CEMVM-PM-P 17 May 2001

MEMORANDUM FOR RECORD

SUBJECT: Meeting in Arkansas Soil and Water Conservation Commission Office to Discuss Irrigation Efficiencies and Aquifer Protection for the Grand Prairie Area held on May 15, 2001.

1 This memo is a record of a meeting held in the offices of the Arkansas Soil and Water Conservation Commission on May 15, 2001, to discuss irrigation efficiencies and aquifer protection aspects of the Grand Prairie Area Demonstration project. The meeting was held to address the misconceptions in Mr. Alan Mueller's statement to the Mississippi River Commission. The meeting was offered by the Corps to address these misconceptions. A list of attendees is attached. The attendees included irrigation experts cited by Mr. Mueller in conversations following his MRC presentation.

2. A meeting agenda is attached. The primary topics of conservation are discussed below:

Irrigation efficiencies. Mr. Mueller said that he was not an expert in irrigation efficiencies but had heard much about improved efficiencies for experts. Mr. Mueller believed that achieving 80% efficiency is possible. Mr. Mueller invited Mr. Phil Tacker from the University of Arkansas Agricultural Extension Service to outline ways to reach higher efficiencies through the use of multi-inlet pipes, surge irrigation, center pivot, no till, and sub surface drip irrigation. After some discussion Mr. Phil Tacker agreed that too many variations exist to improve the efficiency throughout the Grand Prairie Area. He said that obtaining a higher efficiency was possible on an individual farm but could not be achieved on a large area. When asked what a reasonable efficiency for design purposes, he agreed that 70% was appropriate for planning of the Grand Prairie Area Demonstration Project. The project would construct the infrastructure on the farms for higher irrigation efficiencies including storage, tail water recovery systems, pipelines and other infrastructure and offer a complete water management plan. To achieve higher efficiencies, intensive management would be necessary. Even if higher efficiencies were attainable, a delivery system would still be necessary to maintain irrigated agriculture in the Grand Prairie and protect the aquifers. All agreed that we would strive for higher efficiencies, that the project would establish the infrastructure necessary to achieve higher efficiencies, but the over the project area efficiencies could not be reliably attained. 70% was appropriate for project planning and increasing efficiency would not eliminate the need for a delivery system.

Aquifer protection. The aquifer protection aspects of the project were discussed.

The Sparta Aquifer is a deeper confined aquifer with pure water that serves as the drinking water source for the project area. As the alluvial aquifer is depleted, farmers are turning to the Sparta though it is expensive to develop wells and pump water from those depths. The project uses no water from the Sparta to meet the needs of the area.

The alluvial aquifer is the source for over 80% of the irrigation water being used in the Grand Prairie. By 2015, it will no longer be a viable source for irrigation. The project would continue

to use water from the alluvial at the "safe yield" of the aquifer. The safe yield was computed by examining each cell in the aquifer model, determining the safe yield of that individual cell under future conditions (no water was withdrawn from cells with a saturated thickness of less than 20 feet because a well could not be developed with only 20 feet of saturated thickness remaining), and accessing the water only under the irrigated cropland. This estimate was considered to be a conservative value and would allow for recharge over a long period of time. This would provide for approximately 8% of the need in the project area. The safe yield value used was 35,600 acre-feet. Currently, the demand for ground water is over 400,000 acre-feet per year. The current recharge is estimated to be between 100,000 and 130,000 acre-feet per year. The project has an unmet demand of 59,800 acre-feet per year meaning some of the area would not be in production or some of the crops would not be fully irrigated on an average annual basis. Even if all of the unmet demand were met through the alluvial aquifer, recharge would exceed withdrawals.

The project will protect both the alluvial and Sparta aquifers in the area. Without the project, both the alluvial aquifer and Sparta aquifer, the source for drinking water, will be depleted with losses of $46 million annually to the national economy and disastrous consequences to the local, agricultural based economy.

Mr. Danny Goodwin, a recognized aquifer expert with the USDA's National Water Management Center, stated that without an import system the aquifers would not gain any protection even if the water use efficiency approached 100%. However, the Grand Prairie Area Demonstration project with its efficiency and storage and a delivery system would provide for protection of the Sparta and alluvial aquifer. Mr. Goodwin offered to work with the USFWS staff to help further their understanding of the aquifers.

3. At the conclusion of the meeting, Mr. Bodron summarized the discussions and conclusions that 70% efficiency was appropriate for the Grand Prairie Area Demonstration Project, 80% was not attainable and, even if it was attainable, would not eliminate the need for a delivery system, and the project would protect the Sparta and alluvial aquifers. No one at the meeting disagreed with the conclusions.

/S/
James A. Bodron, P.E.
Project Manager

Meeting held on May 15, 2001, at the Arkansas Soil and Water Conservation Commission Conference Room

Meeting Participants

1.	Gene Sullivan	White River Regional Irrigation District	(501) 676-7420
2.	Edward Lambert	Memphis District Corps of Engineers	(901) 544-0707
3.	Deborah Ryckeley	U.S. Fish and Wildlife Service	(501) 513-4477
4.	Joseph Krystofik	U.S. Fish and Wildlife Service	(870) 347-1506
5.	Danny Goodwin	Natural Resources Conservation Service	(501) 210-8906
6.	Allan Muller	U.S. Fish and Wildlife Service	(501) 513-4475
7.	Craig Uyeda	Arkansas Game and fish Commission	(501) 219-4310
8.	Tony Stevenson	Natural Resources Conservation Service	(501) 301-3141
9.	Jim Bodron	Memphis District Corps of Engineers	(901) 544-3639
10.	Tim Flinn	Memphis District Corps of Engineers	(901) 544-3480
11.	John Terry	U.S. Geological Survey	(501) 228-3613
12.	Bob Morgan	Arkansas Soil and Water Conservation Com	(501) 682-3954
13.	Earl Smith	Arkansas Soil and Water Conservation Com	(501) 682-3979
14.	Tony Ramick	Arkansas Soil and Water Conservation Com	(501) 682-3914
15.	Phil Tacker	University of Arkansas - CES	(501) 671-2267
16.	Earl Vories	University of Arkansas - CES	(870) 526-2199
17.	Ken Brazil	Arkansas Soil and Water Conservation Com	(870) 682-3980
18.	Laurie Dabbs	White River Regional Irrigation District	(870) 673-4090

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Grand Prairie Area Demonstration Project

Will project protect the aquifer?

Yes. The project will protect both the Sparta Aquifer and the Mississippi Valley Alluvial Aquifer in the project area.

The Sparta Aquifer is a deeper confined aquifer with pure water that serves as the drinking water source for the project area. As the alluvial aquifer is depleted, farmers are turning to the Sparta though it is expensive to develop wells and pump water from those depths. The project uses no water from the Sparta to meet the needs of the area.

The alluvial aquifer is the source for over 80% of the irrigation water being used in the Grand Prairie. By 2015, it will no longer be a viable source for irrigation. The project would continue to use water from the alluvial at the "safe yield" of the aquifer. The safe yield was computed by examining each cell in the aquifer model, determining the safe yield of that individual cell under future conditions (no water was withdrawn from cells with a saturated thickness of less than 20 feet because a well could not be developed with only 20 feet of saturated thickness remaining), and accessing the water only under the irrigated cropland. This estimate was considered to be a conservative value and would allow for recharge over a long period of time. This would provide for approximately 8% of the need in the project area. The safe yield value used was 35,600 acre-feet. Currently, the demand for ground water is over 400,000 acre-feet per year. The current recharge is estimated to be between 100,000 and 130,000 acre-feet per year. The project has an unmet demand of 59,800 acre-feet per year meaning some of the area would not be in production or some of the crops would not be fully irrigated on an average annual basis. Even if the all of the unmet demand was met through the alluvial aquifer, recharge would exceed withdrawals.

The project will protect both the alluvial and Sparta aquifers in the area. Without the project, both the alluvial aquifer and Sparta aquifer, the source for drinking water, will be depleted with losses of $46 million annually to the national economy and disastrous consequences to the local, agricultural based economy.

Calculation of safe yield – GRR page 30, DEMAND & SUPPLY DATA, The "safe yield" used in the water balance for the project was calculated by using the aquifer model and examining each cell. If the aquifer water level in the cell was less than 20 feet of saturated thickness, it was assumed that a well could not be developed in that cell for the life of the project. In the cells that could supply water, only the water under the irrigated cropland was considered to be available

for pumping. This was considered to be a conservative estimate that would allow the aquifer to recharge over time.

Recharge – GRR page 68, GROUNDWATER. The current estimated recharge is 100,000 to 130,000 acre feet per year. This recharge is not constant over time since it is directly related to the declines within the alluvial aquifer itself. This decline will continue until the saturated thickness of the aquifer reaches the point that it can no longer support well development.

Use of the Sparta Aquifer – GRR page 67, GROUNDWATER. The Sparta aquifer cannot be viewed as a solution to the declining ground water levels within the alluvial aquifer.

Unmet demand - the amount of acre-feet of water demand in the project area that cannot be met on an average annual basis from all water sources included in the project. This number was calculated to be 59,791 acre-feet. This would mean that a portion of the project area would not be irrigated at all during an average year or that some of the crops would not be fully irrigated every year. If the landowners met all of the unmet demand from the alluvial aquifer, the recharge in the aquifer is greater than the safe yield plus the unmet demand.