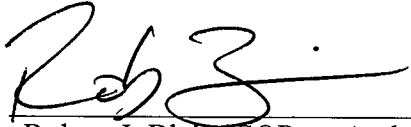


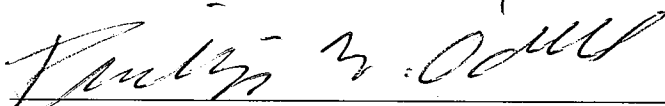
**Watershed Management Branch
Safe Sampling Procedures
Groundwater Section Standard Operating Procedure
GWB 100.3.3**



Robert J. Blair / SOP co-Author/Project Coordinator

6/8/09

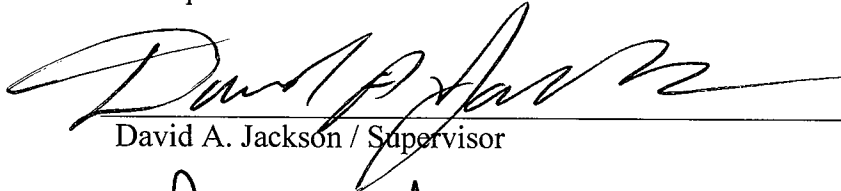
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Phillip W. O'dell / SOP Reviewer

6/15/09

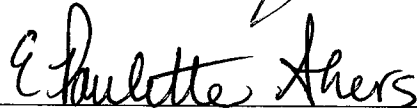
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David A. Jackson / Supervisor

8/19/09

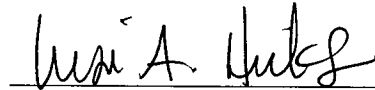
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Paulette Akers / Branch Manager

8/24/09

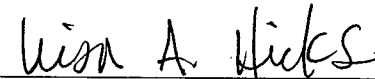
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Lisa Hicks / Watershed Branch Quality Assurance Officer

08/28/09

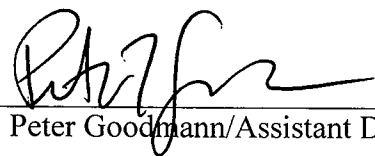
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Lisa Hicks/Division Quality Assurance Officer

08/28/09

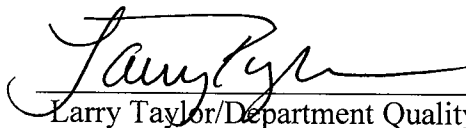
Date



Peter Goodmann/Assistant Director, Division of Water

8/28/2009

Date



Larry Taylor/Department Quality Assurance Manager

9/1/09

Date

WATERSHED MANAGEMENT BRANCH SAFE SAMPLING PROCEDURES

Groundwater Section Standard Operating Procedure GWB 100.3.3

I. Introduction

This Standard Operating Procedure (SOP) establishes the protocol for sampling groundwater to ensure that all groundwater analyses in the Kentucky Department for Environmental Protection's Consolidated Groundwater Database are comparable.

Data in the database may be used for water quality assessments by state government, consultants, city and county governments, and private citizens, and others. Consistent sampling techniques are crucial to making informed decisions based on comparable data.

II. General Safety

The guidelines in this section must be followed to insure the safety of all DOW employees sampling groundwater. Report all accidents to your supervisor, no matter how minor the accident may appear to be.

The groundwater sampler is responsible for making the sampling site as safe as possible. If you are at a site where your safety is in question, leave the site. Assess the site before you start sampling: look for any potential hazards. Use a Site Safety Inspection Form (See **Attachment 1**) to assist in recognizing hazards and what steps should be taken to minimize the hazard

Three acids are used during sampling. Read the MSDs for each of these acids before using them for the first time, and anytime you need a refresher on their properties. MSDs for all chemicals used by samplers are located in a 3-ring binder in the Branch laboratory.

Use the following guidelines and manuals to supplement the information in this SOP:

Field investigators will not be required to participate in any operation that violates OSHA and EPA safety regulations/guidance. All sampling personnel must have completed the Office of Safety and Health Administration (OSHA) 1910.120 HAZWOPER – GENERAL training course before entering any site with potential or known contamination of any sort.

The safety protocols in this SOP are written in accordance with those defined by the following manual: Field Health and Safety Manual: USEPA, Region IV, 1990: Covers safety involved in all field activities performed in Region 4, and includes regional policy regarding training requirements, medical monitoring, and personal protection.

Any accident must be reported in accordance with Cabinet accident reporting requirements. These requirements are available from your Supervisor or from the Division of Administrative Services.

In addition, protocols from the Division of Water Watershed Management Branch; Department For Environmental Protection Chemical Hygiene Plan will be followed for any Branch laboratory Activities. As a Groundwater Section sampler, you should be aware of the following items from the Plan:

1. Personnel responsible for receiving and storing hazardous chemicals from manufacturers and suppliers will ensure that the containers are marked with the following information:
 - a. Identity of the hazardous chemical(s)
 - b. Appropriate hazard warnings
 - c. Name and address of the chemical manufacturer, importer, or other responsible party
2. Labels on containers or hazardous chemicals will not be removed or in any way defaced.
3. The Chemical Hygiene Officer and the Laboratory Manager shall maintain a master listing of Material Safety Data Sheets (MSDS) for all chemicals in the inventory. A copy of this master listing shall be posted in each laboratory facility.

If any violations to these rules are observed, notify your supervisor and the personnel listed in 3 above.

III. Sampling Preparations

A. General

The Groundwater Section uses several forms and sign-out sheets to keep track of equipment. Learn to use these various forms and sheets and know where they are located. The more complicated forms will have SOPs on methods of completion

and use. The type of samples collected, the sample holding times and availability of acceptable labs will dictate the number and types of samples that can be collected in a single trip. Pre-trip planning will maximize efficiency and minimize the need to resample a site.

1. Forms, Checklists, and Sign-Out Sheets

a. Equipment/Supplies Checklist

Use a Groundwater Section Checklist (See **Attachment 2**) to secure the correct sampling supplies and equipment for the sampling run.

c. Equipment Sign-Out Form(s)

Equipment such as peristaltic pumps, field meters, GPS units, cameras, etc. must be accounted for at all times. Therefore, anyone taking equipment to the field must sign for those items they take with them. Small, expensive items are kept in a supply cabinet in the Branch office area. Larger, or less expensive equipment is stored in the Branch storeroom. Equipment sign out sheets are located in each storage area.

2. Other Necessities

a. Trip Blanks

Each time a sample (or set of samples) is collected, a volatile organic compound (VOC) trip blank must accompany the sample(s). These trip blanks are supplied to the Branch by the Environmental Services Branch (ESB) laboratory. Load the VOC trip blanks on the day you sample. These blanks accompany you to each site and are turned in to the ESB lab with the samples taken that day. Generally, each day requires a new trip blank. An exception is when the sampler is out overnight (e.g. does not return to the workplace before starting another round of sampling).

b. Regional Offices Notification

Notify the affected regional office(s) about where you will be working and when. This is mandatory. Often, people see an official vehicle near their home and call the regional office to find out what is going on.

c. Supervisor Notification

Finally, let your supervisor know that you will be in the field sampling.

B. Sampling Equipment

All equipment should be both clean and calibrated, as required, when signed out. If it is not, contact the Equipment and Supply Manager about the problem. All returned equipment will be cleaned of mud, dirt, etc. before being put into its proper place.

1. Equipment required for all sampling:

a. Thermometer

Many analytes have different concentrations depending on the temperature of the water. Meters with internal thermometers do not always agree, so the Branch supplies one with each set of meters. Use this thermometer for reading water temperatures.

b. Meters to measure conductivity and pH.

The Branch employs multi-parameter field meters for temperature, conductivity, and pH of groundwater. Meters are cleaned and calibrated with regular frequency (every 2-3 months). The cleaning and calibration record is kept in a log book stored with each field meter. Refer to the individual meter manual for cleaning and calibration procedures if necessary.

c. Coolers

Coolers are located in the Branch storeroom. Ice may be procured in the DOW Laboratory in Building 150 or purchased in the field. All groundwater samples must be kept at approximately 4°C. Coolers with ice are used for this sample preservation method until the samples are delivered to the laboratory.

d. Maps

Folders are maintained for each monitoring network run which include: completed inspection/inventory forms, site information forms and individual site maps for each site and a base map for each run. Additionally, the Branch has topographic and geologic maps available for field use. Other maps such as the Kentucky Atlas & Gazetteer can be purchased with Branch funds to assist in site location and navigation.

e. Sharpie™ markers

Sharpies are the best all around writing utensil in the field. Secure both a Fine Point and an Ultra Fine Point Sharpie for labeling the containers.

f. Decontamination supplies

Decontamination supplies consisting of de-ionized water and 10% hydrochloric acid (HCl) are used for cleaning any equipment that cannot be discarded upon use such as buckets, ropes, or field meter probes. All supplies are kept in the Branch storeroom.

2. Equipment required for specialized sampling

a. Peristaltic pump

Peristaltic pumps are used for filtering specified samples for analysis. All laboratories use filtered water to extract dissolved metals, while some labs also use filtered water to extract ortho-phosphate. Other parameters may also require filtered water. The project manager/principal investigator should be contacted for more information. ESB lab personnel are also knowledgeable in which parameters require filtering.

b. Teflon bucket(s) and rope

Some sites are not easily accessible at water's edge. Teflon bucket(s), and rope or string, should be used to safely obtain a sample where getting to the stream edge is not feasible. Remember that these items must be decontaminated between each use.

c. RadAlert meter

The RadAlert meter should be used if radioactivity is suspected at the site to be sampled. It may also be used for site investigations when samplers may encounter unforeseen hazards (i.e. uncontrolled dumps, etc). Refer to the product manual for instructions on the use and care of the RadAlert meter. The manual is kept with the meter.

3. Optional Equipment

Optional equipment (may sometimes be required equipment, depending on circumstances) is any equipment that may make the sampling task easier or faster without sacrificing safety.

a. Backpack

Some sites are remote from vehicular access. Backpacks make sample hauling easier and safer by putting the weight on a strong part of the body while leaving hands free.

b. Bailer(s)

Wells without surface access will require some means to purge the well and then collect a sample. Bailers are long tubes with a stopcock at one end that will allow water into that end of the tube, but will close off the opening at the end of the tube when it is full. (Note: bailers require rope or string)

c. Global Positioning System Unit

The GPS unit gives the correct latitude, longitude, and elevation of a location. Any new spring inventory or well inspection done for DOW should be located using a GPS unit. Read the instructions (housed in the same place as the GPS unit) and Latitude and Longitude Collection: GPS Procedures before attempting to use the unit. Pay special attention to any instructions on use limitations. The unit does not require any calibration that can be done in the field. If the unit does not appear to be working properly (or accurately) inform the equipment manager. Instruction manuals are stored in the cabinet with the units.

d. Cameras

i. Digital Cameras

The Branch has two digital cameras available for use. Instructions for each camera are housed in the same place as the cameras.

ii. Down-hole (or well) Cameras

Use only after proper instruction on the camera's use. An SOP for using the camera is in progress. Until it is finished, however, learn from veteran camera users how it's done. Some of the equipment associated with the camera does not work properly at temperatures below 40° Fahrenheit. Reschedule any trips with the camera if the weather makes operation of the equipment below 40° Fahrenheit likely.

e. Flashlight

f. Brunton Compass

g. Hand level

h. Binoculars

i. Leather or cotton gloves

Gloves of any type protect hands during hard or heavy labor. Sometimes groundwater sites will require hiking through thick brush or crossing fences as well as the use of bailers to collect samples from wells without pumps. Gloves can be a hand-saver at these times. Leather gloves provide better protection, but can get pretty hot during the summer. Cotton gloves breathe better, but provide less protection. Combinations may be the best choice.

i. Key(s)

Some public water supplies and private wells have restricted access. The Branch will have a set of keys to enable samplers to get to the sampling site. Sites that require keys will have a key in the file folder for that site. Most public water suppliers do not like to have too many keys not under their control; only one key may be given to the Branch so do not lose the key. Always check any folder for keys.

C. Sampling Supplies

All supplies are disposable to aid in cross contamination reduction. The Equipment and Supply Manager is responsible for ensuring all sampling containers meet Groundwater Section standards as shown in **Attachment 3** and the Division of Water Watershed Management Branch; Department For Environmental Protection Chemical Hygiene Plan. Project Supervisors are also responsible for ensuring proper containers are used by sampling personnel. All sample containers must be factory cleaned to specifications dependent on the ultimate use of the container (See **Attachment 3** for the complete list of cleaning specs and for the proper container for each type of parameter the laboratory might be analyzing). Note that containers are **NOT** interchangeable because of the cleaning standards required. However, the liter sized amber glass containers may substitute for any other container, except VOC containers or any specialized containers, in an emergency.

Any equipment that uses batteries should be checked for 1) current battery power, if possible, and 2) if extra batteries are available. Changing batteries every time a piece of equipment is used is not feasible or good use of government money. Use batteries as long as possible, but make sure spares are available in the field. If none are to be found, inform the Equipment and Supply Manager, and he will replenish the supply. The digital cameras have time remaining indicators for batteries currently in the camera. TEST batteries in the camera before leaving to ensure you get the pictures you need. Write in the amount of time left on the battery in the camera so the next person will know what to expect. There is a space for time remaining on the equipment sign-out sheet.

1. Supplies required for a typical sampling run

a. Sample containers

i. 1000 (or 950) ml amber glass jars

Used for collection of water for analysis of pesticides, herbicides and caffeine. “Duplicate” samples are also collected in these containers, but duplicates are not collected at every site.

ii. Boston Rounds (HDPL)

Used for the collection of nutrients, bulk (water chemistry, NO₃-N, NO₂-N and major anions) parameters and total and dissolved metals analysis.

iii. 40ml amber glass pre-preserved with HCl

Used for collection of volatile organic compounds (VOCs).

iv. 120ml amber glass

Used for collection of glyphosate.

v. 250ml HDPE wide mouth jar

Used for Alkalinity only-fill completely leaving no head space.

b. Specialized containers

Specialized containers may be obtained from the appropriate laboratory or from your Project Manager or the Equipment and Supply Manager.

i. Bacteria sample containers

ii. Radionuclides sample containers.

c. Preservation Supplies

i. Sulfuric Acid Ampoules

Concentrated (98%) sulfuric acid (in 2ml vials) is used to preserve samples collected for Nutrients (NH₃, TKN, TOC, and Total Phosphorus) analysis.

ii. Nitric Acid Ampoules

A 70% concentration of nitric acid (in 2ml ampoules) is used to preserve samples collected for dissolved and total metals analysis.

iii. Hydrochloric Acid

5ml plastic vials of 1:1 concentration hydrochloric acid used to preserve Herbicides/Caffeine and Duplicate samples.

d. Other Supplies

i. Filters and tubing

Some samples must be filtered. The 45-micron filters and medical grade silicon tubing used by the Branch meet all criteria for filtering. Dissolved metals samples and, for some laboratories, ortho-phosphate samples are filtered by Branch personnel.

ii. Latex gloves

Latex gloves shall be worn during every phase of the sampling procedure. This not only protects the sample from contamination, it protects the sampler from any potential contamination present in the sample.

iii. Chains-of-Custody (CoCs)

Fill out CoCs in accordance with GWB 100.2

iv. 3-Ring Binder

A 3-ring binder will keep site material together and clean. It is big enough so that loss of material is minimized, and the sleeves keep things dry. This binder will also hold the CoCs for all the sites to be sampled. Contact your Project Manager for the CoCs you will need.

v. Scissors

Especially useful when working with rope or string for bucket or bailer sampling, but also a good general-purpose tool.

IV. Sampling Procedures

A. Step One – Fill out forms

Fill out a Site Safety Inspection Form (See **Attachment 1**). A completed site form for each site visited will accompany every sampler on the route being sampled. This form will be for an ordinary day at the site. Any changes in the site or weather that could change the safety of the site should be noted directly on the completed form. Return the changed form to the program/project coordinator at the end of the sample run.

Fill out the appropriate program/project CoC for the site in accordance with GWB SOP 100.2 (Chains-of-Custody).

B. Step Two – Label containers

Label all sample containers for the site using a black or blue Sharpie™ – Fine point for container bodies, Ultra fine point for lids and paper labels.

1. Label Boston rounds on side of container;
2. Label 1000ml/950ml amber glass on lid;
3. Label 40ml amber glass using the adhesive labels included in the boxes by the manufacturer;
4. Label 120ml on lid or use the adhesive labels included in the box by the manufacturer;
5. Label 250ml HDPE wide mouth jar on side of container.

Labeling of sample containers will consist of:

1. Eight-digit well/spring number (AKGWA #)

2. Location (site) name, including county
 3. Parameters for which an analysis is to be made (abbreviated if necessary)
 4. Preservation method(s)
 5. Date and time of sampling event: (Use 24-hour clock and note if using Central Time instead of Eastern Time)
 6. Initial(s) of sampler
- (All this information can be found on the CoC.)

EXAMPLE:

9000-1010
Jack's Spring
Goshen County
Dissolved Metals
Filtered, HNO₃, Ice
2/2/02 16:45 JRM

C. Step Three – Decontaminate Equipment

Decontamination must be performed prior to each sampling event using equipment that may become contaminated. The Groundwater Section uses, as much as possible, expendable supplies to keep the necessity of decontamination to a minimum. However, Teflon buckets, ropes used in conjunction with the Teflon bucket and field meter probes all must be decontaminated prior to each use. To decontaminate equipment other than field meters, rinse with clean water, rinse with 10% HCl, then rinse twice again with de-ionized water. For field meter decontamination, rinse with de-ionized water only before and after use.

D. Step Four – Collect samples

Always fill containers as full as possible. The ESB laboratory requires at least 250 ml of sample to run analyses (excluding VOCs and Glyphosate). Therefore, fill sample containers at least ¼ full. VOC bottles must be filled completely without air bubbles. Try to get clean samples; don't pick up stirred up material from the last sample (always sample upstream from yourself). Sampling is best done at a point where water is restricted so that it runs more swiftly (when possible). Obviously, turbid water will result in cloudy to muddy samples, but try to ensure any turbidity in the sample is from naturally turbid water, not from something you stirred up.

D. (1) Collecting Bacteria Samples

Bacteria samples are not regularly collected as part of the Ambient Groundwater Monitoring Network. However, bacteria are analyzed for various research projects and groundwater-related complaint investigations. Bacteria samples are collected in 100 mL plastic containers. Only raw water samples shall be collected. If you are sampling a well or spring that has a treatment system, ensure that you can collect samples from a bypass valve or pretreatment (i.e. at the spring mouth or bailed from the wellhead).

When collecting bacteria samples be aware of and follow the directions noted above in Step Four regarding clean samples. For spring samples, open the container and place it in the water upstream of yourself, facing upstream. Fill precisely to the 100 mL mark on the bottle. For well samples, place the container directly beneath the spigot and fill precisely to the 100 mL mark on the bottle. Avoid collecting samples from swivel faucets and frost-proof hydrants.

E. Step Five – Field Measurements

Collect field measurements data: temperature, conductivity, pH, and estimate spring flow in cubic feet per second (cfs). Conductivity and pH meters should be put into water as soon as possible, as they tend to read more accurately if they have time to become acclimated. Record the information from the meters after sampling to ensure the most consistent and accurate readings. Note the measurements directly on the CoC, or use a notebook and put the data on the CoC later. Field meters are cleaned and calibrated in the laboratory on a regular basis and a log book for calibration is kept with each meter. Every meter has a temperature element to it, but these can only be calibrated by the manufacturer. Each meter box contains a separate thermometer that can be used for temperature measurements, if meter readings are suspect. In the event that a meter will not work properly, nor calibrate, note the problem in the comments field on the CoC. Rinse the probe with de-ionized water when measurements are complete. Each meter box also contains electrode storage solution. At your last site of the day, following the final rinse, fill the red cap with electrode storage solution prior to replacing.

F. Step Six – Filter and Preserve

Filter and preserve appropriate samples according to the following: For each container of nutrients, add the contents of one vial of H₂SO₄. For each container used for total metals analysis, add the contents of one vial of HNO₃. For each

sample used for dissolved metals, first filter the sample by running the water through a 0.45 micron filter via a two foot length of medical grade silicon tubing. A peristaltic pump is used to induce the water through the filter. After filtration, add the contents of one vial of HNO₃ to the container for preservation of the sample. For each Herbicides/Caffeine sample and each Duplicate sample add the contents of one vial of HCl (1:1). Place all samples on ice in the coolers.

WARNING: Wear latex gloves for hand protection and contamination prevention, and wear eye protection in case of splashing.

Fill in Field Measurements section of the CoC with the necessary information. (Note: The computer program we use can only show data for spring flow in cubic feet per second (cfs), so it is best to learn to estimate stream flow in this mode. However, a flow conversion table is available if you are not accustomed to this mode. Flow estimates are made by estimating the cross-sectional area of the channel and multiplying by the estimated velocity. This requires significant practice and it may help to study various USGS documents relative to flow gaging and estimation.) Clean up area, checking to make sure you have all your equipment, and move on to next site.

V. Sample Delivery and Clean-up

A. Sample Delivery

Complete CoC (e.g. place check mark in box beside each set of parameters you are requesting) and fill in any blanks that were not previously completed. Be aware of holding times especially for bacteriological samples. Deliver samples to the lab early so that they can begin sample preparation before the holding time has expired. Many bacteria analyses require the lab to begin the test within six hours after the sample was taken.

Deliver samples to proper laboratory. At the ESB lab, request that your completed CoCs be sent to Groundwater Section after the lab is finished with them.

B. Clean-up

Put unused supplies back into storage room. If you have partial boxes of containers left, check to see if you can consolidate your boxes with any that are already open. We don't have much space, and any consolidation means one less box to take up space.

Return equipment to the appropriate storage area. If it is dirty, clean it. There is a mild cleaning agent at the sink and there are some outside spigots if it is too big or too dirty for the lab. The cleaner cuts grease (or oil) well, so use it if you get the equipment into an oil spill or something similar.

Note any equipment problems in the remarks section of the sign-out sheet. If supplies are low, inform the Groundwater Section Equipment Custodian.

Return the vehicle the way you found it. Fill the gas tank and clean the vehicle if necessary. Refuel the vehicle at the motor pool or any sanctioned Fleet One Card gas station. The motor pool has an automated carwash that will clean the outside of vehicles. There is also a vacuum available to clean the inside. Put any receipts for gas, oil, or anything else bought for the vehicle into the log book pouch (inside the front cover of the log book). Make sure you enter appropriate information about your purchases in the log book.

Park the vehicle with the other DEP vehicles, complete the log book, and return all keys and log book to appropriate places.

References:

USEPA, Region IV, 2008, Field Branches Quality Management System and Technical Procedures, cited October 2008, <http://www.epa.gov/region4/sesd/fbqstp/>.

USEPA, Region IV, 1990, Field Health and Safety Manual, 31 p.

KY Division of Water, 2006, Latitude and Longitude Collection: GPS Procedures, KDEP, Frankfort, KY.

KY Division of Water –Watershed Management Branch, 2008, Chemical Hygiene Plan, KDEP, Frankfort, KY.

DeLorme, 1997, *Kentucky Atlas & Gazetteer*, Yarmouth, ME.

KY Division of Water – Watershed Management Branch, 2008, GWB 100.2.1 Completing Chains-of-Custody, KDEP, Frankfort, KY.

ATTACHMENT 1

SITE SAFETY INSPECTION FORM

**Personal Protective Equipment (PPE)
Worksite Hazard Assessment**

Part A	
Site ID:	NOT/COM #: GPS:
Part B	
Circle Hazard/s Located at the Site being Assessed Sufficient to Require PPE. Comment in Part C.	
HEAD <u>POTENTIAL INJURY/HAZARD</u> 1. Struck By 2. Struck Against 3. Electrical 4. Temperature 5. Other _____	EYES/FACE <u>POTENTIAL INJURY/HAZARD</u> 1. Airborne 2. Chemical 3. Flash/Light/UV 4. Other _____
RESPIRATORY <u>POTENTIAL INJURY/HAZARD</u> 1. Oxygen Deficiency 2. Airborne Particles a. Dusts b. Fumes c. Mists 3. Airborne Contaminants a. Gases b. Vapors 4. Combinations 5. Temperature 6. Other _____	HAND/ARM <u>POTENTIAL INJURY/HAZARD</u> 1. Cut/Abrasion/Puncture/Crush 2. Electrical 3. Chemical 4. Biological 5. Temperature 6. Body Fluids 7. Cumulative 8. Strain 9. Other _____
FOOT/LEG <u>POTENTIAL INJURY/HAZARD</u> 1. Cut/Abrasion/Puncture/Crush 2. Electrical 3. Chemical 4. Biological 5. Temperature 6. Struck by/Against 7. Strain 8. Other _____	TORSO/WHOLE BODY <u>POTENTIAL INJURY/HAZARD</u> 1. Cut/Abrasion/Puncture 2. Electrical 3. Chemical 4. Biological 5. Temperature 6. Struck By/Against 7. Body Fluids 8. Strain 9. Cumulative 10. Slip/Trip/Fall a. Same Level b. Different Level 11. Entrapment 12. Immersion/Submersion/Water 13. Other _____
AUDITORY <u>NOISE LEVEL</u> 1. Ambient Level Above 85 dBa 2. Impact Level Above 85 dBa	
PART C GO/NO GO COMMENTS	

**WORKSITE ASSESSMENT SURVEY GUIDANCE
PERSONAL PROTECTIVE EQUIPMENT (PPE)**

<p>I. 29 CFR 1910.135 HEAD PROTECTION</p> <ol style="list-style-type: none"> 1. HARD HAT 2. HARD HAT 3. HARD HAT/NON-METALLIC 4. HARD HAT W/WINTER LINER OR SWEAT BAND 	<p>29 CFR 1910.133 EYES AND FACE PROTECTION</p> <ol style="list-style-type: none"> 1. SAFETY GLASSES W/SIDESHIELDS, GOGGLES, OR FULL FACESHIELD 2. NON-VENTED GOGGLES OR FULL FACESHIELD 3. FILTER OR TINTED LENS
<p>29 CFR 1910.134 RESPIRATORY PROTECTION</p> <ol style="list-style-type: none"> 1. SCBA OR SUPPLIED AIR RESPIRATOR 2. USE MSDS TO DETERMINE FILTER REQUIREMENT 3. USE MSDS TO DETERMINE FILTER REQUIREMENT 4. USE MSDS/DETERMINE FILTER REQUIREMENT/CONFIRM W/RESPIRATOR PROGRAM ADMINISTRATOR 5. COLD-COVER MOUTH/NOSE, HEAT-SCBA OR SUPPLIED AIR (TEMPERED) 	<p>29 CFR 1910.138 HAND/ARM PROTECTION</p> <ol style="list-style-type: none"> 1. GLOVES-CANVAS, LEATHER, MESH, KEVLAR 2. DIELECTRIC GLOVES/SLEEVES 3. APPROPRIATE GLOVES/SLEEVES OR COVERALLS 4. CLOTHING/GLOVES/COVERALLS/BARRIER CREAM/REPELLANT 5. GLOVES/CLOTHING 6. LATEX/NITRILE GLOVES (BBP KIT) 7. GLOVES/RESTRAINTS 8. ADEQUATE TOOLS/ASSISTANCE FROM OTHERS
<p>29 CFR 1910.136 FOOT/LEG PROTECTION</p> <ol style="list-style-type: none"> 1. APPROVED SAFETY SHOE/PROPER CLOTHING 2. NON-METALLIC SAFETY SHOE/PROPER CLOTHING 3. RESISTANT FOOTWEAR/PROTECTIVE CLOTHING 4. COVERALLS/BARRIER CREAM/REPELLANT 5. COLD-INSULATED FOOTWEAR/CLOTHING HEAT-RESISTANT FOOTWEAR/ADEQUATE CLOTHING 6. SAFETY SHOE/ADEQUATE CLOTHING 7. PROPER TECHNIQUES/ASSISTANCE 	<p>29 CFR 1910. MISCELLEANEOUS STANDARDS - TORSO/WHOLE BODY</p> <ol style="list-style-type: none"> 1. ADEQUATE CLOTHING 2. MAINTAIN DISTANCE 3. PROTECTIVE APRON/COVERALLS, SUITABLE FOR MATERIAL 4. PROPER CLOTHING, BARRIER CREAM, REPELLANT 5. COLD-INSULATED JACKET/COAT, HEAT-APPROPRIATE CLOTHING WORK/REST INTERVALS 6. PROTECTIVE CLOTHING/WARNING DEVICES/GUARDS 7. PROTECTIVE APRON, COVERALLS 8. PROPER WORK HABIT/ASSISTANCE/APPROPRIATE TOOLS 9. BODY MECHANICS/PROPER TOOLS/WORKSTATIONS 10. PROPER FOOTWEAR/HARNES/TETHER/LIFELINE/ ASSISTANCE 11. DO NOT ENTER 12. PERSONAL FLOTATION DEVICE/TETHER/LIFELINE
<p>29 CFR 1910.95 HEARING PROTECTION</p> <ol style="list-style-type: none"> 1. APPROPRIATE NRR EAR PLUGS OR MUFFS 2. APPROPRIATE MRR EAR PLUGS OR MUFFS 	

ATTACHMENT 2

FIELD SAMPLING CHECKLIST

Sampling Checklist

1. **Containers:**
 - 2 - Cubitainers per site (1 for bulk parameters and 1 for nutrients)
 - 3 - Boston rounds (Hard Plastic) per site for metals (total, filtered dissolved, and 1 to filter from – NOTE: only 2 get filled with water, the third is filled as the blank one is filtered)
 - 2 - 950ml Amber glass per site for N/P Pesticides and Herbicides/Caffeine
 - 3 - 40ml Amber glass per site for VOCs
 - 1 – 250ml wide mouth Nalgene jar
 - ? - Containers for occasional parameters that are not part of the regular suite of samples (e.g. oil and grease [uses 950ml amber glass])

2. **Preservatives:**
 - Sulfuric Acid to preserve nutrients (70% concentration)
 - Nitric Acid to preserve metals (70% concentration)
 - Hydrochloric Acid to preserve Herb/Caffeine and Duplicate samples
 - Ice

3. **Equipment:**
 - Vehicle (May need to sign out days in advance to ensure availability)
 - Mobile phone
 - Peristaltic pump
 - Tubing (at least one 2-foot length per site + 1 extra for emergencies)
 - Filters (1 per site + 1 extra for emergencies)
 - Meter(s) and thermometer for field measurements
 - Cooler(s)
 - Trash Bags

4. **Other:**
 - Chains-of-Custody (one for each site)
 - VOC Trip Blank Chain-of-Custody (one for each day's sampling)
 - Sharpies (for marking containers)
 - Backpack for carrying samples to and from springs
 - Latex gloves
 - Gate Key (if necessary)
 - Out-of-Office Wizard/Phone Message
 - Field Office Notification
 - Supervisor Notification

5. **Optional/Occasional:**
 - Camera
 - GPS Unit
 - Brunton
 - Hand level
 - Flashlight
 - Topo Maps
 - Road Maps
 - Bucket and rope or string

6. **VOC Trip Blank** **Site Safety Sheet (One for each site)**

ATTACHMENT 3

SAMPLING CONTAINERS

Sampling Containers Used by Watershed Management Branch

- 1. HDPE Boston Rounds.** High Density Polyethylene container certified to meet or exceed EPA standards for metals, cyanide and fluoride. Used for collecting Total and dissolved metals, Nutrients and Bulk Parameters.
- 2. Amber Glass, 40ml Capacity.** Amber borosilicate glass certified to meet or exceed EPA standards for volatiles. Pre-preserved with hydrochloric acid. Used for collecting VOC samples.
- 3. Amber Glass, 950 - 1000ml Capacity.** Amber glass certified to meet or exceed EPA standards for metals, pesticides, and semi-volatiles. Used for collecting pesticides, herbicides, caffeine and duplicates. This is an all-purpose container. If there is a shortage of other containers (except bacteria and VOC containers), this one, and only this one, will substitute for any of the others.
- 4. Amber Glass, 120 ml Capacity.** Amber glass certified to meet or exceed EPA standards for metals, pesticides, and semi-volatiles. Used for collecting Glyphosate samples only.
- 5. HDPE Wide Mouth Nalgene Jar, 250 ml Capacity.** High Density Polyethylene container certified to meet or exceed EPA standards. Used for collecting Alkalinity samples only – MUST BE FILLED COMPLETELY, NO HEAD SPACE.