

From: Russell Schreiber
Sent: Wed, 13 Mar 2013 15:42:19 -0500
To: Crawford, Susan
Cc: tdh@cpbwf.com; Daniel Nix
Subject: Re: Presentation
Attachments: Wichita Falls longterm Reuse Study Presentation 3 19 13.pptx

Here you go guys.

I did not do much proff reading, so please do that and make any changes you find.

Thanks

Russell Schreiber P.E
Director of Public Works
City of Wichita Falls Texas
940 761 7477

On Wed, Mar 13, 2013 at 9:46 AM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:

Yes, figured you'd want to add something to this. Talk to you all this afternoon.

From: Russell Schreiber [mailto:russell.schreiber@wichitafallstx.gov]
Sent: Wednesday, March 13, 2013 9:36 AM
To: Crawford, Susan
Cc: tdh@cpbwf.com
Subject: Re: Presentation

Dean/ Susan

I have defiled your presentation by adding in some slides. I think it is important for the council to know how CV fits into the overall reuse project.

I have attached the revised presentation and we can discuss at 1. I plan to add a few more slides with an Alt 5 CV/Irrigation.

Russell Schreiber P.E

Director of Public Works

City of Wichita Falls Texas

[940 761 7477](tel:9407617477)

On Tue, Mar 12, 2013 at 4:27 PM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:

Here is the draft presentation for your review and our discussion tomorrow at 1PM. There are still formatting things that need to be done to make it look better.

Regards,

Susan

From: Dean Hinton [mailto:tdh@cpbwf.com]

Sent: Tuesday, March 12, 2013 4:09 PM

To: 'Russell Schreiber'

Cc: Crawford, Susan

Subject: RE: Presentation

Yes. I'll be there at 1.

T. Dean Hinton, P.E.

Corlett, Probst & Boyd, PLLC

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OK P.E. #24372

TBPE Firm F-279

From: Russell Schreiber [<mailto:russell.schreiber@wichitafallstx.gov>]
Sent: Tuesday, March 12, 2013 4:05 PM
To: Crawford, Susan
Cc: Dean Hinton
Subject: Re: Presentation

Sounds good

Dean you coming up here? we can call Susan from here.

Russell Schreiber P.E
Director of Public Works
City of Wichita Falls Texas
[940 761 7477](tel:9407617477)

On Tue, Mar 12, 2013 at 3:45 PM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:
How does after lunch at 1PM sound? That will give you more time to review slides prior to the call.

Susan

From: Russell Schreiber [<mailto:russell.schreiber@wichitafallstx.gov>]
Sent: Tuesday, March 12, 2013 3:43 PM
To: Crawford, Susan
Cc: Dean Hinton
Subject: Re: Presentation

Sure

I have a Region B meeting at 10. We can do it before then or after lunch, pick it.

Russell Schreiber P.E
Director of Public Works
City of Wichita Falls Texas
[940 761 7477](tel:9407617477)

On Tue, Mar 12, 2013 at 3:32 PM, Crawford, Susan <CrawfordSL@cdmsmith.com> wrote:

Russell, I am working on it and about 75% done; should send you something by 5PM at the latest. Can we set up a time to review this together tomorrow morning?

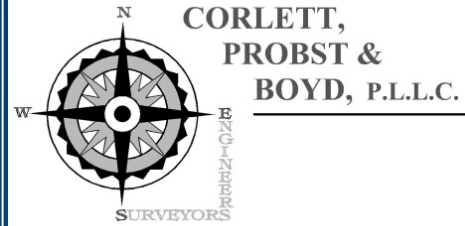
Susan

From: Russell Schreiber [mailto:russell.schreiber@wichitafallstx.gov]
Sent: Tuesday, March 12, 2013 3:30 PM
To: Dean Hinton; Crawford, Susan
Subject: Presentation

How's the presentation coming along guys?

I have seen the agenda and it is pretty full with a few controversial issues which could consume quite a bit of time. I would guess that we will not be ready for exe session until 10 or later.

Russell Schreiber P.E
Director of Public Works
City of Wichita Falls Texas
[940 761 7477](tel:9407617477)



CITY OF WICHITA FALLS WATER REUSE FEASIBILITY STUDY

**CDM
Smith**

City Council Briefing
March 19, 2013



Presented by:
Susan Crawford, PE
Dean Hinton, PE

Presentation Agenda

- Project Background / Assumptions
- Review of Reuse Feasibility Study Alternatives
- Evaluation of Alternatives
- Recommendation for Implementation
- Questions

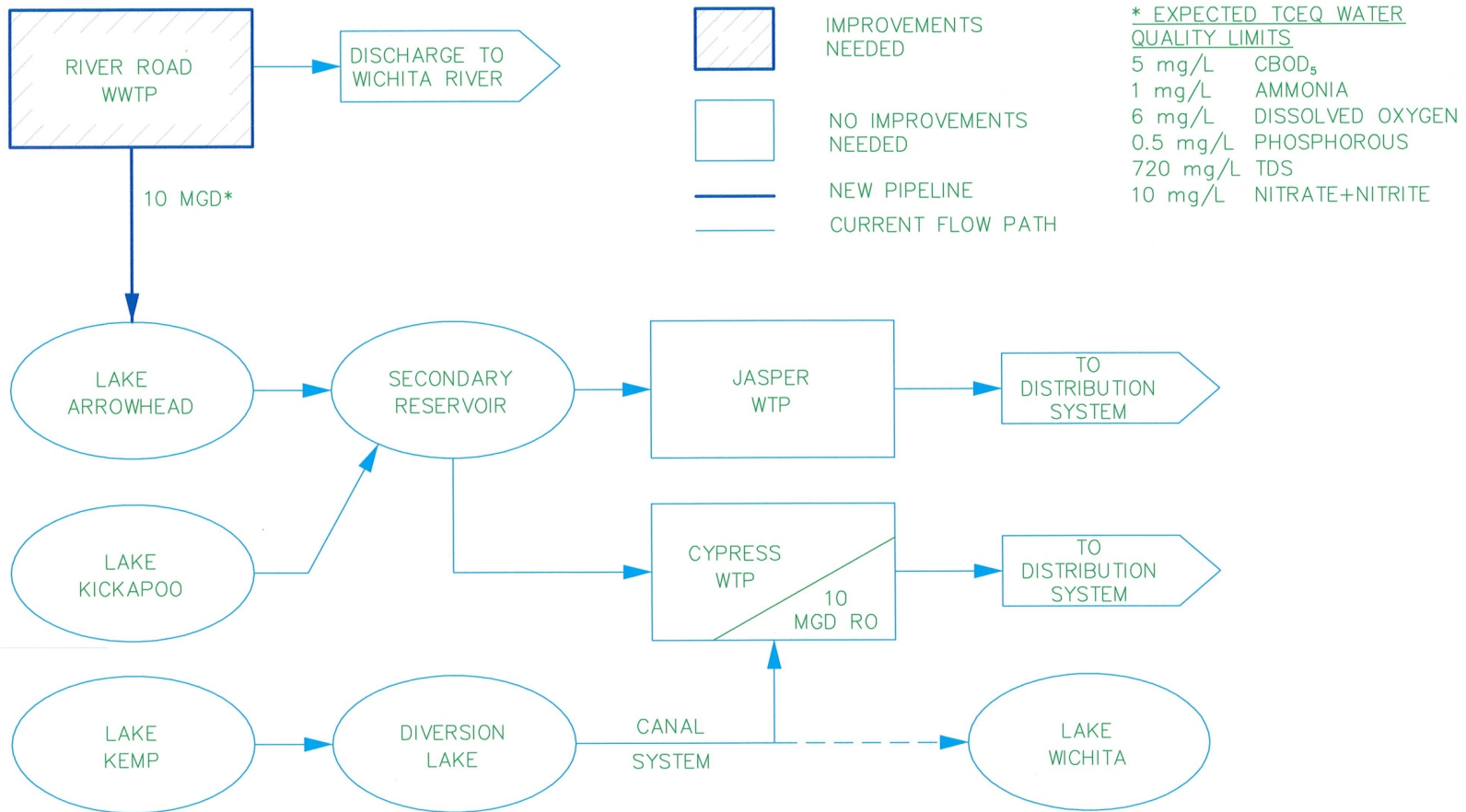
Project Background

- In 2012, the combined Lake Arrowhead and Lake Kickapoo levels dropped below 50% of conservation pool—enacting the Stage 2 Drought Warning Restrictions
- In February 2013, combined lake levels dropped below 40%--enacting the Stage 3 Drought Emergency Declaration
- Due to the ongoing drought emergency, City is evaluating options for supplementing their existing water supplies
- This Reuse Feasibility Study expands on and further evaluates viable alternatives that were identified in the 2000 Water Supply Feasibility Study

Reuse Feasibility Study Assumptions

- All evaluations are based on 10 mgd of reclaim water from the River Road WWTP pumped continuously (365/24)
- Based on correspondence with TCEQ:
 - Indirect Potable Reuse (IPR) = Augmentation of a drinking water source (surface or ground water) with wastewater treatment plant effluent that has been subjected to physical, biological, and/or chemical treatment in addition to blending with a natural or man-made water source that provides at least 30-days detention time
 - Direct Potable Reuse (DPR) = When wastewater treatment plant effluent receives advanced constructed physical, biological and/or chemical treatment prior to being distributed for human consumption

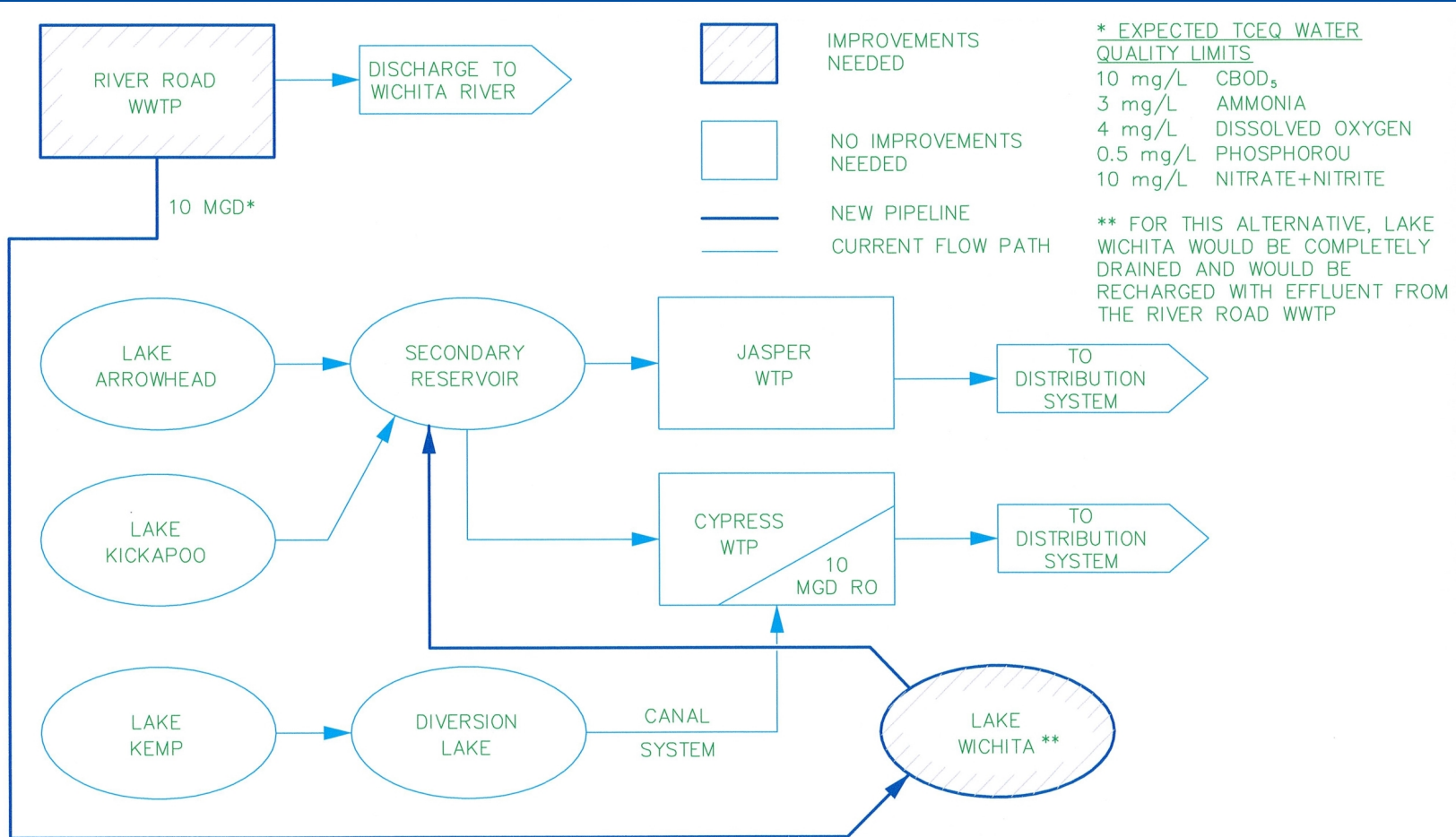
Alt. 1: Indirect Potable Reuse via Lake Arrowhead



Alt. 1: IPR via Lake Arrowhead (cont.)

- As long as same quantity of water pumped into lake is taken out, there is negligible additional loss to evaporation.
- Will require improvements to the River Road WWTP to meet the total phosphorous permit limit.
- A revised Adjudication Certificate for L. Arrowhead should be obtained. Current certificate authorizes City to divert 40.2 mgd (45,000 acre-ft) per year, at a rate not to exceed 60.3 mgd maximum.

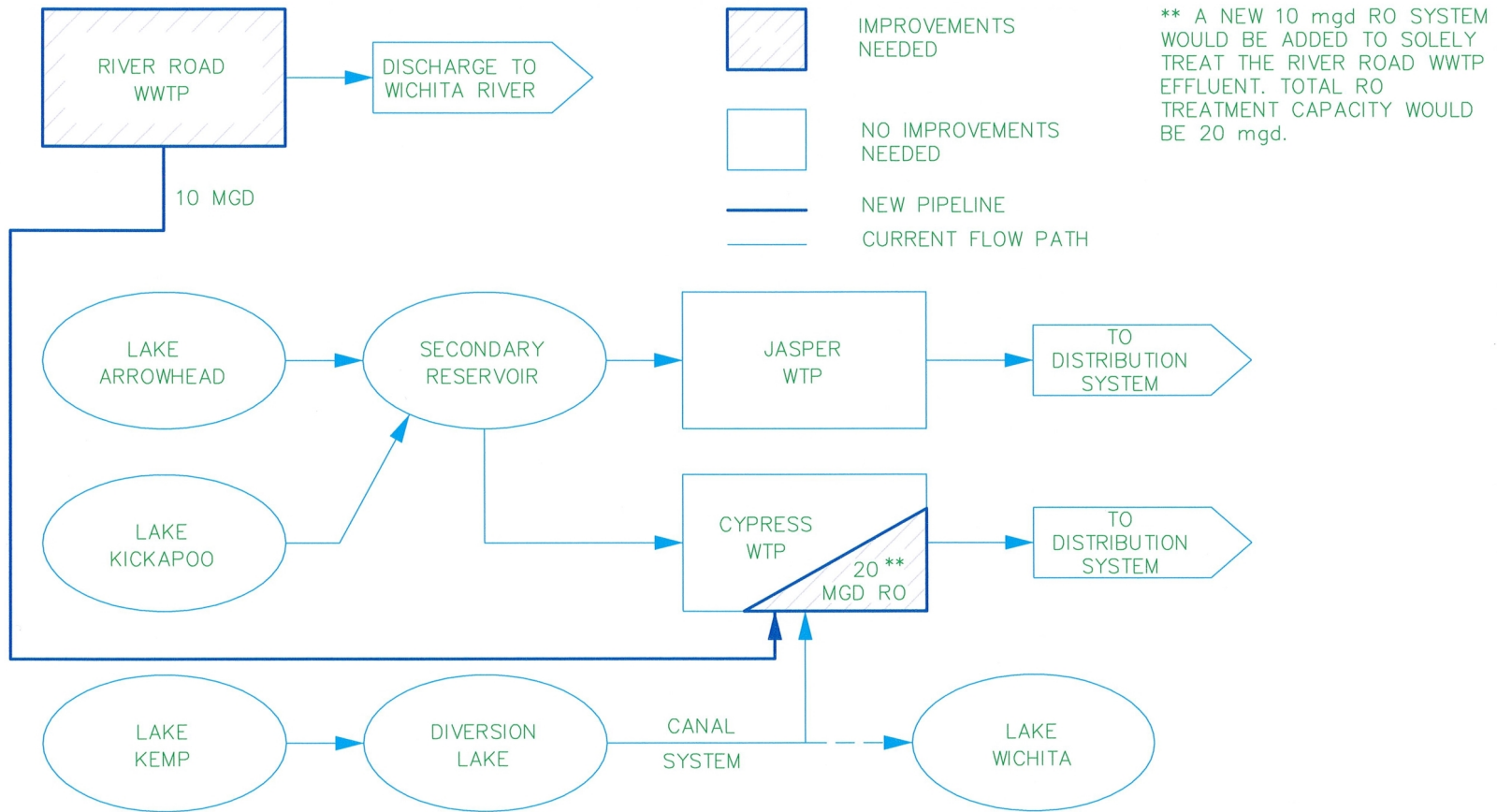
Alt. 2: Indirect Potable Reuse via Lake Wichita



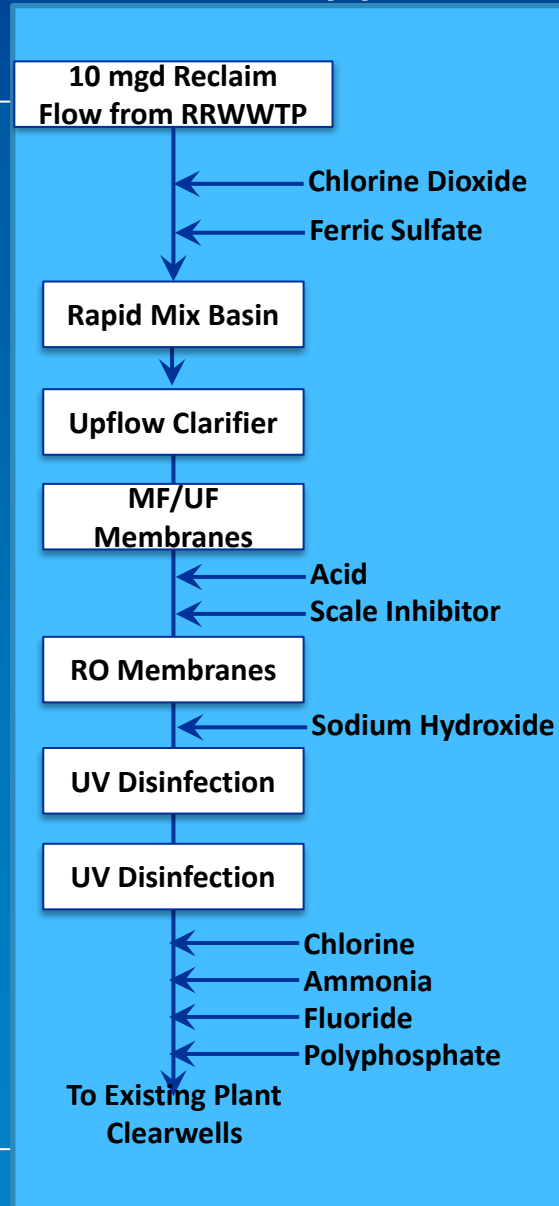
Alt. 2: IPR via Lake Wichita (cont.)

- Very poor water quality in lake results in need to drain lake and refill with 100% reclaim water.
- The small volume of the lake creates several issues:
 - Requires significant nutrient reduction (of total nitrogen and total phosphorous) in the River Road WWTP effluent to preclude eutrophication in the lake.
 - Requires dredging of lake sediment to reduce the internal nutrient load and help preclude eutrophication.
 - Pumping reclaim water continuously to the lake while maintaining a minimum water level target results in frequent overflows of the lake
- A revised Adjudication Certificate for L. Wichita is required to withdraw up to 10 mgd per year.

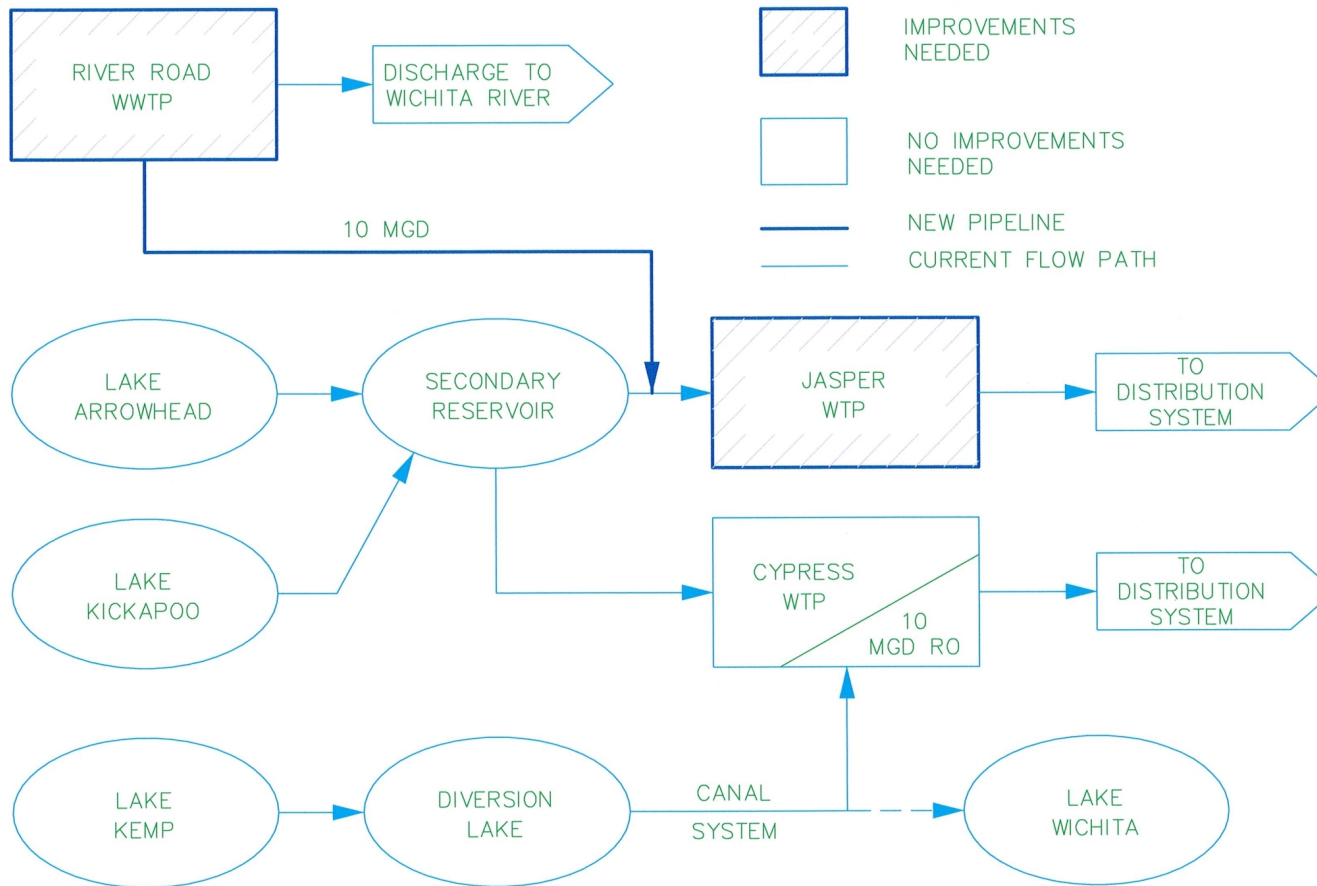
Alt. 3: Direct Potable Reuse via Cypress WTP



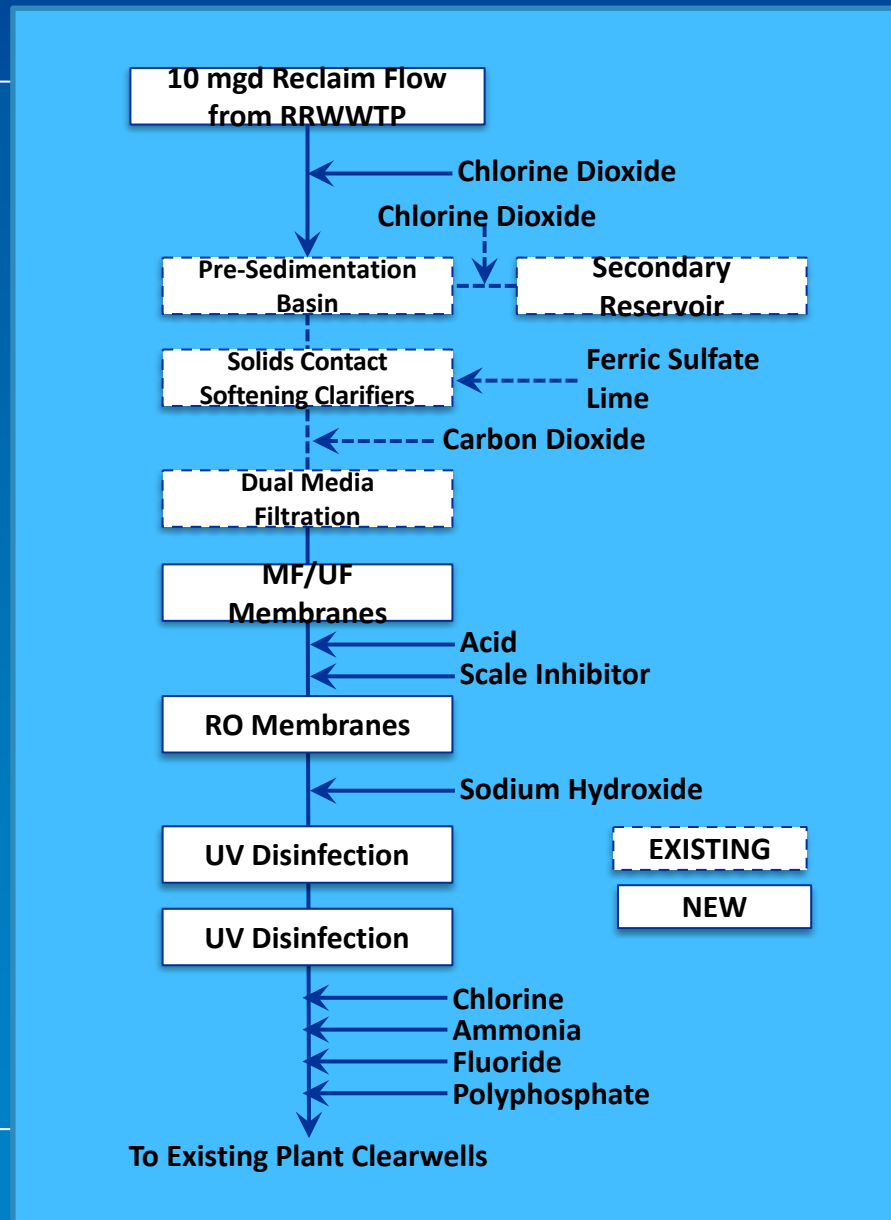
Alt. 3: DPR via the Cypress WTP (cont.)



Alt. 4: Direct Potable Reuse via Jasper WTP



Alt. 4: DPR via the Jasper WTP (cont.)



Capital and O&M Cost Evaluations

	Alt. 1 IPR via Lake Arrowhead	Alt. 2 IPR via Lake Wichita	Alt. 3 DPR via Cypress WTP	Alt. 4 DPR via Jasper WTP
Pumping, Conveyance and Storage				
Capital Cost:	\$18,520,000	\$124,722,000	\$16,554,000	\$5,670,000
O&M Cost:	\$234,500	\$552,500	\$1,301,000	\$53,000
River Road WWTP Improvements				
Capital Cost:	\$9,708,000	\$33,591,000	\$11,610,000	\$11,610,000
O&M Cost:	\$545,000	\$1,298,000	\$348,000	\$348,000
Cypress WTP Improvements				
Capital Cost:	\$0	\$0	\$63,044,000	\$0
O&M Cost:	\$0	\$0	\$1,891,000	\$0
Jasper WTP Improvements				
Capital Cost:	\$0	\$0	\$0	\$63,671,000
O&M Cost:	\$0	\$0	\$0	\$1,910,000
Totals				
Capital Cost:	\$28,228,000	\$158,313,000	\$91,208,000	\$80,951,000
O&M Cost:	\$779,500	\$1,850,500	\$3,540,000	\$2,311,000

Present Worth Costs for Each Alternative

- Alt. 1: IPR to Lake Arrowhead = \$ 39,835,000
- Alt. 2: IPR to Lake Wichita = \$185,843,000
- Alt. 3: DPR via Cypress WTP = \$143,873,000
- Alt. 4: DPR via Jasper WTP = \$115,332,000

Advantages & Disadvantages of Each Alternative

	Advantages	Disadvantages
Alt. 1 IPR Via Lake Arrowhead	+ Lowest capital and present worth cost	– Will require further discussion with TCEQ regarding the TDS permit limit to confirm advanced treatment for TDS will not be required
	+ Easier to permit and less impact to lake water quality	– Will require a revised adjudication certificate
	+ Infrequent lake overflows; allows use of all reuse water	
Alt. 2 IPR Via Lake Wichita	+ Supplementing the lake with reclaim water could help with maintaining lake levels and will improve the lake water quality	– Highest capital and present worth costs
	+ There is a savings to the City in not having to divert Lake Kemp water to maintain minimum lake levels	– The water balance model demonstrated that overflow events will occur quite frequently, resulting in a loss of water source to meet City water demands.
	+ Would allow the City to use a water right they currently have	– Water quality of lake is very poor and will require total drainage of lake and refilling with reclaim water to be a viable alternative. The influence of lake sediment on nutrient loading in the lake will require dredging, which is very expensive.
		– Requires significant improvements to the RRWWTP to reduce total nitrogen and total phosphorous levels to preclude eutrophication of the lake.
		– Will require revised adjudication of water rights, as the City is not currently authorized to withdraw 10 mgd.

Advantages & Disadvantages of Each Alternative

	Advantages	Disadvantages
Alt. 3 DPR Via the Cypress WTP	+ Allows use of all reuse water	– Will be challenging alternative to obtain TCEQ approval (long schedule)
		– Must overcome public perception of DPR
		– Some pilot testing would be recommended to better determine capital and O&M costs
		– High present worth, capital and O&M costs
Alt. 4 DPR Via the Jasper WTP	+ More conservative treatment over Alternative 3	– Like Alt. 3, will be a challenging alternative to obtain TCEQ approval (long schedule)
		– Must overcome public perception of DPR
	+ Allows use of all reuse water	– Some pilot testing would be recommended to better determine capital and O&M cost
		– High present worth, capital and O&M cost

Recommendation for Implementation

- Alternative 1: Indirect Potable Reuse to Lake Arrowhead

	Alt. 1 IPR via Lake Arrowhead	
Pumping, Conveyance and Storage		
Capital Cost:	\$18,520,000	
O&M Cost:	\$234,500	
River Road WWTP Improvements		
Capital Cost:	\$9,708,000	
O&M Cost:	\$545,000	
Cypress WTP Improvements		
Capital Cost:	\$0	
O&M Cost:	\$0	
Jasper WTP Improvements		
Capital Cost:	\$0	
O&M Cost:	\$0	
Totals		
Capital Cost:	\$28,228,000	
O&M Cost:	\$779,500	

How does Coronado Ventures fit into Reuse Plan?

- CV will take 6.0 MGD with 1.2 MGD return flow, Net 4.8 MGD of demand
- Results in 5.2 MGD available for water supply and/or other uses
- CV to build their portion of the Reuse system, City to pay to upsize facilities to meet our objectives.
- Does this affect the recommended alternative?

Financial Analysis for each Alternative

Alt 1 Lake Arrowhead

- With Coronado Ventures
 - 5.2 MGD available
 - \$1.93 mill annual debt service
 - \$1.8 mill annual revenue
 - 1% rate increase
 - City cost \$68 per MG
- Without Coronado Ventures
 - 10 MGD available
 - \$2.4 mill annual debt service
 - 12% rate increase
 - City cost \$658 per MG

Financial Analysis for each Alternative

Alt 2 Lake Wichita

- With Coronado Ventures
 - 5.2 MGD available
 - \$12.99 mill annual debt service
 - \$1.8 mill annual revenue
 - 56% rate increase
 - City cost \$5,896 per MG
- Without Coronado Ventures
 - 10 MGD available
 - \$12.46 mill annual debt service
 - 67% rate increase
 - **City cost \$3,688 per MG**

Financial Analysis for each Alternative

Alt 3 Cypress WTP Improvements

- With Coronado Ventures
 - 5.2 MGD available
 - \$7.3 mill annual debt service
 - \$1.8 mill annual revenue
 - 27% rate increase
 - City cost \$2,898 per MG
- Without Coronado Ventures
 - 10 MGD available
 - \$7.75 mill annual debt service
 - 39% rate increase
 - **City cost \$2,123 per MG**

Financial Analysis for each Alternative

Alt 4 Jasper WTP Improvements

- With Coronado Ventures
 - 5.2 MGD available
 - \$6.58 mill annual debt service
 - \$1.8 mill annual revenue
 - 22% rate increase
 - City cost \$2,520 per MG
- Without Coronado Ventures
 - 10 MGD available
 - \$6.88 mill annual debt service
 - 33% rate increase
 - **City cost \$1,885 per MG**

Alt 5: Coronado/ Irrigation

Supply Coronado Ventures with 4.8 MGD
Supply WFCC and Weeks Park GC 2.0 MGD
3.2 MGD remaining unused
Capital Costs ~\$12,500,000

Alt 5: Coronado/ Irrigation

- Advantages:
 - No improvements to WWTP or WTP required
 - All TCEQ approvals and authorizations are in place.
 - Eliminates Public opposition, no “yuck” factor
 - Some reuse water would be available for future development
- Disadvantages:
 - Option not viable without CV, not enough irrigation demand
 - Water could not be used for raw water supply during drought
 - All water available is not utilized

Alt 5: Financial Analysis

- With Coronado Ventures
 - 5.2 MGD available
 - \$0.595 mill annual debt service
 - \$1.8 mill annual revenue
 - No rate increase
 - City Earns \$632 per MG (City nets \$1.2 mill annually)
- Without Coronado Ventures
 - 10 MGD available
 - \$1.06 mill annual debt service
 - 5% rate increase
 - City cost \$290 per MG

Conclusions

- Both Alt 1: Lake Arrowhead & Alt 5: Coronado/ Irrigation appear to be financially viable
- However Alt 5 is not viable without Coronado Ventures developing
- Alt 5 also does nothing to shore up the raw supply

Therefore Alt 1: Lake Arrowhead appears to be the best overall option.

Reuse will help extend water supplies and will NOT make the City completely drought resistant. There WILL be other droughts and there WILL be future water restrictions.

QUESTIONS?