

MEMORANDUM

TO: Ad-Hoc Subcommittee

FROM: P-MRNRD Staff

SUBJECT: Pigeon/Jones Creek Watershed Flood Control/Recreation
Structure Site #15

DATE: January 6, 2004

Staff has reviewed the RFPs submitted by the following firms:

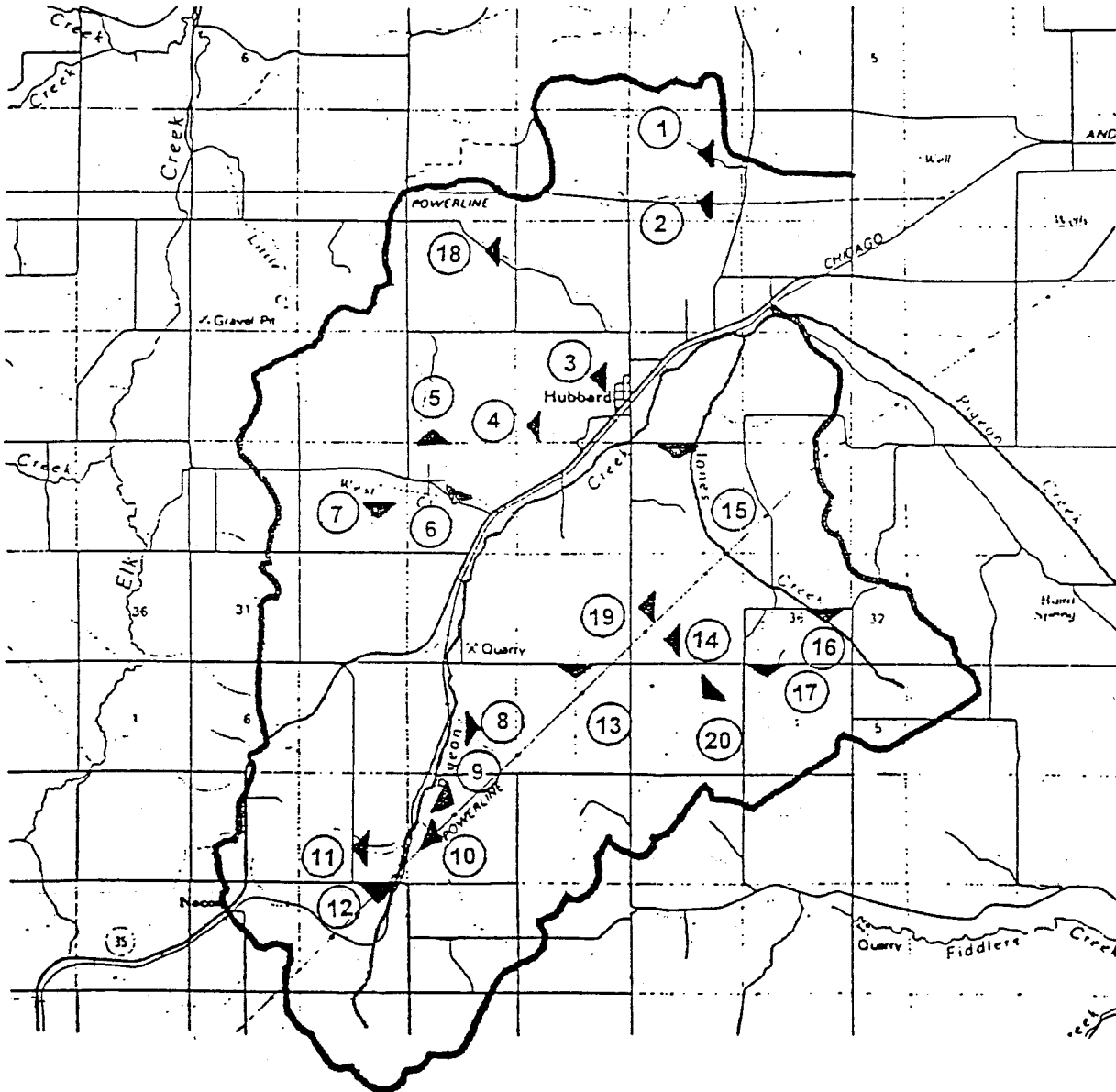
- a. HDR**
- b. Jacobson Helgoth Consultants**
- c. Kirkham Michael Consulting Engineers**
- d. Olsson Associates**

and Staff recommends to the Ad-Hoc Subcommittee that HDR and Olsson Associates be interviewed regarding the project.

Pigeon/Jones Creek Watershed

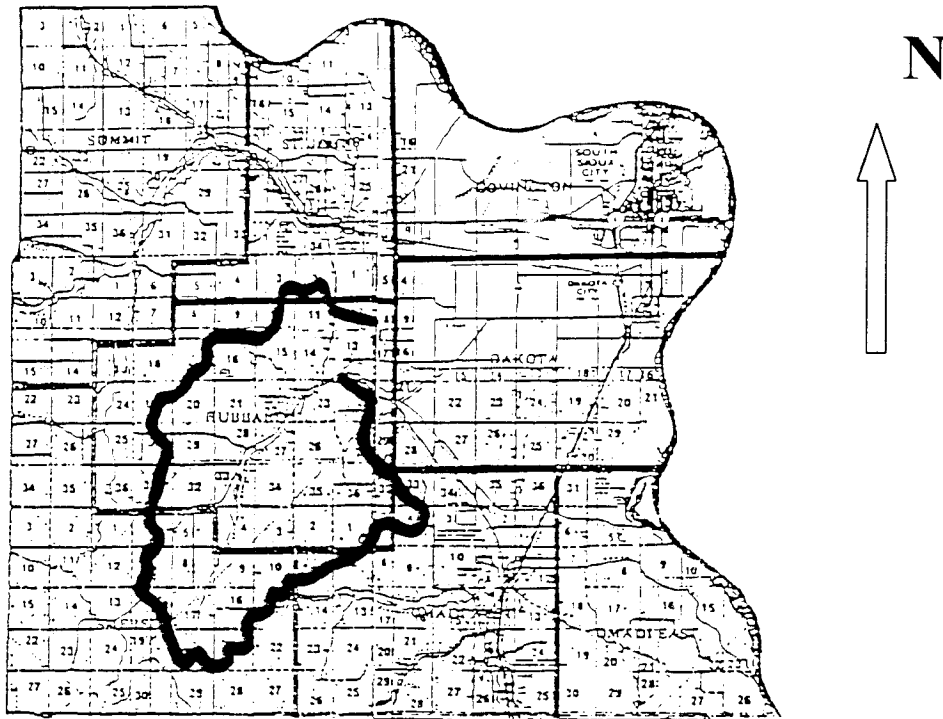
Special Erosion and Sediment Control Project

Structure Sites



- Road Structures: 6, 11, 12, 13, 16, 18
- Grade Stabilization/Flood Control Dams: 1-5, 7-10, 14, 17, 19, 20
- Multi-purpose Recreation Site: 15

Pigeon/Jones Creek Watershed Special Erosion and Sediment Control Project



Dakota County, Nebraska

Pigeon and Jones Creek Watershed covers nearly 34 square miles and has a drainage area of 20,316 acres. It begins north of Hubbard, Nebraska, extends south and west towards Emerson. The eastern portion of the watershed extends to the bluffs and drains into the bottomlands east of Hubbard. U.S. Highway 35 runs through the center of the watershed area.

The majority of this watershed is in crop production, and, because of its strongly sloping terrain, soil erosion and sedimentation are the primary problems. Predominant soils are Crofton and Nora soils with an average slope ranging from 8% to 30%. While soil erosion, grade stabilization and sedimentation are the primary problems associated within the uplands of the watershed; sedimentation and flooding greatly impact the Pigeon Creek drainage ditch and adjoining cropland. The Pigeon Creek drainage ditch flows across the bottomlands of eastern Dakota County, intersects with U.S. Highway 77, and empties into the Missouri River.

Operation, maintenance and improvements have been started on the levees of the Pigeon Creek drainage ditch since the merger of Drainage District No. 5 and the Papio-Missouri River Natural Resources District (NRD) in 1999. This work involves leveling the levee tops, the removal of trees along the creek channel and on the levee, and drainage culvert replacement. Development of a Special Watershed Project is a part of the merger agreement between the Drainage District

and the P-MRNRD. By installing land treatment measures in the uplands of the watershed, the amount of sediment deposited in the drainage ditches will be reduced. Floodwaters held back by dams will relieve the stress on the levees in the bottomlands and reduce the chances of breaching or overtopping the levees as has happened previously. Reducing sedimentation and the risks of flood damages benefit the landowners in the lowlands and the P-MRNRD because of its commitment to assist with maintenance of the levees.

PIGEON/JONES CREEK WATERSHED LAND USE

Cropland Treatment:

No-till	7,440 acres (37%)
Spring-till	3,302 acres (16%)
Conservation Reserve Program (CRP)	4,268 acres (21%)
Cropland w/ terraces and No-till	532 acres (2.25%)
Cropland w/ terraces and Spring-till	266 acres (1%)
<u>Buffer Strips</u>	<u>59 acres (.5%)</u>
Total Cropland Acres	15,867 acres (77.75%)

“Other” Acres:

Pasture and trees	3,580 acres (18%)
Small Acreages	388 acres (1.5%)
Existing dams	11 acres (.25%)
Roads	410 acres (2%)
<u>Town of Hubbard</u>	<u>60 acres (.5%)</u>
TOTAL ACRES:	20,316 acres (100%)

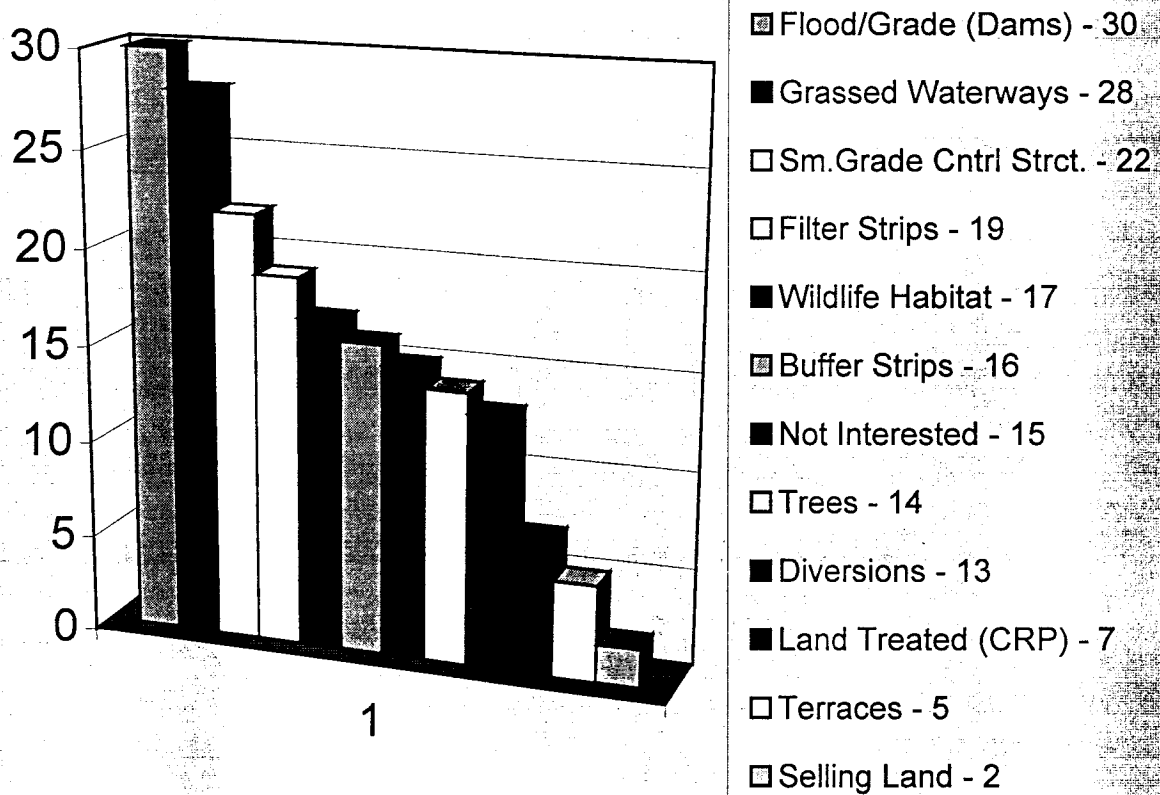
Seventy-eight percent of the cropland in the watershed is being treated with conservation tillage such as no-till and/or spring-till to reduce erosion. This practice is one of the most effective and least expensive of the management practices. A tillage system is classified as “conservation tillage” if it leaves at least 30 percent residue cover on the soil surface after planting. The residue slows the rate of runoff and increases water infiltration into the soil. Greater soil erosion protection is provided as the percentage of residue is increased.

In addition to conservation tillage, structural practices such as flood control, erosion control or grade stabilization dams, terraces, diversions, waterways and water/sediment control basins should be used to provide enduring soil erosion benefits in the uplands of the watershed. Currently only a small portion (approximately 2,500 acres or 12%) of the watershed has these types of conservation measures.

It is estimated that 61,475 tons of sediment per year is being delivered to the lower reaches of the watershed with present cropping practices. Soil loss from cropland averages as high as 29 tons/acre/year with present cropping conditions. Gully erosion is also a major problem due to the steepness of the land and contributes significantly to the sediment load carried from the watershed. It is projected that the sediment load will be reduced by 68% after the project is completed.

A total of 104 surveys with information letters were mailed to landowners and operators January 2000 in the Pigeon and Jones Creek Watershed to gauge their interest in land treatment practices. As of March 2000, seventy-three of the surveys have been returned. The graph shown below illustrates landowner preferences for soil and water conservation practices in this special watershed area.

LAND TREATMENT PRACTICES



The overall response from the surveys was positive and the majority of landowners and operators are interested in supporting and participating in this watershed project on a voluntary basis.

Plan of Action

The Natural Resources Conservation Service (NRCS) in Dakota County has developed a plan to address the erosion, sediment and flooding problems within the Pigeon and Jones Creek Watershed which will also have a direct effect on the Pigeon Creek drainage ditch and adjoining cropland. The following summarizes structural practices as needed to reach 75% land treatment in the watershed:

Goals for Structural Conservation Practices

	Extent *	Estimated Total Cost
Terraces	310,000 feet	\$ 542,500.00
Terraces w/ Underground Outlets	155,000 feet	\$ 750,200.00
Sediment Basins	206 each	\$ 116,390.00
Flood/Grade Stabilization Structures	19 each	\$2,745,000.00
Small Grade Control Structures (no water)	52 each	\$ 130,000.00
Buffer Strips	300 acre	\$ 420,000.00
Conservation Reserve Program (CRP)	600 acre	\$ 480,000.00
		\$5,184,090.00

Funding Sources

Papio-Missouri River NRD	\$2,586,732.40
Pigeon/Jones Creek Landowners	\$ 230,863.50
Dakota County	\$ 604,250.00
Federal (EQIP, CRP, Section 319)	\$1,396,346.50
State (Nebraska Buffer Strip Program and Nebraska Environmental Trust)	\$ 365,897.60
Total	\$5,184,090.00

The cost-share rate for structural measures will be 85% of the county average cost. Grade Stabilization and Sediment Retention Structures will be built by the Papio-Missouri River NRD at no cost to the landowner. The landowner will, however, provide a free easement for the area needed for the structure and pool area and access to the site for maintenance.

Road Structures would replace old bridges and provide safer access for vehicles and farm equipment while stopping further gully erosion. The cost-share rate will be 85% of the project's total construction costs, not to exceed \$125,000 per project. These structures will be built with the cooperation of the Dakota County Roads Department.

Special Project Schedule

Application of land treatment measures and dams will benefit the entire watershed. Long range benefits will include lower sedimentation rates, flood control, and improved water quality. Soil and water conservation practices will help control agricultural runoff and its attendant sediment, fertilizer and pesticides. Small dams with permanent pools of 4 to 8 acres each will control gully and streambank erosion, stabilize grades and trap sediment.

Outside the upland portion of the watershed, benefits will also be realized through the reduction of sediment and flood damages in the bottomlands adjacent to the Pigeon/Creek drainage ditch.

- Install soil conservation measures to control erosion, completed in Fiscal Year 2015.
- Construct Flood Control, Grade Stabilization, and Small Grade Control Structures, see proposed completion schedule Appendix 1.
- Enroll additional 600 acres in the Conservation Reserve Program (CRP), see Appendix 2 for land currently enrolled in CRP.
- Construct Recreation Structure with a permanent pool of 100 acres.

Recreation Structure

Water based recreation is in short supply in Eastern Nebraska and this project provides the opportunity to help satisfy that demand, much as other district projects such as Walnut Creek Lake and Recreation Area have done. A site has been identified (see site no. 15 on the watershed map) where a dam could be built that would create a 200 acre permanent pool. This structure is estimated to cost between \$1,500,000 and \$3,000,000 to build, depending upon the exact location where it is sited. The cost could be shared by the P-MRNRD, Nebraska Game and Parks Commission, Dakota County, Nebraska Department of Natural Resources and others.

Structure Schedule
Pigeon/Jones Creek Watershed
April 10,2002

Year Construction Planned	Structure Number	Drainage Area	Estimated Cost	Year Completed
1999	*11	680 acres	\$120,000	1999
2003	3	165 acres	\$200,000	(Concrete Pipe)
2003	5	700 acres	\$150,000	
2004	4	670 acres	\$150,000	
2004	14	138 acres	\$50,000	
2004	19	45 acres	\$50,000	
2005	9	193 acres	\$50,000	
2005	17	477 acres	\$150,000	
2006	*12	982 acres	\$500,000	
2006	20	596 acres	\$150,000	
2007	1	569 acres	\$100,000	
2007	2	505 acres	\$100,000	
2007	**15	4637 acres	\$3,000,000	(Concrete Pipe)
2008	7	440 acres	\$75,000	
2009	8	358 acres	\$75,000	
2009	10	523 acres	\$150,000	
2010	*18	350 acres	\$75,000	
2011	*6	955 acres	\$150,000	
2011	*13	1175 acres	\$300,000	
2011	*16	600 acres	\$150,000	

*Road Structures (Sites 6, 13 and 16 are not on current County Road Schedule)

**Recreation Site

Appendix 1

Conservation Reserve Program (CRP) acres currently enrolled in the watershed

CRP signup	Acres	Expiration Date
11	6.9	2003
12	31.6	2006
13	205.1	2002
13	1.1	2006
15	8.1	2008
15	508.3	2008
15	135.6	2008
15	73.8	2008
15	142.3	2008
15	71.9	2008
15	163.9	2008
15	20.6	2008
15	66.7	2008
15	67.2	2008
15	142	2008
15	200.7	2008
15	268.6	2008
15	146.1	2008
15	63	2008
15	40.6	2008
15	64	2008
15	46	2008
15	156.7	2008
15	123.2	2008
15	35.1	2008
15	9.2	2008
15	30.2	2008
15	35.2	2008
15	124.1	2008
15	82.2	2008
16	59.9	2009
16	35.1	2009
16	90.8	2009
18	168.1	2010
18	323.7	2010
18	34	2010
18	240.4	2010
18	31.1	2010
18	6.2	2010
18	16.9	2010
18	110.1	2010
18	34.6	2010
18	47.1	2010

Total Acres 4268

Appendix 2