



The State
of Wyoming



Department of Environmental Quality

Dave Freudenthal, Governor

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E-Mail followed by U.S. Mail

March 22, 2004

Mr. Tom Hardgrove,
Pathfinder Mines Corp,
P.O. Box 730
Mills, WY 82644

Re: Spring Creek Stream Assessment, Draft Work Plan for Biotic Survey
Shirley Basin Site, Wyoming
NRC Docket No. 40-6622, License No. SUA-442 (TAC No. L51931)

Dear Mr. Hardgrove:

The Water Quality Division (WQD) has reviewed the new Spring Creek Stream Assessment work plan for a biotic survey dated April 26, 2004. We received a faxed copy of this work plan on April 26, 2004 from you. We only have a few minor comments on this work plan as follows below.

We are pleased to see that you will be following the standard operating procedures (SOPs) that the WQD Watershed Program has developed. For quantifying substrate size the work plan states that they will indicate silt, gravel, sand and rock. We suggest *two* gravel sizes be distinguished. The breakdown for fine gravel is 0.3 inches to 1 inch, and coarse gravel is 1 inch to 2.5 inches. Cobbles are the next in size, from 2.5 inches to 10 inches, but these might not exist in the riffle environment for these streams. The Watershed Program also describe the degree to which the substrate is covered with silt. if the silt is greater than 1/4 inch thick, we then consider the silt as a form of substrate, not just a covering. It is critical that a uniform area (in square feet) is used to quantify the substrate area at all sites so that there is some comparability.

The work plan describes a problem with obtaining eight (8) surber samples from the riffles on the target creeks. The plan instead proposes using only four (4) samples at each site. The challenge in finding riffles of sufficient length is common for this ecoregion. We strongly encourage

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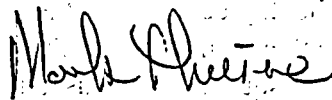
observing the riffle length of all riffles prior to sampling so that you could determine the number of Surber frames you can use to ensure comparability for all sites. We also advise that if the riffle is contiguous to a run (fast moving water) environment, then that run can also be sampled. On a short riffle, we will often sample the riffle, and up into the zone where the riffle transitions into the upstream slow-moving glide. Eight frames has been considered optimal for DEQ purposes, for capturing the representative benthic community, therefore we want Pathfinder to try extremely hard to obtain the eight samples. This means a riffle of 8 feet in length is as short as we can realistically go, and this means the random number list (as described in the SOPs) is not used. We simply place the frame every foot up the riffle, without any overlap. Some riffles are short, but have a sufficient *width* such that 8 square feet can be sampled. This also functions in capturing the benthic community. The random number list is utilized to demonstrate that the sampler is not targeting a particular part of the riffle, however, on a short riffle the sampler is forced to use what is available. If this is not possible at a given site to obtain the eight samples, try and use 6 frames, however, these sites could not be quantitatively compared against the sites where 8 frames were used. And locations where only 6 frames are obtained would not be comparable to the WQD database that we will use to evaluate the results. If riffles appear to be highly different from one another, documentation as to the riffle condition (size, width, photos, etc) will be especially important.

The work plan asks for our approval in selecting a lab for the biotic identification. Because of State regulations, we can not recommend a specific lab for any sort of analysis. However, attached is a copy of the document we use for scoring labs in a request for bids. Obviously, not all of this information will pertain to your needs, but the document gives you an idea of what we find important and what we look for in an acceptable lab.

Also, a taxa list has been provided in an Exel file (via email only). This list documents the distinct taxa that have been collected by the DEQ in our monitoring history. It is not a complete list of all taxa found in the state, and the list does grow through time. We cannot mandate what taxa list to follow (as there are taxonomic differences, spelling differences, etc) however we encourage the use of the provided list. By using this list, the work done as part of this assessment can be compared against the sizeable dataset that has been collected around the state. The field labeled 'FinalID' is the taxonomic level the bugs are identified to.

Please contact me or Tavis Eddy with the Watershed Program at the above address or at 307-332-3144 if you have any questions about our comments.

Sincerely,



Mark Thiesse
GPC West District Supervisor
Water Quality Division

attach: Bid Request letter

cc: Mr. Gary Janosko, Branch Chief, U.S. Nuclear Regulatory Commission,
Document Control Desk, Mailstop T8 A33, 11545 Rockville Pike, Rockville, MD
20852-2738 (w/attach)
Mr. Kevin Frederick, WQD, Cheyenne (w/o attach)
Mr. Tavis Eddy, WQD, Lander (w/o attach)

**Wyoming Department of Environmental Quality
Macroinvertebrate Sample Analysis and Data Management**

Request for Bids

Introduction

The Wyoming Department of Environmental Quality (WDEQ) is requesting bids for macroinvertebrate sample analysis and data handling. This work will be done as part of WDEQ's statewide watershed monitoring effort. The term of contract will extend from January 1, 2004 through June 30, 2006, pending an annual review by WDEQ and mutual agreement by both parties.

Each individual sample will be a composite of eight Surber (500 micron) samples collected from stream riffles or runs. Samples will be preserved in 70-80% isopropynol solution and contained in a single or combination of 500 ml or 1000 ml Nalgene bottle(s). Sample bottles will be provided by WDEQ. Approximately 400-450 samples will be submitted to the contractor during the term of this contract.

An individual macroinvertebrate sample processed by a qualified, experienced taxonomist using the described standardized method will generally take between five hours (for mountain streams) and ten hours (for plains streams). The ratio of plains to mountain stream samples will be approximately 3:1.

Level of Identification

A standardized level of identification is required to allow for valid comparison of macroinvertebrate data sets between sampling locations. The minimum level of identification set by WDEQ requires that the majority of organisms be identified to genus with some groups identified to species or species group. Specific levels of identification required by WDEQ are as follows:

Ephemeroptera: Genus for all families, except

- 1) Baetidae (species for mature nymphs of the genus *Baetis*)
- 2) Ephemerellidae (species for *Drunella* and *Timpanoga*)

Plecoptera: Genus for all families, except

- 1) Nemouridae (species or species group for *Zapada*)
- 2) Perlidae (species, except genus for *Doroneuria*)
- 3) Capniidae, Leuctridae, and Chloroperlidae (family, except genus for *Kathroperla* and *Sweltsa*)

Trichoptera: Genus for all families, except

- 1) Rhyacophilidae (species or species group)

Coleoptera: Family or genus (be consistent), except

1) genus for Elmidae

*combine larvae and adults as single taxon

Megaloptera, Neuroptera, Lepidoptera, and Hemiptera: Genus for all families, except

1) Corixidae (family)

Chironomidae: Genus, except

1) Cricotopus, Cricotopus nostococladus, and Orthocladus (subgenus or species group)

*identify pupae collectively as "Chironomidae pupae"

Other Diptera: Family, except

1) Simuliidae, Empididae, Tipulidae, Athericidae, Psychodidae, and Dixidae (genus)

* identify pupae collectively as "Diptera pupae"

Odonata, Decapoda, Mollusca: Family

Oligochaeta: Genus or species; Immatures grouped to family; Identify immature tubificids as being with or without dorsal capilliform (hair) setae.

Isopoda, Amphipoda, Coelenterata: Genus

Porifera, Turbellaria, Nematoda, Hirudinea, Acari: Phyla or Class

Zooplankton (Cladocera, Copepoda, bdelloid and other rotifers), Ostracoda, terrestrial invertebrates, fish (larval, juvenile, adult), and amphibians should be noted but not included in metric calculations.

Sample Processing and Subsampling

Upon receipt by the laboratory, samples will be checked for proper preservation, catalogued, and the chain of custody form will be signed.

If subsampling is required, the numbered grid system of Plafkin and others (1989) as modified by Caton (1991) will be used. Organisms will be hand-picked from randomly selected squares in the gridded tray until at least 500 organisms are removed or the entire sample has been processed. When organism density is high (greater than 250 organisms per square), the second and third squares or subsamples will be divided into quarters by placing an x-shaped frame over each square. One of the quarters in each square or subsample will be randomly selected and all organisms removed. This step is repeated until at least 500 organisms have been removed and at least three randomly selected squares have been sampled. After the subsampling has been completed, the sorter will re-distribute the organisms within the gridded tray and spend about five minutes looking for large and rare organisms. Organisms removed during the large and rare search will be placed in a separate vial and assigned an occurrence of one (1) for the correction factor, density, and metric calculations. Subsampling will be documented on the Subsampling Form (provided by WDEQ).

Unsorted sample fractions will be re-preserved in 70-80% isopropynol solution (or another pre-approved solution) and stored by the contract laboratory. Contractors may need to store sample fractions for as long as six months. WDEQ will request that a subset of the samples be returned for quality assurance purposes. Sample fractions not selected will be appropriately discarded by the contractor.

A reference collection of identified organisms will be established and submitted to the WDEQ, Sheridan, Wyoming office. This collection will be used for taxonomic QC purposes.

Data Handling - Macroinvertebrate Metrics

The contract laboratory will analyze the taxonomy matrix for each sample and summarize with a suite of macroinvertebrate metrics. Required metrics are given below:

1. Total invertebrate abundance
2. EPT abundance
3. Total taxa richness
4. EPT taxa richness
5. Taxa richness, abundance, and percent composition of all insect orders, non-insects (composited), and Chironomidae.
6. Taxa richness, abundance, and percent composition of all functional feeding groups
7. Abundance and percent composition for each of the 10 most abundant taxa.
8. Hilsenhoff Biotic Index
9. Biotic Condition Index CTQp (Winget and Mangum, 1979)
10. Diversity measures (Shannon H, Simpson D, Brillouin H) and Evenness
11. Abundance and percent composition of multi-, uni-, and semi-voltine organisms
12. Ratios of taxonomic group abundances (EPT/Chironomidae, Hydropsychidae/total Trichoptera, Baetidae/total Ephemeroptera)
13. Ratios of functional feeding group abundances (scraper/collector-filterer, scraper/(scraper+c-filterer))

* to avoid redundancy in taxa richness calculations, organisms not identifiable to the required taxonomic level (i.e. damaged or immature organisms) should be listed at the most refined level attainable, but not counted as separate taxa.

Descriptions of these metrics can be found in Plafkin and others (1989), Bazata (1991), Clark and Maret (1991), Barbour and others (1992), Merritt and Cummins (1996).

A master taxa list for macroinvertebrate taxa expected to be found in Wyoming showing functional feeding group and voltinism designations, and HBI and BCI tolerance values will be provided to the contractor. It is imperative that the provided list be used to ensure that metric values are comparable to those calculated in previous years.

Sample Submittal and Data Turn-Around

Samples will be submitted to the contractor and processed according to the following schedule:

Field Season (year)	Date received by contractor	Deadline for data reporting
2002 and 2003	January 1, 2004	June 30, 2004
2004	no later than January 1, 2005	no later than June 30, 2005
2005	no later than January 1, 2006	no later than June 30, 2006

The processing of samples and reporting of data will be completed within 180 days of the receipt of samples by the contract laboratory. The contractor must be prepared to meet this time line. Data reported to WDEQ will consist of:

1. The original (signed) chain of custody form
2. The original subsample sheet (completed in ink)
3. Preserved and identified reference organisms
4. A complete taxonomic matrix based on the required level of identification (printed and Excel format)
5. Metric calculations (printed and Excel format)

WDEQ will be responsible for the costs of shipping samples and forms to the contract laboratory. Empty Nalgene bottles, unsorted sample fractions, and coolers will be returned to the WDEQ Sheridan, WY office. The contract laboratory will be reimbursed for costs of shipping these materials. The contract laboratory will be responsible for costs of shipping data reports, the reference collection, and completed chain of custody sheets.

Required Qualifications

The contract laboratory taxonomist(s) must meet the following qualifications:

1. Familiar with the aquatic ecology and macroinvertebrate taxonomy of the streams of Wyoming and other western states.
2. Education and/or experience in macroinvertebrate collection and data interpretation.
3. At least three years professional experience in macroinvertebrate taxonomic identification (to the level required in this request).
4. Possession of required taxonomic and metric literature

Bid submittal

Interested parties should provide a detailed statement of qualifications along with a per sample bid based on the requirements outlined in this request. All bids submitted to WDEQ will be recognized as having factored in all of the above-outlined responsibilities. The bid will be awarded based on the following scoring system:

1. Knowledge and Experience (50 pts.)

2. Complete Cost Per Individual Sample (50 pts.)

WDEQ is not responsible for any costs incurred by prospective bidders prior to the signing of a contract.

All bids and statements of qualifications should be submitted to:

Steve Toalson
Wyoming Department of Environmental Quality
Herschler Building, Fourth Floor West
122 W. 25th St.
Cheyenne, WY 82002

Questions on technical issues should be submitted to:

Jeremy R. ZumBerge
Wyoming Dept. of Environmental Quality
1043 Coffeen Ave, Suite D
Sheridan, WY 82801
307-672-6457, jzumbe@state.wy.us

Subcontractors

The use of a subcontractor shall be clearly explained in the bid package. The successful bidder will be responsible for all contract requirements whether or not subcontractors are used.

Literature Cited

Barbour, M.T., J.L. Plafkin, B.P. Bradley, C.G. Graves, and R.W. Wisseman. 1992. Evaluation of EPA's rapid bioassessment benthic metrics: metric redundancy and variability among stream sites. *Environ. Toxicol. And Chem.* 11:437-449.

Bazata, K., 1991. Nebraska stream classification study. Nebraska Dept. of Env. Control, Water Quality Div., Surface Water Section, Lincoln, NE.

Caton, L.W. 1991. Improved subsampling methods for EPA rapid bioassessment benthic protocols. *Bulletin of the North American Benthological Society*, Fall 1991.

Clark, W.H., and T.R. Maret. 1991. Protocols for assessment of biotic integrity in Idaho streams. *Water Quality Monit. Protocols - Rpt No. 5*, Idaho Dept of Health and Welfare, Water Quality Bureau, Boise, ID. 45 p.

Merritt, R.W., and K.W. Cummins. 1996. *An introduction to the aquatic insects of North*

America. 3rd edition, Kendall/Hunt Publishing Company, Dubuque, IA.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for streams and rivers. Office of Water, EPA/444/4-89-001. Washington, D.C.

Winget, R.N. and F.A. Mangum. 1979. Biotic condition index: integrated biological, physical, and chemical stream parameters for management. U.S.D.A. Forest Service, Intermountain Region. Ogden, UT 51 p.