

From: Daniel Nix
Sent: Mon, 22 Jun 2015 14:06:14 -0500
To: da Silva, Allegra K.
Cc: Crawford, Susan
Subject: Re: FW: Wichita Falls IPR and DPR Case Study
Attachments: A6 WichitaFallsCaseStudy.docx, MF_RO Clarifier.png, 20140926_084734.jpg, ro001.jpg

Allegra,

I have gone through your Case Study and have added my comments. (Attached)
It looks good.
I have also attached a couple of photographs of the DPR processes/plant.
Let me know if you need anything else.

On Fri, Jun 19, 2015 at 9:25 PM, da Silva, Allegra K. <dasilvaak@cdmsmith.com> wrote:

Dear Daniel,

Attached is the reworked case study on Wichita Falls for the EPA potable reuse supplement to the 2012 Guidelines for Water Reuse. See what you think. Did I get it mostly right?

I'd love for you to go through it carefully and make sure I captured everything that you told me over the phone accurately. Feel free to edit it as you see fit. I turned track changes on so that I could see what you change, but if that drives you nuts, feel free to turn it off. Also, do you think we could add in a photo of one of those t-shirts from Wichita Falls ("Wee Recycle" and "We put No. 2 in H2O" from your presentation in Denver). I LOVE those pictures. Also, where do I get one of those shirts?! Google is coming up dry.

I'll touch base with you in a few weeks to see what you think. And I'll see you in Lubbock!

Allegra

From: Daniel Nix [mailto:daniel.nix@wichitafallstx.gov]
Sent: Friday, March 13, 2015 8:37 AM
To: da Silva, Allegra K.

Subject: Re: FW: Wichita Falls IPR and DPR Case Study

Allegra,

Here are the small files. I will be sending another e-mail with the PP presentation (in PDF) format, because it is so large.

I have included; the 45-day Full Scale Verification (FSV1) sampling protocol, the 30-day Full Scale Verification (FSV2) protocol, and an updated Flow Diagram of the DPR as it is configured now. I do not have an IPR flow diagram, but you can probably get that from Susan Crawford.

Let me know if you need anything else.

On Thu, Mar 12, 2015 at 9:17 PM, da Silva, Allegra K. <dasilvaak@cdmsmith.com> wrote:

Dear Daniel,

Thank you very much for taking the time today to talk with me about the regulatory history there for the DPR and IPR projects in Wichita Falls. I truly enjoyed chatting – I hope I get to meet you in person one of these days. I'll send you a revised draft in about two weeks for your review.

If you have time tomorrow before you head on vacation, could you please send me:

- The table of monitoring requirements for the 45 day demonstration (as well as for the 30 day demonstration, if possible)
- The more recent PowerPoint presentation that you mentioned (I think you said you gave it at the North Central Chapter of the AWWA)
- Any image (if available) of the DPR and IPR process streams (comparing the treatment)

I hope you have a great trip to California!

Again, thanks very much!

Allegra

From: da Silva, Allegra K.
Sent: Thursday, March 12, 2015 12:11 PM
To: 'Daniel Nix'
Subject: RE: FW: Wichita Falls IPR and DPR Case Study

Hello Daniel,

For our call at 1:30pm today, would you like me to call your office number, 940-691-1153?

Thank you very much,

Allegra

From: da Silva, Allegra K.
Sent: Tuesday, March 10, 2015 12:26 PM
To: 'Daniel Nix'; Crawford, Susan
Cc: Russell Schreiber; Vandegrift, Jillian C.
Subject: RE: FW: Wichita Falls IPR and DPR Case Study

Hello Daniel,

Let's talk on Thursday at 1:30pm Central Time. I'll be calling you from Denver. Would you like me to call your office number, 940-691-1153?

Thank you very much,

Allegra

From: Daniel Nix [<mailto:daniel.nix@wichitafallstx.gov>]
Sent: Tuesday, March 10, 2015 7:13 AM

To: Crawford, Susan
Cc: Russell Schreiber; Vandegrift, Jillian C.; da Silva, Allegra K.
Subject: Re: FW: Wichita Falls IPR and DPR Case Study

Susan,

That should work. I am available Thursday between 1:30 and 3:00. And ten on Friday from 8:30 to 11:00, and all Friday afternoon.

On Mon, Mar 9, 2015 at 4:22 PM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:

Thanks Daniel! These comments are very helpful. One question for you, on the highlighted item below, could we call you this week and get a feel for how you would like the regulatory discussion handled? We could talk on the phone and then write something up for you to review. Would that work?

Regards,

Susan L. Crawford, PE, BCEE | Senior Vice President
CDM Smith | 8140 Walnut Hill Lane, Suite 1000 | Dallas, Texas 75231
Office: 214-346-2800 | Cell: 214-334-1101

From: Daniel Nix [mailto:daniel.nix@wichitafallstx.gov]
Sent: Monday, March 09, 2015 8:57 AM
To: Crawford, Susan
Cc: Russell Schreiber; Vandegrift, Jillian C.; da Silva, Allegra K.
Subject: Re: FW: Wichita Falls IPR and DPR Case Study

Susan,

The case study is accurate and I only have a few minor changes.

Water conservation methods were practiced in a staged format and saved up to 2 BG of water, however were not significant enough to sustain a reliable drinking water supply (Nix, 2013)

We actually saved 2 BG in one of our stages. All Total, through all 5 stages, we have saved 6.1 BG, at the end of December 2014. At our current usage, that is about 1.5 years worth of water.

Since there are no regulatory guidelines for DPR in Texas (or in any other state), TCEQ and the City of Wichita Falls Public Works Department collaboratively discussed the necessary treatment requirements and effluent limitations.

I think this could be elaborated upon, since it took so much time and the project hinged on it.

The system transfers treated effluent from River Road WWTP to Cypress WTP where MF and RO processes occur, followed by holding in an engineered storage buffer for 24 hours and subsequent blending with Lake Arrowhead surface water, constituting 50% of the total blended water volume.

The system transfers treated effluent from River Road WWTP to Cypress WTP where it is treated by MF and RO. The RO permeate is then blended at a 1:1 ratio with raw, untreated lake water and subsequently treated through a conventional water treatment plant, followed by holding in an engineered storage buffer for 24 hours before being discharged to the Distribution System.

This process creates an additional 5 MGD (33% of daily demand) of municipal drinking water.

It can be as high as 50% of the daily demand in the winter.

DPR: WWTP→WTP (MF→RO)→Holding Lagoon (Engineered Storage Buffer)→Blending 50-50→Conventional Water Treatment Plant (Chlorine dioxide pre-disinfection, coagulation, lime softening, sedimentation, re-stabilization, gravity media filtration, fluoridation).

DPR: WWTP (with Chloramine disinfectant down the pipeline)→WTP (MF→RO)→Holding Lagoon →Blending 50-50→Conventional Water Treatment Plant (Chlorine dioxide pre-disinfection, Chloramines primary disinfection, coagulation, lime softening, sedimentation, re-stabilization, gravity media filtration, fluoridation, Chloramines terminal disinfection) and Storage (Engineered Storage Buffer).

The DPR process is required to achieve 9-log virus removal, 7-log Giardia removal, and 5.5-log Cryptosporidium removal as specified by TCEQ.

These were based on the log removal charts in the SWTR, and rather than using a 24 month (sample) average the max cysts concentrations were used to determine log removal. We started with 8-log Virus, but was increased to 9-log because the Chloramines were pre-forming at the wastewater Plant was Ammonia first and then Chlorine. TCEQ felt that we would not get any of the extra benefit of Chlorine (free) first, so they went up a log. The Giardia was originally 6-log, but was increased due to new max cyst level being found on our continued monitoring of the effluent.

TCEQ does not give log-removal credits for the reverse osmosis process during DPR treatment with respect to the microbial log-removal requirements.

Because Daily Integrity testing of the RO elements is not possible.

TCEQ requires both bi-weekly and daily monitoring of Cryptosporidium utilizing two different methods

The PCR method did not work. It was only used during the Verification Testing to try the new method. Therefore, the PCR was removed from the monitoring requirements.

On Mon, Feb 9, 2015 at 10:29 AM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:

Daniel,

Here's the draft write-up for the Wichita Falls case study that will go in the EPA DPR document we are preparing as part of our contract with them. You will note that there is no discussion currently about the UV system. We left that out so that you add this as you see fit. This document is really your story to tell others, so you can edit it to add more information if you like and as you see fit to be accurate.

Most of the information provided here is from public documents and your previous presentations. If you want to use track changes to edit, that would be great!

Let me know how I can help or answer any questions you may have. We'd like to get this back from you next week if possible.

Regards,

Susan L. Crawford, PE, BCEE | Senior Vice President

CDM Smith | 8140 Walnut Hill Lane, Suite 1000 | Dallas, Texas 75231

Office: 214-346-2800 | Cell: 214-334-1101

From: Vandegrift, Jillian C.

Sent: Friday, February 06, 2015 3:47 PM

To: Crawford, Susan

Cc: da Silva, Allegra K.; Bell, Kati

Subject: RE: Wichita Falls IPR and DPR Case Study

Hi Susan,

Here is the final version of the write up with your edits incorporated. Thanks!

Jill C. Vandegrift |Environmental Engineer| CDM Smith

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Denver, CO 80202

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Those who have the privilege to know have the duty to act. ~Albert Einstein

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A.6 Wichita Falls

River Road WWTP and Cypress WTP Permanent IPR and Emergency DPR Project

Project Facts

Location

Wichita Falls, Texas

Size

DPR: 5 MGD IPR: 16 MGD

Year of Installation

DPR: 2014 IPR: TBD

Status

DPR: Operational IPR: Planning Stages

Cost

DPR: \$13 Million IPR: Projected \$33.5 Million

Background

Lake Arrowhead and Lake Kickapoo are the main surface water supplies for the City of Wichita Falls, Texas. During 2013, both lakes were less than 35% full (Figure A.6-1) sending Wichita Falls into extreme drought conditions with no readily available water supply solution (Khan, 2013). By May 2014, Wichita Falls declared a Stage 5 drought catastrophe with a total combined reservoir capacity in the region of 20% (TRNS, 2015).

Wichita Falls, however, proactively began investigating wastewater reuse following the drought of 1995-2000 during which they supplemented their drinking water supply with highly saline water from Lake Kemp and Lake Diversion (Dahl, 2014). By using microfiltration and RO, they were able to integrate the treated saline lake water with the existing potable water supply. Wichita Falls Public Works Department was confident they could do the same with municipal wastewater when faced with the most recent drought conditions. In 2012, recognizing the City would be out of water by 2014 without further action, the City drafted a two-phase project plan involving both a permanent IPR scheme and an emergency temporary DPR scheme.

Conservation efforts

By December 2014, staged water conservation efforts saved up to 6.1 BG of water (about 1.5 years' supply), but were not sufficient to sustain a reliable drinking water supply (Nix, 2013).

Emergency (short-term) DPR system

The DPR scheme was implemented because drought conditions led to severe and abrupt drinking water needs for the City of Wichita Falls. The emergency DPR project began operating online on July 9, 2014 after only 27 months of design, permitting, and construction duration. The city expects the temporary DPR system to remain in operation for 2 – 2.5 years, at which time the permanent IPR system will come online.

The system transfers treated effluent from River Road WWTP to Cypress WTP through 13 miles of pipe that were laid in 3 months – all above ground (Figure A.6-2). The pipeline was sized for the future permanent IPR system and will be reused. By laying the pipeline through the city's flood control channels, the city did not face any right of way issues.

At the Cypress WTP, the treated effluent is further purified through MF and RO. The RO permeate is then blended at a 1:1 ratio with raw, untreated Lake Arrowhead water, and subsequently treated at a conventional WTP, followed by holding in an engineered storage buffer for 24 hours before being sent to the distribution system. The process creates an additional 5 MGD (up to 50% of daily demand) of municipal drinking water. 2.5 MGD of brine from the MF and RO processes is discharged to the Big Wichita River (Nix, 2013).

Permanent (long-term) IPR system

The IPR project will utilize the existing 12-mile pipeline constructed for the DPR project to complete the 15-mile pipeline from River Road WWTP to Lake Arrowhead. The City has received a new discharge permit from TCEQ for the permanent IPR installation. The IPR project will ultimately pipe up to 16 MGD of highly purified effluent from River Road WWTP back to Lake

Commented [dSAK1]: Daniel, can we list you as the author of this case study? You can also add co-authors if you wish!

Commented [ND2R1]: Allegra, yes you can list me as a co-author. You might list Russell Schreiber, as well.

Commented [ND5]: It might be beneficial to state here that the Stage 5 drought restrictions had lowered the average summer usage by 65%.

Commented [ND3]: You might list this as "by 2018"

Commented [ND6]: Do you want to say anything here about us using the existing Lake Kemp MF/RO Plant? That kept the cost and time down, because we didn't have to build a membrane plant. We were going to have to mothball the MF/RO plant anyway, because Kemp water had gotten to brackish (had gone from the normal 2500 ppm TDS to 8000 ppm), so why not use it for the lower TDS (850 ppm) wastewater effluent.

Commented [ND7]: May want to add UV, here.

Commented [ND8]: Under the existing discharge permit that was acquired for the Lake Kemp operation.

Commented [dSAK4]: Daniel, is this timing correct?

Commented [dSAK9]: Daniel, above we say 13 miles of pipe. Is it 12 or 13?

Arrowhead, which will serve as an environmental buffer, before the water is treated at the city's conventional WTPs and distributed to customers. River Road WWTP will be retrofitted with a new phosphorous reduction process, tertiary filtration processes and a new pump station using loan money to fund the upgrades (Ingle, 2014).

Treatment Process

DPR

WWTP → Pipeline (including chloramine disinfectant down the pipeline) → WTP (MF→RO) → Holding Lagoon (Engineered Storage Buffer) → Blending 50-50 → Conventional WTP (Chlorine dioxide pre-disinfection, chloramine primary disinfection, coagulation, lime softening, sedimentation, restabilization, gravity media filtration, fluoridation, chloramine terminal disinfection) → Storage (engineered storage buffer) (Figure A.6-3)

IPR

River Road WWTP (upgrades will include chemical phosphorus reduction with filters and new re-aeration) → Effluent Pump station and pipeline → Lake Arrowhead (environmental storage buffer) → Conventional WTP

Collaboration between TCEQ and City

Although there are no IPR or DPR regulations currently implemented in Texas, TCEQ reviews submitted project proposals individually and grants approval and discharge permits on a case-by-case basis. TCEQ approved the Wichita Falls DPR scheme after reviewing the DPR project proposal and the proposed long-term IPR system solution. Since there are no regulatory guidelines for DPR in Texas (or in any other state), TCEQ and the City of Wichita Falls Public Works Department collaboratively discussed the necessary treatment requirements and effluent limitations.

DPR Permitting Process

The city worked with TCEQ for the first 9 months of 2013 to discuss how to operate the plant and received the approval to build the pipeline towards the end of 2013. Following the completion of the DPR system installation in December 2013, TCEQ worked with the city on carrying out an intense 45-day testing period, followed by 30 additional days of testing. During this full-scale verification testing, TCEQ staff spent time onsite understanding how the plant was operating and

observing the lab operations. Based on the results from these full-scale verification test periods, TCEQ approved a permit on June 28, 2014 which allowed six months of operation. TCEQ has subsequently extended the permit based on excellent operation but required the addition of UV after the initial six months of operation.

DPR Microbial Log Removal Requirements

TCEQ used the Surface Water Treatment Rule (SWTR) as the basis for assigning log removal requirements. However, to be more conservative than required by the SWTR, rather than using a 24-sample average concentration as the basis for assigning log removal requirements for Giardia and Cryptosporidium, they took the maximum concentration ever observed.

The DPR process is required to achieve 9-log virus removal, 7-log Giardia removal, and 5.5-log Cryptosporidium removal as specified by TCEQ. Initially, TCEQ had required 8-log virus removal but increased it to 9-log because chloramines were preforming at the wastewater plant and therefore TCEQ felt that there would not be as much free chlorine disinfection occurring. Likewise, TCEQ initially required a lower Cryptosporidium removal target (6-log) but increased it to 7-log removal required after continuous effluent monitoring indicated higher concentrations of Cryptosporidium could be present in the raw wastewater than the maximum concentration observed previously. These adjustments show the adaptability on the part of TCEQ to changing conditions and the open communication between the regulators and the City with the common goal of protecting public health.

Because daily integrity testing of the RO elements is not possible, TCEQ does not give microbial log-removal credits for the DPR RO elements. As a result, other employed treatment methods must successfully achieve the log removal requirements.

IPR Permitting Process

TCEQ approved the permit for the IPR system in Fall of 2014 which allowed the city to go forward with design. The system is funded with a \$33.5 million loan through the Texas Water Development Board and the Clean Water Act State Revolving Fund. The city is in the midst of a required archaeological investigation along the pipeline route and the design process and expects to have the permanent IPR system online and upgrades to the River Road WWTP complete by 2017.

Commented [dSAK15]: Daniel, did I get this right?

Commented [ND16R15]: Yes.

Commented [dSAK10]: Daniel, do you have an image of the IPR or DPR systems to include? Perhaps a shot of the RO setup?

Commented [ND11R10]: Yes. I will transmit with these comments.

Commented [ND12]: Add UV here

Commented [ND13]: We actually stopped lime softening and was only using the lime for pH control.

Commented [ND14]: Not needed since we stopped softening

Commented [ND17]: 8-log for Giardia

Commented [ND18]: Giardia

Commented [ND19]: 8-log

Commented [ND20]: Giardia

Commented [dSAK21]: Daniel, did I get this part correct?

Commented [ND22R21]: Corrections are noted below.

Commented [dSAK23]: Daniel, is this correct & up to date?

Monitoring

The city worked with TCEQ in a collaborative process to decide upon 42 monitoring locations and requirements within the DPR System to ensure public health is protected and off-speculation drinking water is prohibited from entering the distribution system (**Figure A.6-3**). The range of chemical and microbial constituents required for monitoring of the temporary DPR scheme are similar to the current Safe Drinking Water Act (SDWA) requirements. Constituents in the SDWA are monitored in the wastewater effluent, RO permeate before blending, lake water, and at the end of the conventional WTP.

TCEQ requires both bi-weekly and daily monitoring of Cryptosporidium utilizing EPA method 1623. A PCR based method was also tried for Cryptosporidium during verification testing but was not suitable and was removed from the monitoring requirements. Other monitoring parameters include Giardia; *E. coli*; total culturable viruses; full metal scans; algae counts; inorganic, organic, radioactive, and secondary chemicals specified under Texas drinking water codes; and disinfection byproducts. Other unregulated trace chemical constituents are not monitored since the DPR installation is intended to be temporary.

The city monitors unit processes to ensure that the required microbial log removals are being met. For example, every eight hours, log removal credits for each disinfection zone is calculated based on disinfectant concentration and contact time. The log removal values are entered into a table with values from other unit processes and an overall observed log removal is tabulated. The DPR process is regularly providing 25-log removal for viruses and 16-log removal for Giardia (compared to the 9- and 7-log removal requirements, respectively).

Operator certification

The City of Wichita Falls has historically produced high-quality drinking water, and pride themselves on the certification system with respect to plant operators. Wichita Falls plant operators must be certified by the State of Texas and continue training throughout their career lifetime. They can achieve certification levels A through D, A being the highest achievable level. Operators must be recertified every three years (City of Wichita Falls, 2014). In total, the City of Wichita Falls has five class A operators, 19 class B operators, and 11 class C operators (City of Wichita Falls, 2014).

Collaboration between the County Public Health Department and the City's Public Works Department

The city had an existing local water quality task force that was established in 1997 in response to the Milwaukee Cryptosporidium outbreak. The task force is made up of members of the City's Public Works Department and the City/County Public Health Department. The task force has met regularly and has established protocols for what action and communication is required in the case of unexpected process upsets or disease outbreaks observed in the population. TCEQ has attended one of the task force meetings to observe how information and data are exchanged. This relationship is unique and helps to guarantee public health safety.

Leadership

The Director of the City's Public Works Department and the Utilities Operations Manager both feel they put their careers on the line to be out front with DPR. However, they also feel that there was nothing innovative technically – all of the components had been previously studied for four decades or more. Wichita Falls simply did extensive research to assemble and digest published literature from the U.S., Australia, Europe, and Japan, and then put the pieces together.

Public outreach

Public outreach techniques were used to educate doctors and professors of environmental science and chemistry and the general public (Dahl, 2014). Ensuring the community was comfortable with the potable reuse concept immensely helped the projects evolution. The leadership of the Public Works Department feels that the DPR and IPR projects have been 100% transparent with the citizens and that they could not have succeeded without the support of the community.

Public perception

To date, city and state officials have not received any complaint calls regarding taste. In fact, some residents feel the water tastes better since the DPR scheme was brought online and the city expects there may be taste complaints when switching to IPR since the water will be mixed with Lake Arrowhead water which typically has a muddy taste.

The Public Works Department monitored bottled water sales at the three large Walmart retailers in town. Water

Commented [dSAK24]: Daniel, is it daily monitoring now that PCR has been removed from the testing?

Commented [ND25R24]: It is bi-weekly for Viruses, Giardia and Cryptosporidium. The Daily analysis is for *E. coli*.

Commented [dSAK26]: Daniel, can you explain why?

Commented [ND27R26]: The PCR methods that were evaluated were for both Giardia and Cryptosporidium. The reason that it was deemed unsuitable was that the PCR data did not correlate with the EPA Method 1623 data.

Commented [dSAK33]: Daniel, what do you think about this section?

Commented [ND34R33]: I like it.

Commented [dSAK28]: Daniel, are you comfortable with including this or should we take it out? Do you want to add something like "and therefore potential public health risks due to exposure of trace chemicals is likely to be exceedingly low." (or does that sound too speculative even though it makes perfect sense to those of us that understand the concentrations of CECs we're observing in wastewater?)

Commented [ND29R28]: This is a touchy subject. It is probably best to leave it out, or simply state that monitoring only occurred for constituents that had existing regulations that were based on existing scientific data.

Commented [dSAK30]: Daniel, did I get this part correct?

Commented [ND31R30]: Yes.

Commented [ND32]: Since there are no regulations regarding Operator Certification for Reuse, we did a couple of extra things with our Operators. First, we required the Water Operators to tour the Wastewater Plant, so they would understand the WW processes and what they were trying to remove. We did the same thing with the Wastewater Operators. Second, we required the Water Operators to take a Basic WW, WW Treatment and Waterborne Pathogens class. The WW Operators had to take Basic Water, Surface Water and Waterborne Pathogens.

bottle sales increased by about 9% after DPR was brought online, indicating that some residents may have switched from tap water to bottled water for drinking, but that the majority of the population has not begun buying bottled water.

City residents have embraced their place in history as a leader in DPR (**Figure A.6-4**).

References

Dahl, R. (2014). Advanced Thinking: Potable Reuse Strategies Gain Traction. *Environmental Health Perspective*. 122(12): A332–A335. Published online Dec 1, 2014. doi: 10.1289/ehp.122-A332

City of Wichita Falls. 'Wichita Falls Direct Potable Reuse Project: Complete Detail'. Retrieved December 2014 from <http://www.wichitafallstx.gov/DocumentCenter/View/21987>

City of Wichita Falls. 'Wichita Falls Direct Potable Reuse Project: FAQ'. Retrieved December 2014 from <https://www.youtube.com/watch?v=PrbH2BeDfg&feature=youtu.be>

Ingle, John (2014). 'Water board approves Wichita Falls loan'. *Wichita Falls Times Record News*. Retrieved January 2015 from http://www.timesrecordnews.com/news/water-board-approves-wichita-falls-loan_82555414

Khan, S. (2013) Drinking Water Through Recycling: The Benefits and Costs of Supplying Direct to the Distribution System, Report of the Australian Academy of Technological Sciences and Engineering, funded by the Australian Water Recycling Centre of Excellence through the Commonwealth Government's Water for the Future initiative.

Nix, D. (2013). 'City of Wichita Falls Water Conservation and Emergency Direct Potable Reuse'. Powerpoint Presentation at North Central Texas American Water Works Association Meeting.

Times Record News Staff (TNRS). (2015). 'Water dominates 2014 headlines'. *Wichita Falls Times Record News*. Retrieved January 2015 from http://www.timesrecordnews.com/news/local-news/water-dominates-2014-headlines_99148865

Commented [dSAK35]: Daniel, could we include one or two goofy t-shirt photos? Did you take any of the photos yourself or would we have to get permission from someone to include them?



Figure A.6-1 Lake Arrowhead Levels in 2013 (Photo credit: ~~XX~~)

Commented [dSAK36]: Daniel, who should the photo credit go to?

Commented [ND37R36]: This photograph was taken by me.



Figure A.6-2 Temporary DPR Pipeline Installation (Photo credit: ~~XX~~)

Commented [dSAK38]: Daniel, who should the photo credit go to?

Commented [ND39R38]: I don't know.

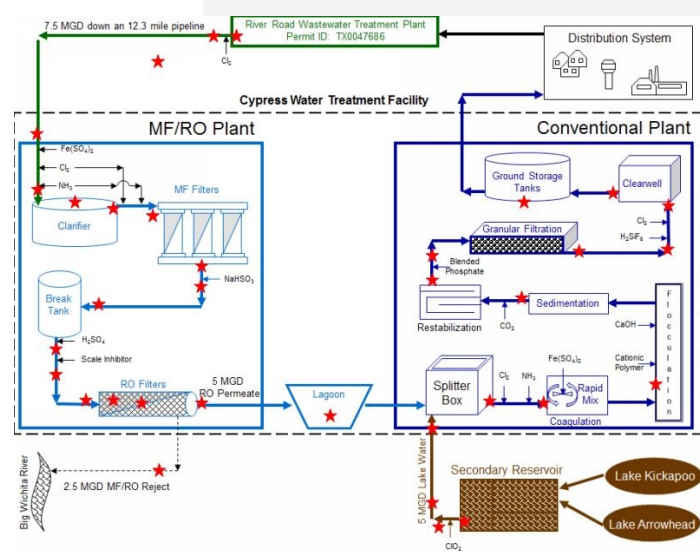
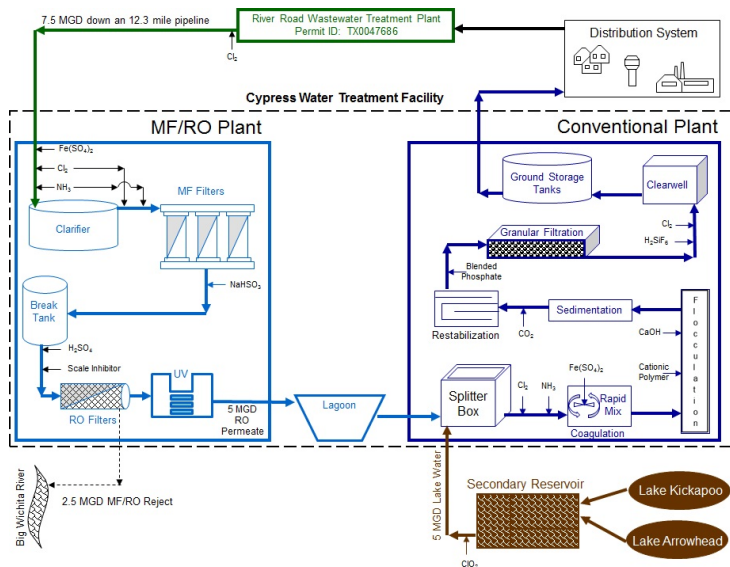


Figure A.6-3: Process Flow Diagram of Emergency DPR Project. (Stars indicate water quality monitoring locations.)

Commented [dSAK40]: Jill, please put all the red stars on the figure which includes UV (more up to date).

Figure A.6-4: T-shirts sold in Wichita Falls touting DPR. (Photo credit: XX)

Commented [dSAK41]: Daniel, do you have a picture or two to include? I'm thinking of one or two that you showed at the DPR workshop in Denver a few weeks ago.





