Careless Creek Sampling and Analysis Plan

2009-2012

Approvals:

_____	_____
Shirley Parrott (Lower Musselshell CD)	Date
_____	_____
Mark Ockey (MT DEQ, Watershed Protection Section)	Date
_____	_____
Mark Bostrom, (MT DEQ, QA Officer)	Date

Prepared by: Montana State University Extension Water Quality

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1.0 INTRODUCTION & BACKGROUND

Site History: Careless Creek is a tributary to the Musselshell River, located in central Montana within Golden Valley County (USGS HUC 10040201). Careless Creek is sourced from the Big Snowys and the Little Belt mountain ranges and traverses approximately 100 miles from its' headwaters to its' confluence with the Musselshell. Irrigated agriculture and livestock grazing are the principal land uses within the watershed. A large portion of flow within the lower portion Careless Creek during the summer irrigation season comes from Deadman's Basin Reservoir as the creek is used as a conveyance for irrigation water from the Reservoir to the Musselshell River. The lower 15.5 miles of Careless Creek from Deadman's Basin Reservoir's Careless Canal to the Musselshell River has been listed on the 303(d) list. This lower section is classified as a C3 water body. Waters with this classification are suitable for bathing, swimming, recreation, and the growth and propagation of non-salmonid fish and associated aquatic life, but are considered naturally marginal for agriculture and drinking water uses. In 1988 Careless Creek was listed in the Montana Non-point Source Assessment Report as being moderately to severely impaired, with the primary pollutants being sediment and salts. It has been listed on 303(d) lists since that time. The 2006 303(d) lists the creek as partially supporting of aquatic life and warm water fishery. Probable causes listed are alteration in stream-side or littoral vegetative covers and sedimentation/siltation, while probable sources include channel erosion/incision from upstream hydromodifications, impacts from hydrostructure flow regulation/modification, and streambank modifications/destabilization. The Careless Creek watershed steering committee was formed in 1992 and has done much work to tackle problems within the watershed. This work has included infrastructure improvements in the water delivery system from Deadman's Reservoir which allowed for a reduction in irrigation releases to 100 cubic feet per second (cfs) at the Careless Creek diversion and 80 cfs at the confluence of Careless Creek with the Musselshell River, designed to reduce bank erosion. Additionally a canalized section of the stream was diverted back to its original meandering channel along with bank sloping and tree revetment projects. Agricultural BMPs were also implemented within the watershed including riparian fencing, prescribed grazing, and off-stream watering.

Regulatory Framework: This monitoring protocol seeks to assess current water quality and determine to what extent restoration activities completed as part of the Careless Creek Water Quality Restoration Plan (Montana DEQ, 2001) have changed water quality conditions.

Summary of Previous Investigations: In addition to the TMDL completed (Careless Creek Water Quality Restoration Plan) in 2001, several other reports/investigations have been completed. Known data reports and data collections/sources for Careless Creek are listed below.

- Musselshell River Basin and Careless Creek Watershed Coordinated Watershed Plan (B. Milton, A. Sellars, Careless Creek Watershed Coordinators, 1998)

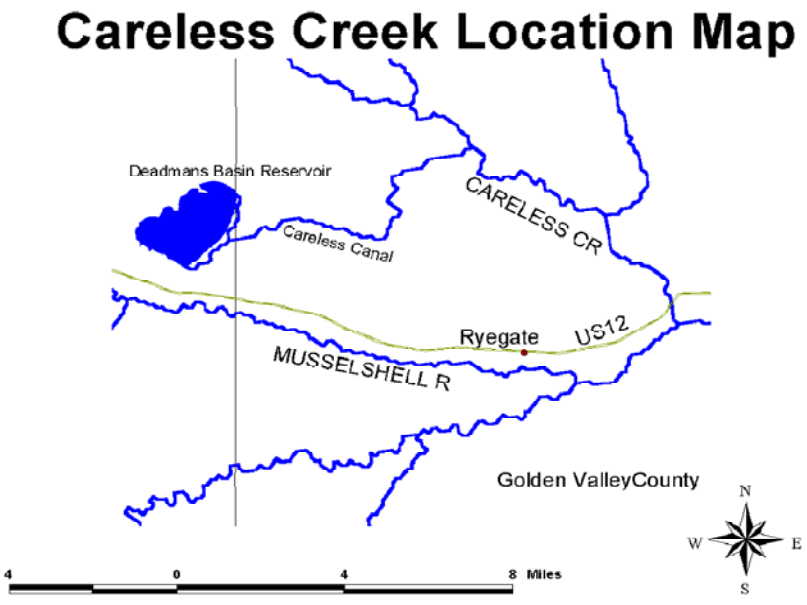
- Development of TMDL to Reduce NonPoint Source Sediment Pollution in Careless Creek, Montana (Sellers, 2000)
- Developments on Careless Creek to Reduce NonPoint Source Sediment Erosion on Careless Creek, Montana (Sellers, 2000)
- Careless Creek Assessment Record (Montana DEQ, various years)
- Water Quality data queried from STORET database (data available for 1973-74, 1976-80, 1994, 2002-2003, 2007)
- Major ions and field parameters collected at mouth of Careless Creek as part of study along Musselshell (Montana DEQ, 2002)
- Re-created cross-section surveys of Careless Creek (Montana DEQ and Montana NRCS, 2003)

These investigations state that the lower portion of Careless Creek (from Deadman's to mouth) has been unstable as a result of irrigation flows and storm runoff. Banks have sloughed and the channel has incised which resulted in deteriorating water quality, impacting both the fishery and aquatic life. Sediment and salinity are specific concerns within this watershed. Infrastructure changes which significantly reduced flows down Careless Creek, restoration work, and on-farm changes are believed to have made a significant change in water quality within Careless Creek.

Location of Pollutants:

The lower 15.5 miles of Careless Creek from the confluence with Careless Canal to the mouth of Careless Creek at the Musselshell River is the major source of pollutants within the creek. Contributing flows from Careless Canal result in bank erosion throughout this stretch. Additionally, a recent survey completed by NRCS found that a reconnected stretch of stream is actively downcutting and contributing to the sediment load. The survey also noted car bodies within the stream.

Site Location Maps:



2.0 OBJECTIVES AND DESIGN OF THE INVESTIGATION

Objectives: The intent of this project is to create an updated comprehensive monitoring protocol that will provide guidance for water quality monitoring for the next four years within Careless Creek. Past monitoring data, previous SAPs, data gathered from a scoping trip, DEQ recommendations, and watershed stakeholder input have all been incorporated into this monitoring plan. This SAP defines what should be monitored, who should monitor, and when and how monitoring should occur. Water quality data is needed to address current conditions within Careless Creek.

Study Design: Nutrients (nitrogen and phosphorus), alkalinity, sediment, total dissolved solids, and periphyton will be sampled as part of this sampling plan. All parameters will be sampled within Careless Creek at four sites (CCPreoutlet, CCZaire, CCatHwy238, and CCHwy12W). Sediment will be sampled at these four sites and at an additional two sites (Careless Canal at headgate and Careless Creek at Sterling Rd.). Grab samples for nutrients and alkalinity will be collected three times a year during the growing season. Samples will be collected in July, August, and September, with at least 28 days separating sampling events. Depending on the weather and the recommendation of the DEQ monitoring supervisor sampling events may begin earlier than July. Periphyton will be sampled twice a year during the first full sampling event (which will include nutrients, alkalinity, and sediment) and during the last full sampling event. Total suspended sediment and total dissolved solids will be collected at all sites (6 sites listed below) once a month from April through October to understand sediment patterns during irrigation and non-irrigation time periods. Additionally trutracks will be installed at all monitoring sites for continuous flow monitoring. Trutracks will be programmed to record a water level measurement every 30 minutes. Instantaneous flow measurements will be made at the time of water chemistry and sediment sampling so that rating curves can be established for the trutracks. This study design will need to be evaluated each year following a review of data collected from the previous season.

Sampling Station Locations: 1. Careless Creek Canal at the headgate out of Barber Canal (downstream of Deadman's Basin Reservoir); 2. Careless Creek above the confluence with Careless Canal (DEQ site ID - CCPreoutlet); 3. Careless Creek at the Zaire property, below the confluence with Careless Canal (DEQ site ID - CCZaire); 4. Careless Creek at HWY 238 bridge; 5. Careless Creek at Sterling Rd; 6. Careless Creek at the Highway 12 road crossing, just upstream of the confluence with the Musselshell (DEQ site ID - CCHwy12W).

- **Rationale for station selection:** Sampling sites were selected after a scoping trip to Careless Creek with DEQ and LMCD personnel. Sites selected either have sampling history pre- and post TMDL development or were identified during the scoping trip as locations helpful to defining water quality conditions within Careless Creek. If water quality data collected does not meet the targets and goals within the TMDL or generally accepted thresholds within the scientific community, the location of these sampling sites should tell concerned stakeholders why and where.

- **Site map:**

- **Proposed Reference sites:** Careless Canal at headgate and CCPreoutlet can be considered reference sites in this project. The Careless Canal at headgate sampling site defines water quality and quantity of water being released from Deadman's Reservoir. Sediment and flow calculations will be made at this site. The CCPreoutlet site defines water quality conditions of Careless Creek upstream of the discharge of Careless Canal into Careless Creek.

- **Table showing water depth/flow at proposed station – n/a**

3.0 FIELD SAMPLING METHODS

Sampling Methods: Water chemistry samples will be collected via grab samples. Grab samples will be collected by MSU Extension Water Quality (MSUEWQ) personnel or by certified volunteer monitors with the Lower Musselshell Conservation District (LMCD). Water chemistry samples for laboratory analysis will be collected according to the grab sample collection procedures in the DEQ Field Procedures Manual, Section VII (FPM WQPBWQM-020). Depth and width integrated samples will be collected where appropriate. Field measurements (water temp, dissolved oxygen, pH, specific conductivity) will be taken at each sampling site by either MSUEWQ or certified volunteer monitors with the LMCD with a YSI multimeter. Periphyton samples will be collected according to procedures described in section VIII B of the DEQ Field Procedures Manual. Staff from the MT DEQ monitoring section will supervise the periphyton sampling during the first monitoring event in 2009. Flow will be measured continuously using trutracks, which will be set to record a water level measurement every 30 minutes. Additionally, instantaneous flow measurements will be made at the time of water chemistry sampling so that rating curves can be established for the trutracks. Instantaneous flow measurements will be made by using a velocity meter and depth rod. DEQ SOPs for flow measurements will be followed as defined in section XII of the DEQ Field Procedure manual. Digital photos will be taken at each sampling site during sampling visits. A photo log will be kept along with the Site Visit Forms (Attachment 1).

Sampling Equipment: Energy Laboratories, who will be responsible for water chemistry laboratory sample analyses, will be responsible for supplying appropriate sample bottles and reagents before each sampling visit. Rhithron Associates, the laboratory analyzing biological samples, will be responsible for supplying appropriate bottles for periphyton sampling. Field instruments needed, which include the YSI meter and portable flowmeter and rod, will initially be kept during the field season by MSUEWQ. Once sampling responsibilities are transferred to the LMCD, the LMCD will keep field instruments during the sampling season. Field instruments will be housed at LMCD during the winter (between final fall event and following year first spring sampling event).

Sample Collection Representativeness: Sample collection will follow procedures described in this section.

Sample Containers, Decontamination Procedures: Energy Laboratories and Rhithron Associates will provide cleaned sample bottles, preservatives, and shipping containers. Both companies are responsible for the disposal of samples sent to their laboratory. Labs will be notified to ship these bottles either to MSUEWQ or LMCD, depending on who is in charge of sampling that particular event.

Field Documentation and Sample Labeling Procedures: Sample bottles will be labeled at time of collection. Site visit forms will be filled out immediately after sample collection. Site descriptions and latitude and longitude coordinates for each site will be recorded in field notes recorded on DEQ site visit forms (Attachment 1).

Procedures for Disposal of Contaminated Sediments: n/a

4.0 SAMPLE HANDLING PROCEDURES

Table 1. Sample Storage Requirements:

Parameter	Preservation	Hold Time
Nitrogen, Ammonia	H2SO4 to pH <2, cool, 4°C	28 days
Nitrogen, Nitrate + Nitrite	H2SO4 to pH <2, cool, 4°C	28 days
Nitrogen, Total Persulfate	Cool, 4°C	28 days
Phosphorus, Total	H2SO4 to pH <2, cool, 4°C	28 days
Solids, Total Dissolved	Cool, 4°C	7 days
Solids, Total Suspended	Cool, 4°C	7 days
Periphyton	Formalin solution, cool	NA

Chain of Custody Procedures: Chain of custody procedures will be followed as described in Section 14.0 (Sample Handling and Custody Requirements) of the MT DEQ's Non-Point Source Water Quality and Standard Operating Procedures. Energy Labs supplies chain-of-custody forms for samples slated for analysis at their lab. Rhithron will provide chain of custody forms for periphyton samples. These forms provide documentation of the sample's integrity prior to receipt at the laboratory and communicate sample information such as owner, location, sampling time/date, and tests to be performed.

Delivery of Samples to Analytical Laboratory: Immediately after collection, samples will be placed in iced coolers. Samples will be refrigerated overnight and shipped the next day to Energy Laboratories in Helena. Periphyton samples will also be refrigerated overnight and shipped the following day to Rhithron Associates in Missoula.

5.0 LABORATORY ANALYTICAL METHODS

Chemical Analyses, Methods, and Target Detection Limits:

Table 2. Chemistry Sample Specifications

Parameter	Method	Target Detection Limit
Solids, Total Dissolved	A2540 C	10 mg/L
Solids, Total Suspended	A2540 D	1 mg/L
Alkalinity	A2320 B	1 mg/L
Nitrogen, Total Persulfate	A4500 N-C	0.1 mg/L
Nitrogen, Ammonia	E350.1	0.05 mg/L
Nitrogen, Nitrate + Nitrite	E353.2	0.01 mg/L
Phosphorus, Total	E365.1	0.005 mg/L

Biological Analyses: Periphyton will be analyzed by Rhithron Associates. Analysis methods are described following: The taxonomist selects a sample and the appropriate paperwork. Each periphyton sample jar is thoroughly mixed to dislodge epiphytes from filamentous algae and to randomly mix the periphyton sample. A biohomogenizer may be used to aid this process, especially when filamentous green algae such as *Cladophora* are abundant in the sample. After homogenization, each sample is partitioned, as required, into portions. Typically there is a portion for soft-body algae analysis and QA/QC procedures, one for diatom analysis, and one for archiving. If needed, samples may be centrifuged before processing in order to reduce sample volume. Permanent diatom slides are prepared: subsamples of approximately 10-20 mL are taken and treated with concentrated H_2SO_4 and 30% H_2O_2. Samples are neutralized by rinses with distilled water, and subsample volumes are adjusted to obtain adequate densities. Small amounts of each sample are dried onto 22-mm square coverslips. Coverslips are mounted on slides using Naphrax diatom mount. To ensure a high quality mount for identification and to make replicates available for archives, 3 slide mounts are made from each sample. One of the replicates is selected from each sample batch for identification. A diamond scribe mark is made to define a transect line on the cover slip, and a minimum of 800 diatom valves are identified along the transect mark. A Leica DM 2500 compound microscope, Nomarski contrast, and 1000x magnification are used for identifications. Diatoms are identified to the lowest possible taxonomic level, generally species, following standard taxonomic references.

For soft-body algae (live non-diatom algae) samples, the raw periphyton sample is manually homogenized and emptied into a porcelain evaporating dish. A small, random sub-sample of algal material is pipetted onto a standard glass microscope slide using a disposable dropper or soda straw. Visible (macroscopic) algae are also sub-sampled, in proportion to their estimated importance relative to the total volume of algal material in the sample, and added to the liquid fraction on the slide. The wet mount is then covered with a 22X30 mm cover slip. Soft-bodied (non-diatom) algae are identified to genus using an Olympus BHT compound microscope under 200X and 400X. The relative abundance of each algal genus (and of all diatom genera collectively) is estimated for comparative purposes, according to the following system:

- rare (r): represented by a single occurrence in the sub-sample
- occasional (o): multiple occurrences, but infrequently seen
- common (c): multiple occurrences, regularly seen
- frequent (f): present in nearly every field of view
- abundant (a): multiple occurrences in every field of view, but well within limits of enumeration
- dominant (d): multiple occurrences in every field of view, but generally beyond practical limits of enumeration

Soft-bodied genera (and the diatom component) are also ranked according to their estimated contribution to the total algal biovolume present in the sample.

Corrective Actions: By reporting results and citing an analytical procedure the laboratory is certififying that the sample was analyzed within the specification and control criteria of the referenced method. In the event of lab evidence of error, repeat sampling will be undertaken when appropriate, and a flag or qualifier will be applied to all data not meeting acceptance criteria to warn users of quality issues.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

QA/QC for Chemical Analyses: Energy Lab has a comprehensive quality assurance program that follows criteria established by the USEPA, NELAC, A2LA, and various state agencies. Energy Laboratories is certified under the Safe Drinking Water Act. Samples are tracked and monitored by a laboratory management system (LIMS) from receipt to report. Samples are logged in upon receipt and immediately inspected to determine any special handling requirements. All analytical procedures, sample handling, and preservation techniques are USEPA approved (where applicable). QA/QC test samples include matrix spikes and duplicates and comprise greater than 10% of the laboratory's analytical load. Energy Lab duplicates every tenth sample to measure and control the precision of their work. Where applicable, Energy lab also spikes every tenth sample to test their accuracy. Additionally, reference samples from the EPA or from private sources are tested by the laboratory with every set of samples to provide a third measure of the performance of their equipment and personnel.

Field QA/QC of water chemistry samples will be achieved by taking one QC set (blanks and duplicates) at one sampling site per sampling event. The QC set will be rotated each sampling event to a different sampling site.

QA/QC for Biological Analyses: Aspects of periphyton identification and enumeration by Rhithron's taxonomy staff that are important to subsequent data quality include the following: 1. The accuracy and precision of identifications and enumerations is maintained such that Bray-Curtis similarity between quality checked samples is 70% or greater. This percent similarity is recommended by Dr. Loren Bahls; 2. Bias is minimized, and data completeness is assured; 3. The client-specified protocol, including the required taxonomic resolution, is faithfully followed;

4. All client-requested deliverables are provided, including reference collections; 5. A summary of QA/QC procedures and results, and sample processing procedures is documented and delivered along with client-requested deliverables.

Data Quality Assurance Review Procedures: Water chemistry data generated from this sampling project will be reviewed to 1. determine that the methods listed for analysis within this report are the same as cited on the report received from the laboratory, 2. laboratory sample duplicates meet method performance criteria (Table 3), and 3. laboratory control samples for each method as reported in analytical reports meet method performance criteria (Table 3).

Table 3. Method Performance Criteria

Parameter	Method	Method Blanks	Lab Duplicates (RPD)	Field Duplicates (RPD)	Lab Control (LCS/LFB)	MS/MSD
Solids, Total Dissolved	A2540 C	<10 mg/L	20%	25%	90% - 110%	80% - 120%
Solids, Total Suspended	A2540 D	<1 mg/L	10%	25%	75% - 120%	NA
Alkalinity	A2320 B	<4 mg/L	20%	25%	90% - 110%	80% - 120%
Nitrogen, Total Persulfate	A4500 N-C	<0.1 mg/L	10%	25%	90% - 110%	90% - 110%
Nitrogen, Ammonia	E350.1	<0.05 mg/L	10%	25%	90% - 110%	90% - 110%
Nitrogen, Nitrate + Nitrite	E353.2	<0.01 mg/L	10%	25%	90% - 110%	90% - 110%
Phosphorus, Total	E365.1	<0.005 mg/L	10%	25%	90% - 110%	90% - 110%

LCS and LFB = Laboratory Control Sample and Laboratory Fortified Blank, respectively
MS and MSD = Matrix Spike and Matrix Spike Duplicate, respectively

Periphyton data accuracy is insured by several QA/QC steps at Rhithron, beginning with the benchsheet review that takes place immediately after a taxonomist completes the identification and enumeration of a sample. A second taxonomist reviews the benchsheet for completeness and confers with the initial taxonomist when deficiencies are noted. A secondary QA/QC check of all data is performed by the Lead Taxonomist and the Data Technician, who review the completed data for an entire project. Deficiencies in completeness are noted, and taxonomists make changes as needed. Accuracy of data entry is checked by rekeying data from 10% of samples by a second person, an experienced data entry technician. The two resulting data files are checked by running a Bray-Curtis similarity calculation. When the similarity is less than 100%, the data entry quality check is regarded as a failure, and another 10% of samples

are rekeyed into the database application. Final data versions are reviewed by the Operations Officer before data deliverables are sent to clients. Before sending the report, the compliance document checklist is reviewed to make sure that all deliverables are completed to the specifications of the client's scope of work. A technical summary of QA/QC statistics for each sample and the protocols employed in sample processing and identification is prepared by the Data Technician and reviewed by the Operations Officer, Chief Biologist and Lead Taxonomist, and is sent to the client along with data deliverables. Final decisions about alterations to sample processing or identification protocols are made by the client. Any circumstances or problems that may compromise the validity or usefulness of the data are reported to the client by the Chief Biologist.

7.0 DATA ANALYSIS, RECORD KEEPING, AND REPORTING REQUIREMENTS

Data Interpretation: Data collected will be routinely reviewed and summarized, ongoing throughout this project. A year end summary interpretation report will be prepared by Rhithron Associates for periphyton samples. Interpretations for water chemistry data will be completed by MSUEWQ staff. Data interpretations will be used to assess current water quality conditions and to make comparisons with historic data when appropriate.

Record Keeping Procedures: Field personnel will record field measurements and chemistry sample collections on DEQ site visit forms included within this SAP and/or an all-weather (Rite in the Rain) notebook. Field measurements recorded on all-weather notebooks will be transferred to field sheets when weather dictates the necessity. Additionally samplers will be responsible for completing laboratory chain of custody forms. Project samplers will manage all field forms and field books.

Reporting Procedures: Copies of field forms and field notes will be forwarded to MSUEWQ staff when LMCD volunteers complete monitoring. Additionally laboratory results will be forwarded from the LMCD office to MSUEWQ staff. MSUEWQ will enter data into spreadsheets and keep hardcopies of all forms and notes. It will be requested that Energy laboratories provide data electronically in a STORET compatible format. MSUEWQ will be responsible for overseeing that electronic data deliverables are loaded into the EPA's STORET database through the WebSIM application at the conclusion of each year's sampling events. STORET guidelines can be found at: http://www.deq.mt.gov/wqinfo/datamgmt/STORET_SIM_Support.asp. Annual reports of sampling results will be completed by MSUEWQ and distributed to the appropriate parties.

8.0 SCHEDULE

The project schedule was presented in Section 2.0 under study design. Additional project milestones are listed below:
April 2009 – May 2010 – Volunteer Training
April 2009-2012 – October 2009-2012 – Collect samples and interpret data
January/February 2010 – 2013 – Annual summary reports will be completed for the previous season's sampling efforts. Meetings will be held with LMCD to review results and discuss sampling needed the following year.

9.0 PROJECT TEAM AND RESPONSIBILITIES

Sampling Personnel: Kim Hershberger, with MSUEWQ, will initiate the sampling program and will be the primary sampler during 2009. As volunteers of the LMCD are trained and certified, they will begin to take over sampling responsibilities. MSUEWQ will provide guidance throughout the project and will be available to help with two sampling events a year from 2010 – 2012.

Project Team Responsibilities: MSUEWQ will initiate the sampling program and will train up to four volunteer monitors to complete water quality monitoring using protocols outlined in this SAP. After volunteers are trained and certified they will perform the majority of sampling/monitoring duties and enter data into the STORET database. Data analysis and data reporting will be the responsibility of MSUEWQ. MSUEWQ will provide oversight and evaluation for the duration of the project which includes the preparation and updates of the SAP (if necessary), data quality assurance review, and field reviews to ascertain that sample collection remains consistent throughout the duration of this project.

10.0 REFERENCES

Montana Department of Environment Quality. February 2001. Careless Creek Water Quality Restoration plan, Helena, MT. Available:
http://www.deq.mt.gov/wqinfo/TMDL/pdf/Careless_Creek_FINAL.pdf

Montana Department of Environmental Quality. 2005. Field Procedures Manual for Water Quality Assessment Monitoring, Helena, MT. Available:
http://www.deq.state.mt.us/wqinfo/QAProgram/SOP%20WQPBWQM-020.pdf

Attachment 1 - Site Visit and Photo Log forms

Place Site Visit Label Here

Site Visit Form

(One Station per page)

STORET Project ID:_____

STORET Trip ID :_____

Date: _____ Time: _____ Personnel: _____

Waterbody: _____ Location: _____

Station ID: _____ Visit #: _____ HUC: _____ County: _____

Latitude: __ __ . __ __ __ __ Longitude: __ __ __ . __ __ __ __ Lat/Long Verified? ☐ By:

Elevation (m): _____ GPS Datum: NAD27 **NAD83** WGS84

Samples Collected:	**Sample ID** (Provide for **all** samples)**:**	**Sample Collection Information/Preservation:**
Water ☐		GRAB
Analysis:		Preservative: HNO_3 H_2SO_4 HCL None
Analysis:		Preservative: HNO_3 H_2SO_4 HCL None
Analysis:		Preservative: HNO_3 H_2SO_4 HCL None
Analysis:		Preservative: HNO_3 H_2SO_4 HCL None
Analysis:		Preservative: HNO_3 H_2SO_4 HCL None
Sediment ☐		SED-1
Analysis:		Preservative: None Other:
Analysis:		Preservative: None Other:
Chlorophyll a ☐		C=Core H=Hoop T=Template N= No Sample
Transect:	1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____ 11____	
Phytoplankton ☐		PHYTOPLANK Volume Filtered (mL):
Algae ☐		PERI-1 OTHER:
Macroinvert. ☐		KICK HESS JAB OTHER:
Kick/Jab Length (ft):	Kick Duration/# Jabs: # of Jars:	Mesh Size: 1200 1000 500 OTHER:

Field Measurements:		**Field Assessments:**
Temp:	W °C °F A °C °F	Macroinvertebrate Assessment ☐
pH:		Habitat Assessment: Reach Scale ☐ Site Scale ☐
SC: (umho/cm)		EMAP Assessment ☐
DO: (mg/L)		Substrate: Pebble Count ☐ Percent Fines ☐ RSI ☐
Turbidity: Clear ☐ Slight ☐ Turbid ☐ Opaque ☐		Channel Cross-Section ☐
Flow: (cfs)		Photographs: Digital ☐ Film ☐
Flow Method: Meter ☐ Float ☐ Gage ☐ Visual Est. ☐		Other Assessments:
Flow Comments: Dry Bed ☐ No Measurable Flow ☐		
Site Visit Comments:		

Chemistry Lab Information:		
Lab Samples Submitted to:	Account #:	Date Submitted:
Invoice Address:		
Contact Name & Phone:		
EDD ☒ Format: SIM Compatible	Term Contract Number:	
Relinquished By & Date/Time:	Shipped By & Date/Time:	Received By & Date/Time:
Relinquished By & Date/Time:	Shipped By & Date/Time:	Received By & Date/Time:
Relinquished By & Date/Time:	Shipped By & Date/Time:	Received By & Date/Time:

Lab Use Only - Delivery Temperature (°C): _____

Site Visit Form Instructions

1. Place a Site Visit Code label in the upper left corner.
2. Place a Trip Label in the upper right corner. (Covering Project ID and Trip ID with label is alright.)
3. **STORET Project ID:** If you do not have a Trip Label, enter the Project ID assigned by Data Management. If you do not know the Project ID contact the STORET Database Manager.
4. **Trip ID:** If you do not have a Trip Label, enter the Trip ID assigned by Data Management. If you do not know the Trip ID contact the STORET Database Manager.
5. **Date/Time:** Enter the date and time of the station visit.
6. **Personnel:** Enter the first and last name(s) of the personnel conducting field activities.
7. **Waterbody:** Enter the name of the waterbody such as "Missouri River".
8. **Location:** Description of sample location such as "upstream from bridge on Forest Service road 100". For confidentiality please DO NOT use proper names of people in the location field.
9. **Station ID:** If you have a Trip Label, enter the established ID or assign a new ID by using the station prefix found on the Trip Label. If you do not have a Trip Label and do not have a Station ID, leave the field blank and Data Management will generate a Station ID when SVF is submitted.
10. **Visit #:** Enter "1" if this is a new station. Leave blank if visit number is unknown.
11. **HUC:** If you do not have a Trip Label, enter the fourth code (8 digit) HUC the station falls within.
12. **County:** If you do not have a Trip Label, enter the county in which the station falls within.
13. **Lat/Long:** Latitude and Longitudes should be obtained in decimal degrees using a GPS unit reading NAD83 whenever possible. If a lat/long is obtained by another method, the datum and method must be recorded in the Site Visit Comments.
14. **Lat/Long Verified:** Latitudes and Longitudes should be verified immediately upon return from the field. Verify by plotting on a paper map or using a mapping website. Once the lat/long has been verified check the Verified box and enter initials after "By".

- Do not make minor adjustments to measured values during verification; they are assumed to be correct within the limitations of the measurement system.
- Gross errors should be corrected as follows: 1) Draw a single line through the erroneous value(s) and initial. Do not erase the original reading. 2) Write the corrected value in the comment field along with the method and datum used to derive the corrected value.

15. **Elevation:** Record elevation collected by GPS and circle the GPS datum used. If elevation is obtained by another method, the datum and method must be recorded in the Site Visit Comments.
16. **Samples Collected:** Check the box next to each activity that is collected during the station visit.
17. **Sample ID:** Write the Sample ID (Site Visit Code-sample identifier) for all of the samples collected.
18. **Sample Collection Procedure:** Circle the appropriate Sample Collection Procedure ID.

- For Chlorophyll a, record the sample collection ID for each transect in the spaces provided.

19. **Analysis Requested:** Record the requested laboratory analysis for each chemistry sample and circle the preservative used.
20. **Field Measurements:** Record your field measurements in the spaces provided.
21. **Field Assessments:** Check the boxes next to each type of field assessment completed.
22. **Site Visit Comments:** Record general comments about the station visit, samples, and field measurements.
23. **Chemistry Lab Information:** If chemistry lab samples were taken, complete this section.

- Lab Samples Submitted to: Enter name of laboratory where samples will be sent.
- Account #: Enter account number at laboratory where samples will be sent.
- Date Submitted: Record date the samples were received by the laboratory.
- Sign and date the form each time the samples change possession.

PHOTOGRAPH LOCATIONS AND DESCRIPTIONS OF REACH AND/OR SITES

Date: **Site Visit Code(s):**

Waterbody: **STORET Station ID:**

Personnel:

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description:

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____

Photograph Locations and Descriptions - Continued

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____

Photo No: _____ Lat _____ Long _____

Description: _____