangered species, an expansion beyond the single species listing. Mr. Betz replied that the Barton Springs salamander is already listed, but there is a second salamander that they are proposing for listing. However, it involves the same identical habitat, so that in theory one would think that whatever is good for the Barton Springs salamander would also apply to this second salamander. Another point is that they are going beyond just visual inspection in the identification of separate species. Even though two salamanders may look identical, if they have a slightly different DNA, they will be considered separate species. Dr. Scanlon mentioned that Dr. Brad D. Wolaver of the BEG research staff did a study looking at the potential listing of mussels and what the resultant economic impacts would be. She went on to point out that the Voluntary Irrigation Suspension Program Option (VISPO), where irrigators are paid by the acre-foot not to pump water from the Edwards Aquifer for irrigation, would provide some relief for other uses such as for power plants or for the protection of mussels. Mr. Betz pointed out that this type of scheme would only work under the right circumstances. It works for the San Antonio segment of the Edwards Aquifer, but in the north Edwards where there is little irrigation this type of system wouldn't work.

Dr. Scanlon asked Mr. Betz if he was current on the Environmental Flows Program. Mr. Betz affirmed that he was somewhat familiar with the program and knew that environmental flow standards for several streams had gone before the Commission for approval. His information was, where necessary, water rights on a stream will be somewhat reduced to provide for the required environmental flow. Mr. Egg said that his understanding was that a work group or committee would make the technical determination as to how much environmental flow is needed for a stream, and TCEQ, being responsible for the water rights, would make the final decision as to how much water right would actually be needed. Dr. Scanlon commented that it would be nice to know what all the impacts are on a stream including the environmental flow impact. Mr. Egg suggested that this information and analysis would probably be incorporated into the next water plan.

Dr. Scanlon went on to the subject of the production of shale gas and the fracking process; she asked if anyone had any information in this area. Mr. Egg offered that the volume of water used in fracking is not that great when considered in the larger scheme of things, but that there certainly are some local issues. Mr. Betz added that the fracking industry is at the forefront of water reuse. In South Texas there is some difficulty for the frackers to obtain the water that they need, and they have been working cooperatively

with the groundwater conservation districts, even though the districts do not have jurisdiction unless the frackers want to bring in water from offsite wells. The frackers have developed portable units that treat water onsite. The treated water is stored in a lined pond from which it is used in the fracking operation. And, with this technology, they can reuse the water. Dr. Scanlon asked Mr. Betz if there were a lot of issues with fracking coming to the TCEQ's attention. Mr. Betz responded that everyone is talking about fracking, but the concern is not so much about the fracking itself, but with things like not being able to get a hotel room, the truck traffic, etc. He explained that the TCEQ, when fracking first started up in the Dallas area, in Parker County, etc., received a lot of calls from people expressing concerns about the depletion of groundwater, or the diminishment of groundwater quality in the area; but as these fracking operations proliferated the agency heard less and less about water. The concern turned more and more towards the possible effects on air quality. However, when fracking became more common in South Texas, the TCEQ was rather surprised that the people in the area were not so much concerned with the air emissions as with groundwater. Fortunately, no major issues have developed with groundwater. Dr. Scanlon pointed out that in South Texas the frackers could probably acquire water from the agricultural producers that irrigate, since there is a fair amount of irrigation in some of the areas. Ms. Hopkins interjected that one of the TWDB Board members had recently asked why one of their groundwater recorders in La Salle County had shown such a drastic decline in water levels. In response some of the staff of the TWDB gathered some information and put together a little report. They determined that there had not been any unusual pumpage in the area, that there had been a significant long term sharp decline in the well – a 60-foot drop in water level over the last eight years – and that an increase in irrigation due to the drought was most likely the cause of the more recent accelerated water level decline. The point was that under these conditions it would be very difficult to blame the water used for fracking for any groundwater level declines in the area. Ms. Hopkins also mentioned that there was a question about an artesian well in Karnes County in which the water level had considerably declined, to five feet below land surface. The local newspaper had blamed the decline on fracking. Here again it would be impossible to blame this decline on fracking, the drought having a much more far reaching effect. Mr. Betz added that when the TCEQ had done the Carrizo study, in the South Texas area in question -- which consulted the Texas Water Plan, all the regional water plans in the area, and groundwater models -- it was determined that there was already a significant water problem in this area, before the commencement of fracking. It was determined that the water problem in the area probably had very little to do with fracking which accounts for only a very miniscule portion of the water being used in the area. As a side note, it was pointed out that there had been an increase in the use of municipal water in the area due to the large influx of people working on the fracking crews.

Dr. Scanlon mentioned that Midland, Texas was receiving some water from the Canadian River Municipal Water Authority (CRMWA). Mr. Egg added that Midland and San Angelo were putting in well fields to draw water from the Pecos Alluvium. Ms. Hopkins added that they were getting good flows from the wells and that the water was of fairly good quality. Mr. Egg added that all the major cities in the area, Odessa,

Midland, and San Angelo, had pipeline interconnects. Mr. Betz added that piping is a cost effective alternative to provide some measure of water supply security. He gave an example of the Los Angeles aqueduct in California which was built in the fifties. It was a cost effective proposition even back then, even though it was an expensive project. Dr. Scanlon mentioned that desalination could be an alternative in the Midland area, drawing brackish water from the Dockum. But desalination would probably be even more expensive than any of the other alternatives. She mentioned that the Australians, because of economics, are putting all their desalination plants into mothballs.

Summing up, Dr. Scanlon stated that Mr. Betz and she would be following-up on ASR. As a last note she asked Ms. Hopkins how many wells the TWDB had fitted with automatic recorders. Ms. Hopkins responded, 170, and added that some of the districts with money had recorder equipped wells. Kerrville had close to ten, and the Panhandle had ten or eleven wells equipped with recorders. The data from the wells can be accessed from the TWDB website; the whole time series are available online.

Public Comment

There was no public comment.

Adjournment

The meeting adjourned at 10:02 AM.

Minutes prepared by Joseph L. Peters, February 27, 2013

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