

PROJECT NAME: **6004\_003\_BIG SIOUX RIVER**

TERM OF AGREEMENT: **JANUARY 2007 THRU DECEMBER 2009**

Grant Agreement Budget Line Item	WATERSHED IMPROVEMENT FUNDS		
	Total Funds Approved (\$)	Total Funds Expended (\$)	Available Funds (\$)
Personnel- Salary/Benefits	3000	0	3000
Information/Education- Alternative Treatment Systems	154,800	58,815.13	95,984.87
Contractual-Monitoring- Engineering Modeling	60,000	28,007.34	31,992.66
	50,000	0	50,000
<b>Total</b>	<b>157,910</b>	<b>86,822.47</b>	<b>180,977.53</b>

The original agreement called for six sites to be built.  
Three sites have been completed and are now operational.

FUNDING SOURCE	TOTAL PROJECT FUNDING					
	CASH		IN-KIND CONTRIBUTIONS		TOTAL	
	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)
WIRB	267,800.00	86,822.47	-	-	267,800.00	187,138.75
319	204,500.00	15,729.64	-	-	204,500.00	15,729.64
SWCD	1,000.00	1,000.00	-	-	1,000.00	1,000.00
EQIP	61,000.00	61,000.00	-	-	61,000.00	61,000.00
CATTLE ASSOC.	3,000.00	1,000.00	2,000.00	2,000.00	5,000.00	3,000.00
FARM BUREAU	100.00	-	-	-	100.00	-
<b>TOTAL</b>	<b>537,400.00</b>	<b>265,868.39</b>	<b>2,000.00</b>	<b>2,000.00</b>	<b>534,300.00</b>	<b>264,868.39</b>

Watershed Improvement Funds Contribution: Approved application budget= 49.83%  
Actual= 70.39%

The Lyon Farm Bureau has been contacted about their funding pledge but has not responded as of 3-31-10.

The Lyon Cattlemen’s Association has been contacted about the balance of their financial pledge but has not responded as of 3-31-10.

<b>PRACTICES &amp; ACTIVITIES</b>				
<b>PRACTICES OR ACTIVITIES</b>	<b>UNIT</b>	<b>APPROVED APPLICATION</b>		<b>PERCENT COMPLETION</b>
		<b>GOAL</b>	<b>ACCOMPLISHMENT</b>	
Public educational meetings/tours	No.	N/A	3	100%
Technical Committee Meetings	No.	N/A	4	100%
Grass Filterstrips	No.	N/A	3	100%
Solid Settling Basins	No.	6	4	66%
Vegetative Infiltration Basins (VIB)	No.	6	2	33%
Vegetative Treatment Areas (VTA)	No.	6	5	83%
Monitoring	No.	N/A	4 (as of 10-09)	100%

Three sites were built on this project and are operational. The systems at all three sites were designed for the 25-year rainfall. All VIB’s and VTA’s were designed so that the vegetation can be harvested to promote regrowth.

Below are description of practices that were completed at each site:

HB Farms, Inc.-

One concrete solid settling basin with two gates for releasing of effluent was built. The effluent from both gates flows into one Vegetative Treatment Area (VTA), which is approximately 270’ long. Then the effluent flows through an approximately 640’ long grass filterstrip before entering an unnamed creek. This point is approximately two miles from a Water of Concern (WOC).

Metal corrugated culverts have been placed at the outlet spillway and earthen berms have been built on the sides of the VTA for diversion of outside waters.

The ultimate number of animal units will be 450 head of beef cattle per owner/operator.

Meyer Stock Farms, Inc.-

This site consists of two feedlots and treatment facilities.

The east lot has one concrete solid settling basin with two outlet gates. The effluent from each both gates flows into one VTA which is approximately 370’ long and 80’ wide. The liquid then enters a grass area of approximately 1000’ in length before entering the Mud Creek (WOC). The VTA has earthen berms on the sides for diversion of outside waters.

The west lot has one concrete solid settling basin with one outlet gate. The effluent flows into a “serpentine” type VTA, which is approximately 380’ long, and then into a grass waterway of approximately 2000’ before entering the Mud Creek (WOC).

The ultimate number of animal units will be 750 head of beef cattle per owner/operator.

### Pig Hill Co.-

This site consists of one concrete solid settling basin with two outlet gates. There is then two separate treatment areas. The systems were built this way so that the operator can shut down one site at a time to allow for drying and harvesting of the vegetation in the VIB's and VTA's.

The west VIB is approximately 285' long and 70' wide. There are three 6" drainage tiles evenly spaced in the VIB for drainage to the VTA. The VTA is approximately 290' long and 70' wide. The effluent then flows approximately 10,345' in a grass area (road ditch) before entering the Mud Creek (WOC).

The east VIB is approximately 325' long and 70' wide. There are also three 6" drainage tiles evenly spaced in the VIB for drainage into the VTA. The VTA is approximately 290' long and 70' wide. The effluent then follows the same path as the west system to the Mud Creek (WOC).

Earthen berms were placed for diversion purposed of outside water from entering the treatment systems. The berms in the center of the treatment areas prevent effluent from flowing from one system to the other.

The ultimate number of animal units will be 995 head of beef cattle per owner/operator.

## **MONITORING AND TEST RESULTS**

Effluent samples were taken at the Pig Hill Co. site during 2009. Sampling and monitoring will continue at this site and at the other two sites that are now operational.

Data from the sample taken at Pig Hill Co. in 2009 was analyzed by Dr. Mary Skopec of the Iowa DNR, water assessment group. A copy of her report is enclosed. Her report states that E. coli bacteria was reduced by approximately 40% and that the following were also reduced- Total Kjeldahl Nitrogen (87%), Total Phosphate (36%), and Total Suspended Solids (92%). The Nitrate + Nitrite increased from the catch basin outlet gates to the outlets at the end the Vegetative Infiltration Basin (VIB) but the increase in concentration is relatively small. The tile in the VIB would be expected to increase the concentration.

A chart has been provided to show a comparison of AGNPS and MinnFarms (FLEVAL) at the three sites which were constructed for this demo. The data shows a decrease in total run-off at the discharge points for HB Farms, Inc. (site 1) and for Meyer Stock Farms, Inc. (site 2). Both of these sites decreased the size of their feedlots and both are dirt lots with concrete pads in the feed bunk areas and all concrete catch basins. Pig Hill Co. (site 3) increased their lot size and the lots and catch basin areas are all concrete.

There is a decrease in pounds of phosphorous discharge at sites 1 and 2. There is also a decrease in pounds of COD discharge at sites 1 and 2. Possible explanation for these decreases is that both lots are dirt lots. More extensive monitoring possibly would have given more data for this occurrence.

## **GENERAL NOTES**

In 2003 and 2004 data was gathered from cattle producers (animal unit #'s, size of feedlots, outside drainage areas, etc.) This information was inputted in the AGNPS (Agricultural Non-Point Source pollution model) computer program to establish a database. A ranking system from this date output was then used to determine which feedlot sites needed possible attention.

A Technical Advisory Committee (TAC) was formed from a group of people with a variety of backgrounds. The TAC used the data output from the AGNPS program to determine which feedlot operators would be contacted for voluntary participation in this study. The input and cooperation from people from the Iowa DNR, ISU Extension, local

cattle feeders, Lyon SWCD Commissioners, Iowa IDALS/DSC, etc. was greatly appreciated.

Field tours were held in 2008 and 2009 to visit the sites that participated in this study. Beth Doran of ISU Extension helped with organizing the tours and getting notices out to the public.

Eighteen people attended the 2008 tour which visited the sites on a preconstruction format. The group was made up of cattle producers/farmers, site design engineers, the Lyon SWCD Commissioners, ISU Extension employees, and area NRCS employees. There was a question and answer sessions at each of the four site at which the site owner explained his reason for participating in the study and his ultimate goals for the feedlot.

For the 2009 tour, there were 45 people that attended. The engineer that designed the final three sites attended the tour and explained her design for each of the different sites. Cattle producers/farmers, area banks and loan officers, DNR and NRCS employees from the state and area offices, SWCD Commissioners, ISU Extension personnel, and IDALS employees attended the tour. Tony Toigo of IDALS gave of presentation on Low Interest Loan Program, answered questions, and handed out informational pamphlets concerning the loan application procedure.

A tour was held on May 25, 2010. Iowa State Representative Dwayne Alons, Iowa State Senators David Johnson and Randy Feenstra, and Iowa Environmental Protection Commissioner Gene Ver Steeg were invited to attended this tour. Only Rep. Alons was able to attend as well as local NRCS/SWCD employees, and SWCD Commissioner Arie Blik.