

Begin here by typing in the year. Then tab or place your cursor in each gray shaded field as desired.

Federal Fiscal FY: 2006 Today's Date: 9/19/05

Select project type from the drop-down box below:

Project Type: WATERSHEDS

PROJECT TITLE: Pocasse/Campbell Watershed Assessment Project

PROJECT SPONSOR

NAME: Campbell County Conservation District

ADDRESS: PO Box 153

ADDRESS:

CITY: Mound City STATE: SD ZIP: 57646-0153

PHONE: (605) 955-3514 EXT: 3

FAX: (605) 955-3378 E-MAIL: mary.wiest@sd.nacdnet.net

PRIMARY CONTACT

NAME: Mary Wiest PHONE: 955-3378 EXT: 3

SIGNATORY NAME: PHONE: (OPTIONAL)

STATE CONTACT PERSON:

NAME: Paul Lorenzen

PHONE: 773-4047 EXT:

FAX: (605) 773-4068

E-MAIL: paul.lorenzen@state.sd.us

CATEGORY & FUNCTIONAL CATEGORY

Drop-down lists. Please select up to 4 categories below.

NPS Category and Percent

The primary category of pollution is intended to identify the principal or main pollutant(s) the project is attempting to correct. The selections are obtained from drop-down list associated with the data element.

| NPS CATEGORY | Percent |
|--------------|---------|
| AGRICULTURE | 100 |

NPS Functional Category

These activities are intended to identify the principal or main approach, remedy, or solution to achieve the objective of the project. Selections are obtained from the drop-down list associated with the data element.

| NPS FUNCTIONAL CATEGORY OF ACTIVITY |
|-------------------------------------|
| WATERSHED ASSESSMENTS |

WATERSHED NAME: Spring Creek

USGS HYDROLOGICAL UNIT CODE: 10130102

LATITUDE/LONGITUDE

Use degrees and decimals only. Do not put in degrees, minutes, seconds. For example: put in 45.55 rather than 45 deg 30 min 30 sec.

PROJECT LOCATION LATITUDE: 45.86 LONGITUDE: -100.22

WATERBODY TYPE

A name indicating the type of waterbody/watershed associated with the NPS project.

RIVERS/STREAMS
RESERVOIRS

TMDL AND CLEAN LAKES INFORMATION

A field that identifies the relationship of the given nonpoint source project's funding to total maximum daily load (TMDL) activities.

TMDL PRIORITY: LOW
TMDL DEVELOPMENT?: YES
TMDL IMPLEMENTATION?: NO

CLEAN LAKES PROJECT?: NO

POLLUTANT TYPE

The name of the pollutant that the particular nonpoint source project is attempting to address. Selection of the pollutant is made from drop-down list.

Pollutants not listed in POLLUTANTS box if needed. Selection of the pollutant is made from the drop-down list.

POLLUTANTS:
PHOSPHORUS

ADDITIONAL POLLUTANTS:

FUNDING

PLEASE TAB OUT OF THE FIELD AFTER ENTRY

FY\$319(h) BUDGET FUNDS: \$120,000

NON-FEDERAL MATCHING FUNDS: \$80,000

OTHER FEDERAL FUNDS:

STATE FUNDS: \$40,000

LOCAL FUNDS: \$40,000

TOTAL BUDGET: \$200,000

OTHER FUNDS:

STATE 319(h) FTE's FUNDED UNDER THIS GRANT: 0.75

GOALS AND PROJECT DESCRIPTION

NOTE: To add the GOALS and PROJECT DESCRIPTION just TAB to the shaded area and type or cut/paste text. You may type or cut/paste as much text as you like. The box will expand.

Narrative fields used to provide the anticipated benefits and goals of the project and the project description.

GOALS: The goal of this project is to collect sufficient data for the completion of TMDLs for both Lake Campbell and Lake Pocasse in Campbell County. This will be accomplished by locating and documenting sources of impairments in the Spring Creek watershed and developing feasible alternatives for restoration. The data collected and subsequent TMDL (written by DENR) will provide sufficient background information to develop a watershed restoration project.

PROJECT DESCRIPTION: Spring Creek drains portions of Campbell and McPherson Counties and is the primary tributary to Lake Pocasse in Campbell County. Lake Campbell, also located within the Spring Creek watershed, contributes outflow that eventually reaches Lake Pocasse. The Spring Creek watershed is dominated by agricultural with grazing and cropland as the major land use. Spring Creek receives runoff from agricultural operations and both reservoirs require a TMDL for TSI (nutrients) as listed in the 2004 Integrated Report.

PROJECT SUMMARY SHEET

PROJECT TITLE NAME: Pocasse/Campbell Watershed Assessment Project

NAME AND ADDRESS OF LEAD PROJECT SPONSOR:

Campbell County Conservation District
P.O. Box 153
Mound City, SD 57646-0153

STATE CONTACT PERSON: Paul Lorenzen TITLE: Environmental Program Scientist

523 East Capitol
Pierre SD. 57501
PHONE: (605)773-4047 FAX: (605)773-4068

STATE: South Dakota

WATERSHED: Missouri River Basin
HUC #10130102

PROJECT TYPES : BASE WATERSHED GROUNDWATER I&E

WATERBODY TYPES

- Groundwater
- Lakes/Reservoirs
- Rivers
- Streams
- Wetlands
- Other

NPS CATEGORY

- Agriculture
- Urban Runoff
- Silviculture
- Construction
- Resource Extraction
- Stowage and Land Disposal
- Hydrologic Modification
- Other

PROJECT LATITUDE 45.86

LONGITUDE -100.22

SUMMARIZATION OF MAJOR GOALS:

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FY-06 319 funds requested \$120,000

Other Federal Funds \$0

Match \$80,000

Total project cost \$200,000

2.0 STATEMENT OF NEED

- 2.1** The purpose of this assessment is to locate the sources of impairment to Lake Campbell and Lake Pocasse in Campbell County, South Dakota, and the tributaries in their watersheds. Both subwatersheds are encompassed in the cumulative Spring Creek watershed which ultimately drains into the Missouri River. Spring Creek and its tributaries are streams which provide loadings of sediment and nutrients to the lakes.
- 2.2** Spring Creek and its numerous intermittent drainages are tributaries to Lake Pocasse and Lake Campbell. The stream network drains a combination of grazing and cropland acres. Feeding areas for livestock are present in the watershed. Tributaries including the main stem of Spring Creek carry sediment and nutrient loads, which degrade water quality in both lakes resulting in increased eutrophication.
- 2.3** The watershed is located in north central South Dakota and is approximately 500,000 acres (Figure 1).
- 2.4** Land use in the watershed is primarily agricultural consisting of corn, wheat, and hay as the principle crops with beef cattle composing the majority of the livestock produced in the region.

The primary soil associations in the region are Opal-Sansarc-Promise, Lihen-Flasher, Farnuf-Grail, Bryant-Grassna, Linton-Grassna, Lehr-Bowdle, Tally-Maddock, Yecross-Maddock, Vida-Williams and Williams-Bowbells.

The average annual precipitation in the watershed is 16 inches, most of which falls in the late spring and early summer. The area is occasionally subject to storms of moderate to severe intensity. The storms are often short in duration and can produce locally heavy rainfall.

Both reservoirs have relatively good public access. Accommodations on both reservoirs include picnic tables, restroom facilities, shore fishing and boat ramp access.

- 2.5** Both Lake Pocasse and Lake Campbell were listed in the 2004 Integrated Report for higher than acceptable Trophic State Index (TSI) levels. TSI levels used to determine impairment were an average of Carlson's (1977) TSI equations for chlorophyll *a*, Secchi depth and phosphorus based on data collected during the growing seasons from 1994 through 2004. Reservoirs typically become more eutrophic faster than natural lakes. This project will attempt to separate natural and anthropogenic causes of impairment. Phosphorus is typically the limiting nutrient in the growth of nuisance algal blooms. The source and amount of phosphorus will be tracked throughout the watershed and a determination will be made on the amount that can be reduced.
- 2.6** Federally listed threatened and endangered species within the project area include the bald eagle (Haliaeetus leucocephalus) (threatened), whooping crane (Gras Americana) (endangered), piping plover (Charadrius melodus) (threatened, critical habitat), least tern (Sterna antillarum athalassos) (endangered). The piping plover and the least tern are found on the Missouri Reservoir. It is unlikely these species will be encountered. The bald eagle and the whooping crane are not likely to be impacted by this project.

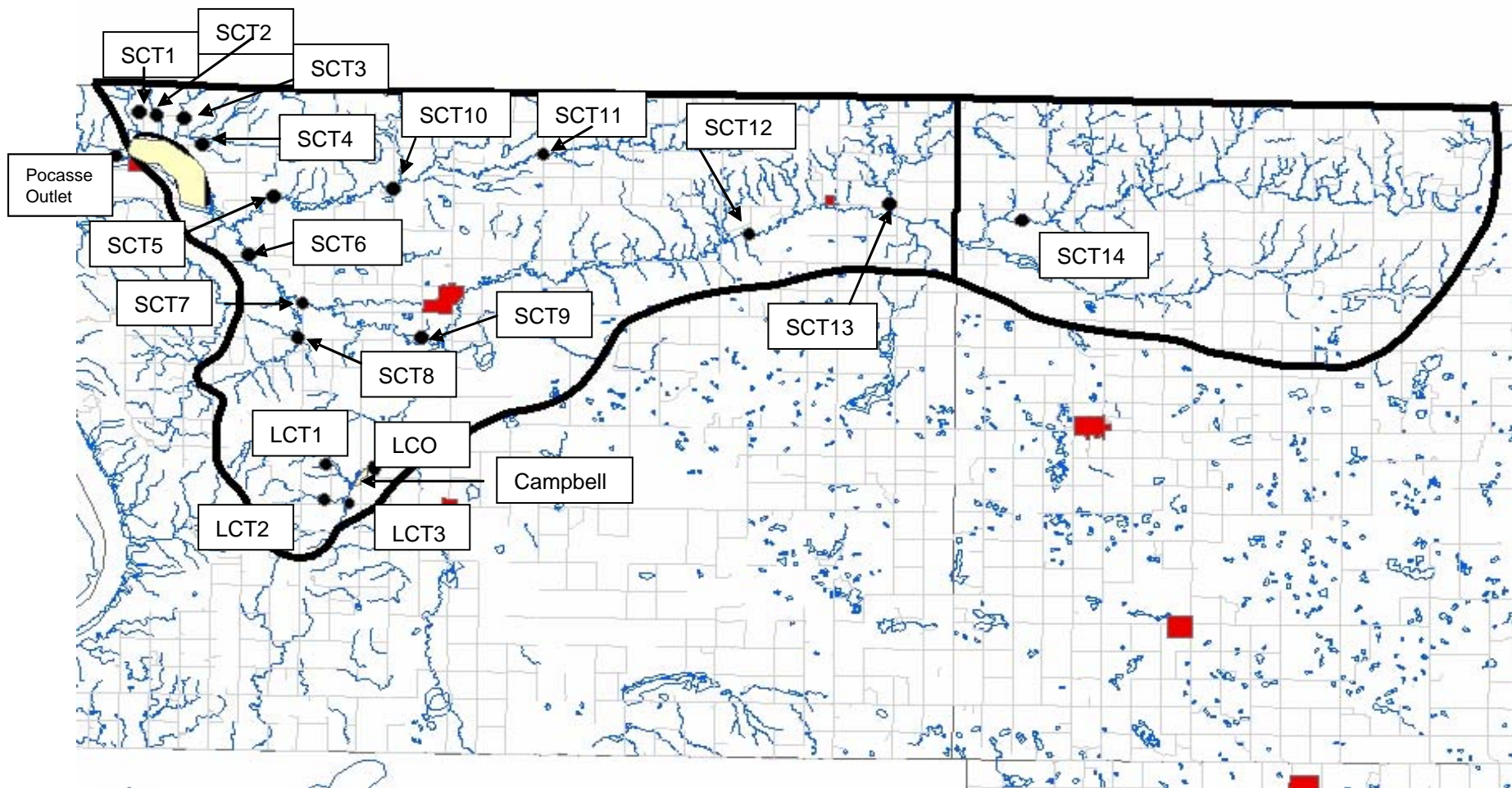


Figure 1. Spring Creek Watershed and Location in the State

PROJECT DESCRIPTION

3.1 GOALS

The goal of this project is to collect sufficient data for the completion of TMDLs for both Lake Campbell and Lake Pocasse in Campbell County. This will be accomplished by locating and documenting sources of impairments in the Spring Creek watershed and developing feasible alternatives for restoration. The data collected and subsequent TMDL (written by DENR) will provide sufficient background information to develop a watershed restoration project.

3.2 OBJECTIVES AND TASKS

OBJECTIVE 1: Collect water quality data for the evaluation of current water quality conditions and calculate the trophic state of each reservoir. DENR will use this information to determine the total amount of nutrient trapping that is occurring in each of the reservoirs and the amount of nutrient reduction required to improve the trophic condition of both Lake Campbell and Lake Pocasse.

TASK 1: Collect water quality data in both Lake Pocasse and Lake Campbell.

Nutrient and solids parameters will be sampled at three basin sites on Lake Pocasse (Fig 2) and two basin sites on Lake Campbell (Fig 3). Only surface samples will be collected from both sites on Lake Campbell. Samples on Lake Pocasse will be collected from the surface and bottom at the two sites north and west of highway 10 and a surface sample will be collected at the remaining site south and east of highway 10. Samples will be collected on a monthly basis for a two year period. The lake will be sampled except during periods of unsafe ice cover. During June, July and August, samples will be collected bi-monthly. A total of 182 reservoir samples will be collected during the project period. All samples will be collected using the methods described in the SD DENR Standard Operating Procedures for Field Samplers (SDWRAP SOP). The South Dakota State Health Laboratory in Pierre will analyze most samples. DENR will analyze chlorophyll a.

The purpose of the lake samples is to assess ambient nutrient concentrations and identify trophic states in the reservoirs. Water column dissolved oxygen and temperature profiles will be collected with a submersible data sonde. Algae samples will be collected during the project period to assist in documenting eutrophication. Water samples will be collected with a Van Dorn Sampler and the sample bottles will be shipped to the state health lab by the most rapid means available. The following paragraph lists the parameters to be sampled. Physical measurements will be collected by field staff. Chemical and some biological parameters (Fecal coliform and E. Coli) will be analyzed by the State Health Lab. Other biological samples (Chlorophyll a and Algae) will be analyzed by staff from Watershed Protection Program.

BASIN PARAMETERS MEASURED

| <u>Field Measurements</u> | <u>Chemical</u> | <u>Biological</u> |
|---------------------------|----------------------------|----------------------|
| Air Temperature | Total Alkalinity | Fecal Coliform |
| Water Temperature | Total Solids | <i>E coli</i> |
| Secchi Transparency | *Total Dissolved Solids | Chlorophyll <i>a</i> |
| Depth | Total Suspended Solids | |
| Visual Observations | Ammonia | |
| Field pH | *Un-ionized Ammonia | |
| Dissolved Oxygen | Nitrate | |
| | Total Kjeldahl Nitrogen | |
| | Total Phosphorus | |
| | Total Dissolved Phosphorus | |

* Calculated Values

Reservoir Sampling Locations - Lake Pocasse

LP-1 This site is located in the middle of the basin south of Highway 10.

LP-2 This site is located in the southern portion of the basin north of Highway 10.

LP-3 This site is located in the northern portion of the basin north of Highway 10.

Reservoir Sampling Locations - Lake Campbell

LC-1 This site is located in the upstream portion of the basin.

LC-2 This site is located in the downstream portion of the basin near the dam.

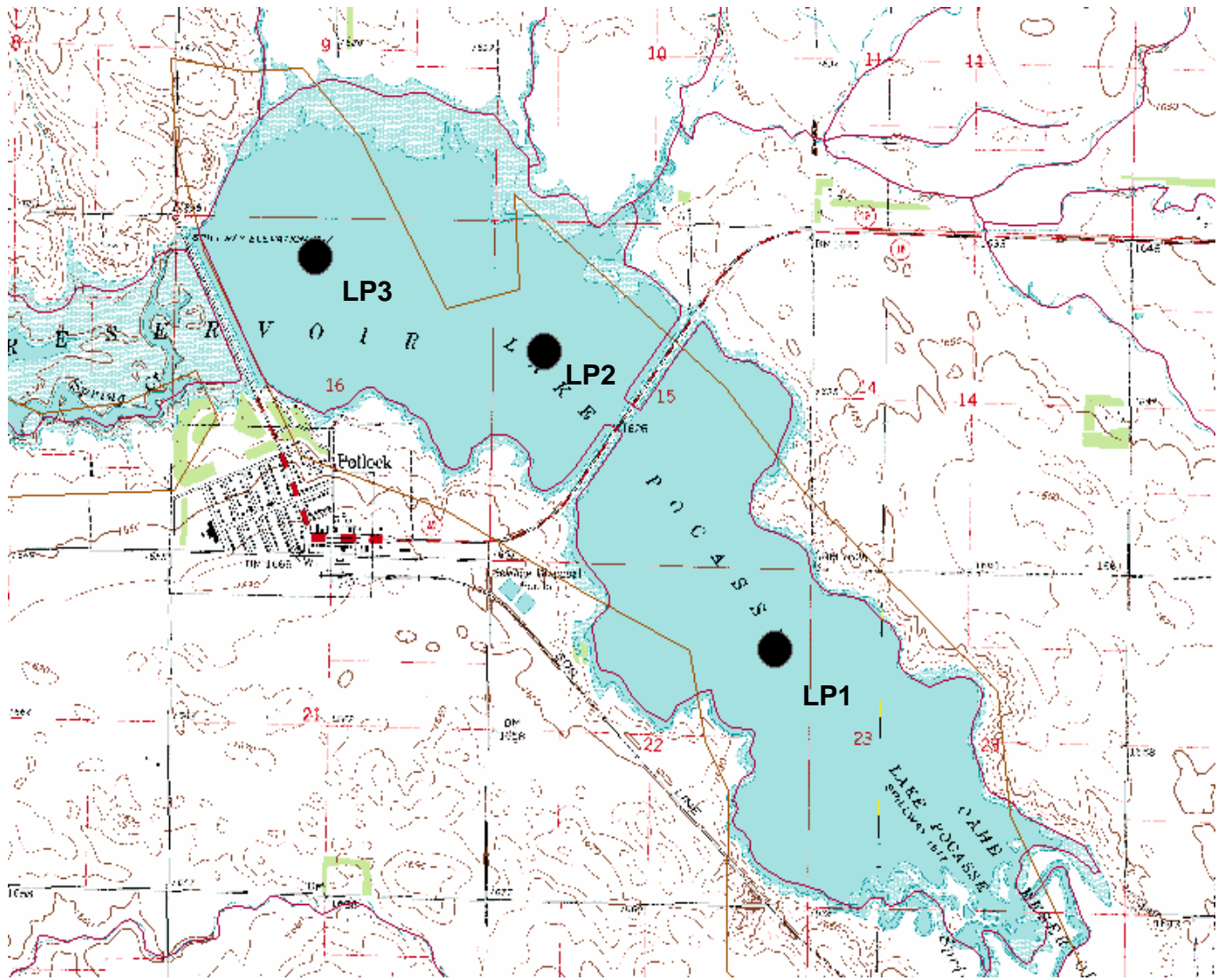


Figure 2. Lake Pocasse Sampling Locations.

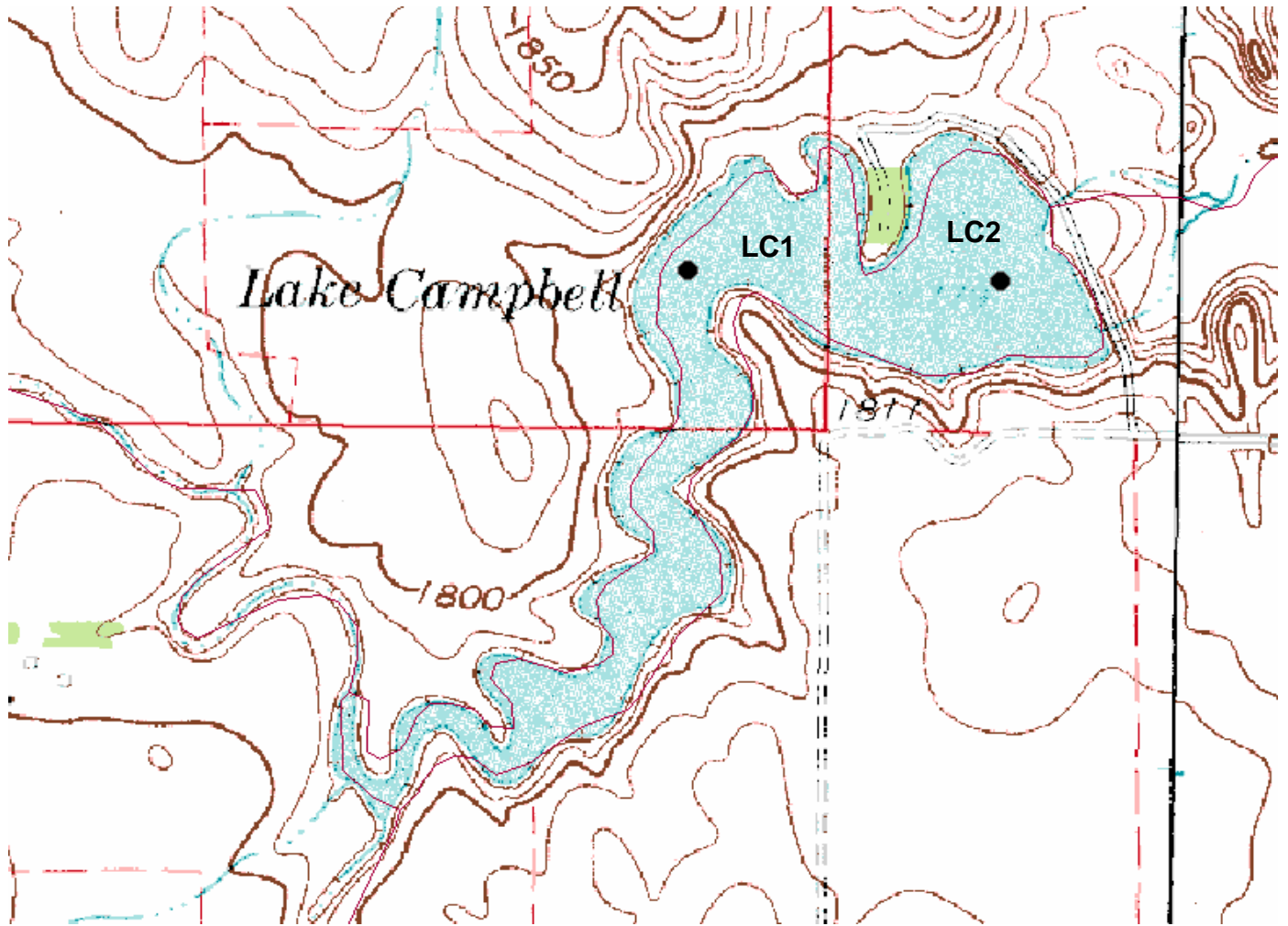


Figure 3. Lake Campbell Sampling Locations.

TASK 2: Reservoir Sediment Survey.

Sediment depth will be measured on both Lake Pocasse and Lake Campbell during ice covered periods. Survey transects will be spaced at approximately 200 feet. A depth sounding and sediment probe, using a length of rebar, will be completed along each transect. The results of the survey will be used to calculate the volume of soft sediment in the reservoirs and to create a bathymetric map of each reservoir.

An elutriate sample will be collected from a point near the center of each reservoir to determine the presence or absence of contaminants in the bottom sediments.

TASK 3: Reservoir Shoreline Survey.

The shoreline of both reservoirs will be assessed once during the project to characterize shoreline stability. Visual estimates of erosion areas and erosion potential will be documented.

TASK 4: Reservoir Macrophyte Survey.

A macrophyte survey will be completed- during July 2007 to determine species composition and abundance of the macrophyte communities of both reservoirs. Methods will follow the SDWRAP SOP.

PRODUCTS:

Water quality data collected for both reservoirs.
A bathymetric sediment map of both reservoirs.
Macrophyte and shoreline survey report for both reservoirs.

RESPONSIBLE AGENCIES:

Task Prioritization:

Project Sponsor/Coordinator
DENR

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

COST: \$37,580 319 COST- Est. \$20,000

OBJECTIVE 2:

Collect sediment and nutrient loading data from Spring Creek and the its tributaries through hydrologic and chemical monitoring. The information will be used to locate critical areas in the watershed to be targeted for nutrient and/or sediment reduction.

TASK 5: Develop hydrographs for the tributary sites within the project.

Install water level recorders at 17 tributary monitoring sites and 2 reservoir outlets (Fig 1) and maintain a continuous stage record for the project period, except during winter months after freeze up.

Tributary Site Locations

| Site | Latitude | Longitude | Site | Latitude | Longitude |
|-------------|-----------------|------------------|-------------|-----------------|------------------|
| SCT-1 | 45.929 | -100.289 | SCT-11 | 45.910 | -100.006 |
| SCT-2 | 45.928 | -100.277 | SCT-12 | 45.885 | -99.764 |
| SCT-3 | 45.926 | -100.259 | SCT-13 | 45.886 | -99.764 |
| SCT-4 | 45.913 | -100.245 | SCT-14 | 45.877 | -99.672 |
| SCT-5 | 45.885 | -100.195 | LCT1 | 45.745 | -100.154 |
| SCT-6 | 45.855 | -100.212 | LCT2 | 45.726 | -100.155 |
| SCT-7 | 45.830 | -100.173 | LCT3 | 45.724 | -100.138 |
| SCT-8 | 45.812 | -100.175 | LCO | 45.744 | -100.122 |
| SCT-9 | 45.812 | -100.089 | LPO | 45.905 | -100.305 |
| SCT-10 | 45.891 | -100.111 | | | |

Discharge measurements will be taken on a regular schedule and during storm surges to provide adequate stage/discharge relationship for each site. Discharge measurements will be taken with a hand held current velocity meter.

Discharge measurements and water level data will be used to calculate a hydrologic budget for the Spring Creek drainage network. This information will be used with concentrations of sediment and nutrients to calculate loadings from the watershed.

TASK 6: Collect water quality samples

Collect water quality samples at 19 tributary monitoring stations using a combination of sites thought to contribute the greatest influence to both reservoirs and the main stem profile of Spring Creek including influences from North Dakota.

Samples will be collected during spring runoff, storm events, and monthly base flows. Approximately 170 water samples will be collected during the project period. Sites located further upstream in the watershed typically have less flow and will have fewer samples collected than sites downstream of the larger drainages. In addition, five outlet samples will be collected at both reservoirs totaling 10 samples for a cumulative estimate of 180 tributary samples.

Nutrient and solids samples will be collected twice weekly during the first week of spring snowmelt runoff and once a weekly thereafter until runoff ceases. Storm events and base flows will be sampled throughout the project period for an estimated total of 180 samples.

Water samples will be collected using an integrated sediment sampler when possible. All sample bottles will be packed with iced and shipped to the lab and collected using the methods described in the SDWRAP SOP. The South Dakota State Health Laboratory in Pierre, SD, will analyze all chemical parameters plus *E. coli* and fecal coliform. For the TMDL, the water quality data will be integrated together with the hydrologic loadings to provide a complete analysis of the Spring Creek system.

PARAMETERS MEASURED FOR TRIBUTARY SAMPLES:

| FIELD MEASUREMENTS | CHEMICAL | BIOLOGICAL |
|---------------------------|----------------------------|-------------------|
| Air Temperature | Total Alkalinity | Fecal Coliform |
| Water Temperature | Total Solids | <i>E Coli</i> |
| Discharge | *Total Dissolved Solids | |
| Depth | Total Suspended Solids | |
| Visual Observations | Ammonia | |
| Water Level | *Un-Ionized Ammonia | |
| Field pH | Nitrate | |
| Dissolved Oxygen | Total Kjeldahl Nitrogen | |
| | Total Phosphorus | |
| | Total Dissolved Phosphorus | |
| * Calculated Values | | |

PRODUCTS:

Tributary water quality data collected.
Hydrologic data and stage data will be tabulated for each site.

RESPONSIBLE AGENCIES:

Task Prioritization:

Project Sponsor/Coordinator
DENR

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

COST: \$34,200 319 COST- Est. \$20,000

OBJECTIVE 3: Complete a habitat assessment and macroinvertebrate biosurvey. This data will be used to compliment physiochemical data and help define areas of degradation along the profile of Spring Creek.

TASK 7: Habitat assessment

Complete a habitat assessment at six main stem sites along the profile of Spring Creek once each year to document the health of channel, bank and riparian characteristics.

TASK 8: Macroinvertebrate biosurvey

Macroinvertebrate samples will be collected at each of the six predetermined habitat assessment reaches twice yearly over the course of the project for a total of 24 samples.

Due to intermittency, macroinvertebrates will be collected during a period with optimal hydrologic condition to ensure the probable presence of optimal aquatic life stages. Historic USGS gage station data will be used to determine an optimal hydrologic index period to collect macroinvertebrates. Macroinvertebrate samples will be collected twice a year during both years of the study to account for within and between year variability. The habitat data will be used to quantify stream condition and explain variability in macroinvertebrate attributes.
Habitat and macroinvertebrate sampling will follow protocols stated in the SDWRAP SOP Vol. II.

PRODUCTS:

Habitat and biological data provided to the SD DENR.

RESPONSIBLE AGENCIES:

Task Prioritization:

Project Sponsor/Coordinator
DENR

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources
Invertebrate identification: Contract with Consulting Firm

COST: \$5,400 319 COST- Est. \$0

OBJECTIVE 4: Ensure that all water quality and biological samples are accurate and defensible through the use of Department approved Quality Assurance/ Quality Control procedures.

TASK 9: Collect required QA/QC samples.

The collection of all field water quality data will be accomplished in accordance with the SDWRAP SOP.

A minimum of 10 percent of all the water quality samples collected will be QA/QC samples. QA/QC sample sets will consist of a field blanks and a field duplicate sample. An estimated 36 sample sets will be collected during the project. All QA/QC activities will be conducted in accordance with the Nonpoint Source Program Quality Assurance Project Plan.

PRODUCTS:

A Quality Assurance/ Quality Control monitoring report.

RESPONSIBLE AGENCIES:

Task Prioritization:

Project Sponsor/Coordinator

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

COST: \$13,680 319 COST- Est. \$0

OBJECTIVE 5: Evaluation of agricultural impacts to the water quality of the watersheds through the use of the Annualized Agricultural Non Point Source (AnnAGNPS) Model.

TASK 10: The Spring Creek watershed will be modeled using the AnnAGNPS model. AnnAGNPS is a comprehensive landuse model, which predicts soil erosion and nutrient transport/loading risks for agricultural watersheds.

Required data layers for the execution of this model include landuse, soils, topography, and hydrology. Collection of this data will be determined by the availability and accuracy of available data layers.

PRODUCTS:

Electronic files of completed AnnAGNPs model.

RESPONSIBLE AGENCIES:

Task Prioritization

Project Sponsor/Coordinator

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

319 COST- Est. \$0

OBJECTIVE 6: Public participation and involvement.

TASK 11: Informational meetings will be held to inform the project partners and the general public of project progress. The meetings will provide an avenue for input from the area residents. It is anticipated that the project coordinator will be asked to present information at these meetings.

News releases will be prepared and sent to the local news media on a quarterly basis. These releases will be provided to the local newspapers, radio stations and TV stations if available.

PRODUCTS:

2 news releases.
6 meetings

RESPONSIBLE AGENCIES:

Task Prioritization

Project Sponsor/Coordinator

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

319 COST- Est. \$0

OBJECTIVE 7: Reporting Provide reports as part of state and federal grant requirements.

TASK 12: Progress Reports

The local sponsor will use the SD DENR Project Tracking Program to track project objectives and expenditures. Annual and semi-annual progress reports (GRTS) will be completed and presented at the appropriate general public meetings to keep the involved parties up-to-date with work activities and ensure their timely completion. These GRTS

reports, as required by EPA, will be submitted to DENR on April 1 and October 1 of every year until the project contract has expired.

TASK 13: Final Report

The local sponsor will produce a final report of the tasks and Objectives listed in this work plan. The report will follow the EPA guidance for final reports format. <http://www.epa.gov/owow/nps/sec-319.pdf> The final report will include a summary of all activities during the project as well as the data collected during the project.

Development of a the TMDL (including remediation activities) summary for the parameters included on the 2004 Integrated Report list and any other parameters that may need a TMDL will be completed by DENR through other funds.

PRODUCTS:

Use of the DENR Project Tracker Program
Semi-annual and annual progress reports for GRTS
Data provided to DENR in electronic format
Final project report

RESPONSIBLE AGENCIES:

Task Prioritization

Project Sponsor/Coordinator
DENR

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

319 COST- Est. \$0

- 3.3 MILESTONE TABLE – See-attached milestone.
- 3.4 No special permits are required to do this assessment project.
- 3.5 The Campbell County Conservation District is the appropriate lead project sponsor for this project. The Campbell County Conservation District boundary encompasses a large portion of the involved watershed. The Campbell County Conservation District is important to this project because of their relationship with watershed landowners. A significant portion of the watershed also extends into McPherson County, South Dakota and Emmons and McIntosh Counties in North Dakota. The local sponsor and project officer will work with the proper state and local natural resource agencies to accomplish the objectives and tasks of this assessment project

4.0 **COORDINATION PLAN**

4.1 The following groups/agencies have agreed through an informal agreement to cooperate in the Spring Creek Watershed Assessment Project.

Campbell County Conservation District – Local Project Sponsor and financial assistance

McPherson County Conservation District – Local support and financial assistance

North Central Rural Conservation and Development – Technical assistance

US Natural Resource Conservation Service – Local support and technical assistance

Conservation Commission – Financial assistance

US Fish and Wildlife Service – Local support and biological evaluation review

US Environmental Protection Agency – Financial and technical assistance

South Dakota Department of Environment and Natural Resources – Financial and technical assistance

South Dakota Games Fish and Parks – Lake, fishery and park information

North Dakota Department of Health – Financial and technical assistance

Emmons and McIntosh Conservation Districts – Local support

4.2 This project will coordinate activities with state, federal, and local government agencies through monthly project meetings.

4.3 There currently are no other agencies conducting assessment activities in the Spring Creek Watershed.

5.0 EVALUATION AND MONITORING PLAN

5.1 The monitoring strategy is explained in Section 3. The project will produce Semi-annual progress reports. The sampling and analysis procedures required to complete the tasks within Section 3 can be located in the Standard Operating Procedures for Field Samplers for the South Dakota Nonpoint Source Program (SOP). The specific locations of these sampling methods within SOP as they pertain to each task are documented in Table 1 on the following page.

Table 1. Location of sampling and analysis procedures for each applicable task involved with the Spring Creek Watershed Assessment Project.

| TASK NUMBER | TASK DESCRIPTION | ACTIVITY | REFERENCE IN SDWRA-2005 SOP |
|-------------|--------------------------------------|--|-----------------------------|
| Task 1 | Collect basin water quality samples. | Water Quality Sampling | Vol I Section 14.0 |
| Task 2 | Elutriate Sample | Sediment Sample | Vol I Section 18.0 |
| Task 3 | Shoreline Survey | Shoreline measurements | Vol II Section 2.0 |
| Task 4 | Macrophyte Survey | Macrophyte composition | Vol II Section 2.0 |
| Task 5 | Developing hydrographs. | Discharge measurements | Vol I Section 12.0 |
| Task 6 | Collect stream water quality samples | Water Quality Monitoring | Vol I. Section 12.0 |
| Task 7 | Qualitative Habitat Assessment | Channel , bank and riparian assessment | Vol II. Section 9.0 |
| Task 8 | Macroinvertebrate Biosurvey | Macroinvertebrate Sampling | Vol II. Section 6.0 |
| Task 9 | Collect QA/QC data | Quality Assurance | Vol I Section 8.0 |
| Task 10 | Use of the ANNAGNPS computer model | Watershed Modeling | Vol I Section 13.0 |

- 5.1 All water quality monitoring will be completed in accordance with the approved South Dakota Nonpoint Source Quality Assurance/ Quality Control Project Plan and the Standard Operating Procedures for Field Samplers for the South Dakota Watershed Protection Program. Samples will be sent to an EPA approved laboratory (SD State Health Lab).
- 5.2 Site selection for this project was based on a targeted design to determine sources of impairment in the watershed and the condition of the reservoirs. The sample plan includes a combination of chemical, hydrologic, and biological sampling. Land use modeling will be used to further target sources of nutrients and sediment in the watershed. Discrete samples may be collected if determined that the effort will lead to more refined targeting in the watershed. Base flow samples will be collected along with spring runoff and storm events throughout the project period. Stream discharge will be routinely measured for use in the calculation of nutrient and sediment loads.
- 5.3 Results from all water quality monitoring efforts completed during the Spring Creek Watershed Assessment Project will be reported in the final project report. Data will be managed by the South Dakota Department of Environment and Natural Resources and maintained in a computer database. All sample data will be entered in the US EPA STORET Program. This data will be used as the foundation for development of a Section 319 Watershed Implementation Project proposal.
- 5.4 AnnAGNPS will be used to model the watershed. AnnAGNPS model was developed by the Agricultural Research Service (USDA). FLUX will be used to model the nutrient and sediment loads to the lake. BATHUB will be used to model the trophic status of the lake and its response to reduction of loading. FLUX and BATHUB are Coprs of Engineer models.
- 5.5 The lakes sampled in this project will continue to be sampled as part of the SD Statewide Lakes Assessment. In this program, lakes are sampled every fourth year.

6.0 Budget: PART 1 FUNDING SOURCE

Table 2. Spring Creek Budget by Source.

| SPRING CREEK WATERSHED ASSESSMENT PROJECT BUDGET | | | |
|---|-----------------|------------------|------------------|
| | YEAR 1 | YEAR 2 | TOTAL |
| EPA SECTION 319 FUNDS | \$60,000 | \$60,000 | \$120,000 |
| DENR FEE FUNDS | \$20,000 | \$20,000 | \$40,000 |
| CONSERVATION COMMISION | \$9,000 | \$9,000 | \$18,000 |
| CAMPBELL COUNTY CONSERVATION DISTRICT | \$7,450 | \$11,050 | \$18,500 |
| MCPHERSON COUNTY CONSERVATION DISTRICT | \$1,750 | \$1,750 | \$3,500 |
| TOTAL BUDGET | \$98,200 | \$101,800 | \$200,000 |

Budget Part II. Table 3. Spring Creek Watershed Assessment Budget by Task.

| | Year 1 | Year 2 | 319 funds | DENR fee Funds | Cash Match | Total |
|---|-----------------|------------------|------------------|-----------------------|-------------------|------------------|
| 1) Salary/Benefits 1 @ \$15/hr 12% benefits | \$35,000 | \$35,000 | \$70,000 | | | \$70,000 |
| 2) Administration | \$2,000 | \$2,000 | | \$4,000 | | \$4,000 |
| 3) Travel | \$6,000 | \$6,000 | | | \$12,000 | \$12,000 |
| 4) Equipment | \$10,000 | \$10,000 | \$10,000 | \$10,000 | | \$20,000 |
| 5) Shipping and Supplies | \$1,200 | \$1,200 | | | \$2,400 | \$2,400 |
| 6) Contingencies | \$370 | \$370 | | \$370 | \$370 | \$740 |
| Objective 1: Lake Sampling | | | | | | |
| Lab Analysis: 182 samples@\$190 | \$17,290 | \$17,290 | \$20,000 | \$7,290 | \$7,290 | \$34,580 |
| Elutriate Lab Analysis: 2 @ \$1500 | - | \$3,000 | | \$1,500 | \$1,500 | \$3,000 |
| Objective 2: Stream Sampling | | | | | | |
| Lab Analysis: 180 samples@\$190 | \$17,100 | \$17,100 | \$20,000 | \$4,200 | \$10,000 | \$34,200 |
| Objective 3: Macroinvertebrate Biosurvey | | | | | | |
| Lab Analysis: 24 samples@\$200 | \$2,400 | \$2,400 | | \$2,480 | \$2,320 | \$4,800 |
| Voucher collection: | | \$300 | | \$300 | | \$300 |
| Quality Assurance: | | \$300 | | \$300 | | \$300 |
| Objective 4: QA/QC | | | | | | |
| Lab Analysis: 36 sample sets@ \$380 | \$6,840 | \$6,840 | | \$9,560 | \$4,120 | \$13,680 |
| Objective 5: Land Use Modeling* | | | | | | |
| Objective 6: Public Participation* | | | | | | |
| Objective 7: Reporting* | | | | | | |
| TOTAL | \$98,200 | \$101,800 | \$120,000 | \$40,000 | \$40,000 | \$200,000 |

* Costs for these tasks are included in items 1 – 5 at the top of the table.

Table 4. Spring Creek Watershed Assessment Milestone Table.

| OBJECTIVE / TASK | TASK | GROUP | QTY | 2006 | | | | 2007 | | | | | | | | | | | | 2008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|-------|---------------------------------|------|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 1 Lake Sampling | 1 | 1,2 | 182 samples | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Elutriate Samples | 2 | 1,2 | 2 samples | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Macrophyte Survey | 3 | 1,2 | 2 surveys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shoreline Survey | 4 | 1,2 | 2 surveys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 2 Tributary Sampling | 5,6 | 1,2 | 180 samples | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 3 Habitat/Invertebrate | 7,8 | 1,2,3 | 12 habitat 24 macro | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 4 QA/QC | 9 | 2,3 | 36 samples | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 5 Watershed Modeling | 10 | 1,2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 6 Public Participation | 11 | 1 | 2 News Letters 6 meetings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objective 7 Annual | 12 | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mid Year | 12 | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Final | 13 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

GROUPS -- 1 – Sponsor, 2 – SD DENR, 3 – Contractor

SOUTH DAKOTA NONPOINT SOURCE PROGRAM
QUALITY ASSURANCE PROJECT PLAN

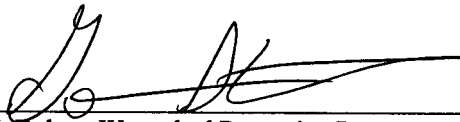
SUBMITTED BY:

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF FINANCIAL AND TECHNICAL ASSISTANCE
WATER RESOURCES ASSISTANCE PROGRAM

Prepared by: Robert Smith
February 2001

Project Title: Pocasse/Campbell Watershed Assessment

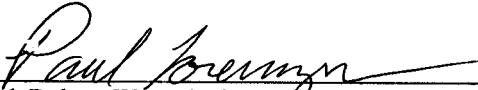
APPROVED BY:



South Dakota Watershed Protection Program
Environmental Senior Scientist, Assessment Section

2-3-06

Date



South Dakota Watershed Protection Program
Project Officer

2-6-06

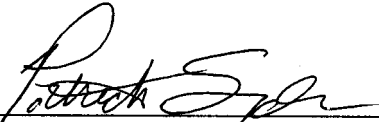
Date



South Dakota Watershed Protection Program
Quality Assurance Coordinator

2-6-06

Date



South Dakota DENR Quality Assurance Officer

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Date