



MEMORANDUM

To: mreed@ReynoldsInc.com, mcmanus@water.ca.gov,
chris.petersen@mwhglobal.com, neil.schild@mwhglobal.com
From: Laura Jean Wilcox
Date: March 17, 2006
Subject: M&T Chico Ranch/Llano Seco Ranch
Conference Call #1 - Meeting Minutes – March 17, 2006

Attendees

Matt Reed	ReynoldsInc	614-339-0099	mreed@ReynoldsInc.com
Chris Petersen	MWH	916-418-8264	chris.petersen@mwhglobal.com
Laura Jean Wilcox	MWH	916-418-8411	laura.j.wilcox@mwhglobal.com

Summary

This conference call was the first of three to discuss alternatives for potentially reducing costs of the Ranney well system at M&T Chico Ranch/Llano Seco Ranch. Present in the call were Matt Reed, Chris Petersen, and Laura Jean Wilcox. We began with an update on the status of the project and an overview of our current scope of work. In a nutshell, this scope is aimed towards refining the estimates that we came up with last year. Matt Reed agreed to do an analysis of river meander and yield along with determining the effective distance to the recharge boundary based on collected data during the aquifer test compared to the actual distance to the river.

Action items from the meeting were the following:

- Laura Jean will post the aquifer test report and data on an ftp site for Matt Reed.
- Laura Jean and Neil try to track down pump information and pump curves for the existing intake station to see if we can reuse them for collector wells.
- Laura Jean and Chris will distribute a draft of the memo reporting on collector well survey results before next Wednesday (3/22).
- Chris will look through Feb 16-18, 2005 meeting minutes for a question posed by Eric Larsen.
- Matt Reed will develop an analysis of river meander vs. well yield and will also analyze aquifer test data to formulate distance to recharge boundary vs. distance to river.
- Arrange amendment to existing contract with Matt Reed.
- Arrange next meeting --> **Wednesday, March 22 at 9 AM?**



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To: mreed@ReynoldsInc.com, mcmanus@water.ca.gov,
chris.petersen@mwhglobal.com, neil.schild@mwhglobal.com
From: Laura Jean Wilcox
Date: March 23, 2006
Subject: M&T Chico Ranch/Llano Seco Ranch
Conference Call #2 - Meeting Minutes – March 23, 2006

Attendees

Matt Reed	ReynoldsInc	614-339-0099	mreed@ReynoldsInc.com
Dan McManus	DWR	530-529-7373	mcmanus@water.ca.gov
Chris Petersen	MWH	916-418-8264	chris.petersen@mwhglobal.com
Laura Jean Wilcox	MWH	916-418-8411	laura.j.wilcox@mwhglobal.com

Summary

1. Decrease conveyance costs

- a. Line the canal. Dan states that he estimates most losses occur along the section of canal between Big and Little Chico Creek. He says losses could be around 25% (conservative), but that we'd need to measure for sure to get a better idea.
- b. Place some Ranney Wells down by Llano Seco. We would need to confirm that the gravels encountered at the test well near the pump station are also present down at Llano Seco. Dan may be able to find some existing logs there, but ideally, we would drill our own test boreholes to determine geology. He stated that the Baldwin gravel mining operation test holes showed gravels. It is not favorable to locate Ranney Collectors near the river further south because they would have to cross 2 sloughs and additional pipeline and/or canal would need to be built.

2. Discussion of Sonoma County Wells

- a. The geology is very different at Sonoma. It is a narrow, confined, U-shaped valley with highly transmissive sediments. Their yield is directly related to the amount of water in the river, thus they inflate the dams to raise river level and increase yield.
- b. The river itself is much smaller than the Sacramento. More realistic comparisons would be wells along the Missouri.
- c. Send Sonoma County report by Les to Matt Reed.

3. Questions for Neil

- a. Is there a draft agenda for the meeting in April?
- b. Does he have a copy of the detailed meeting minutes from the Workshop last February?

c. How can we be sure that we're comparing apples and apples when comparing designed yield of the collector wells to other proposed alternatives?

4. Next meeting

Friday March 24, 10 am. We'll call you at the following numbers unless you inform me otherwise:

-Dan 530-529-7373

-Matt 614-339-0099

5. Draft report

A draft of the survey results letter report was attached to the meeting minutes distribution list as a pdf.



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To: mreed@ReynoldsInc.com, mcmanus@water.ca.gov,
chris.petersen@mwhglobal.com, neil.schild@mwhglobal.com

From: Laura Jean Wilcox

Date: March 24, 2006

Subject: M&T Chico Ranch/Llano Seco Ranch
Conference Call #3 - Meeting Minutes – March 24, 2006

Attendees

Matt Reed	ReynoldsInc	614-339-0099	mreed@ReynoldsInc.com
Dan McManus	DWR	530-529-7373	mcmanus@water.ca.gov
Chris Petersen	MWH	916-418-8264	chris.petersen@mwhglobal.com
Laura Jean Wilcox	MWH	916-418-8411	laura.j.wilcox@mwhglobal.com
Neil Schild	MWH	916-418-8271	neil.schild@mwhglobal.com

Summary

1. Next DU Workshop

Neil informed the group that the next planned workshop is currently scheduled for April 24/25, 2006.

2. Feasibility of Locating Some Ranney Wells Further South?

Dan McManus did get a chance to look at well logs in that area. The logs show that the gravels are quite thick in the Llano Seco area, on the order of 24 to 118 feet below ground surface. At the southern end of the property, this lessens to a gravel/sand zone of approximately 40 to 75 feet. There may not result in significant savings because it is estimated that the same amount of lift would be required as wells at M&T. If wells were placed near Llano Seco, then may not get river credits for the production volume. **Neil is going to discuss this alternative with Les to see if it is feasible or appealing.** The point was made that if the river migrates westward, the collectors could draw mostly groundwater even when located next to the levy near the current facility.

3. Estimation of Energy Costs

Assume lift of 75 feet by Llano Seco.

Assume 1 collector well to north of existing pumping facility and 2 to the south.

Assume that pump would lead directly into a pipeline to feed canal OR would be used to fill wet well and then be pumped again to canal. If the wet well is used, we will add additional lift cost, but save capital cost of getting water from current pumping facility to the canal. Both methods will be evaluated.

4. Draft deliverables for Tuesday 3/28.

Matt Reed will give estimations on the following:

- The number of wells required.
- The estimated yield.
- Capital costs, considering the highly inflated rates in the last year and typical California costs.
- O & M cost estimates.
- Chart of yield vs. distance to hydraulic boundary.
- A comparison of energy cost, well yield, and drawdown.

5. Feedback on the Tech Memo

It is difficult to compare the "cost of water" responses as many include treatment and/or high delivery costs as a potable water source. This is why this information was not presented in the letter report.

Some facilities observed degradation in yield with time. Matt Reed says that he expects the system to perform similar to Nearman Water Treatment Plant, Kansas City, Kansas. The Missouri River flows at a similar rate and character and the geology is also similar.

6. Next meeting

The next conference call will be held with Chris, Laura Jean, and Matt on **Tuesday, 3/28** or **Wednesday 3/29** to discuss results from item 5.