

Appendix G
Example Dye Testing River Sampling Field Sheet

River Dye Sampling

Field Data Sheet

Date: _____ Field Crew: _____ Purpose of Sampling: _____
Site: _____ Field Conditions: _____

OBSERVATIONS

Staff Gauge Reading (Start)
Staff Gauge Reading (End)
Sampling device used:
Fluorometer calibrated?
Odor: None , Low , High , H₂S , Fuel Like , Other:
Dye Visible? Yes , No
Turbidity: None , Low , Medium , High , Heavy Silts
Comments:

If measured turbidity >5 NTU, field filter sample and reanalyze

Field Parameters and Sample Information

Station ID	Time	coordinate/ coordinate	Depth from MP to water surface (ft)	Sample Water Depth (ft below water surface)	Sample Distance from wall (ft)	Temp. (C)	Turbidity (NTU)	Rhodamine WT Conc. ppb	QC Sample? Duplicate/Field Blank?	Comments
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Trash picked up?

SIGNED/SAMPLER: _____

Appendix H

Example Temporary Drawdown Inspection Log

Date/Time
Weather since last inspection

Personnel

Extraction Well Status

SV or 8th St?	Well #	Previous totalizer	Date/Time	Current Totalizer	Date/Time	Minutes since last reading	Volume Pumped	Average Pumping Rate	Condition of discharge hose/piping	Maintenance Performed

Storage Tank Status

Offsite Disposal

SV or 8th St?	Wells feeding tank	Depth to water	Tank Capacity	Volume in tank	Capacity Remaining	24-hour Capacity Available?	Maintenance Performed	Volume extracted for offsite disposal	Trip # (from Manifest)	Notes

Signed:

Appendix I
Sediment Sampling Field Operating
Procedures

Global Positioning System Procedures and Station Positioning

Purpose

FOP-01 provides guidelines for collecting horizontal coordinates during field activities using a global positioning system (GPS) unit. Accurate surveys of sampling locations and boundaries are necessary to determine precise spatial reference points for characterization of site conditions. Precise positioning of station locations is required to meet the sampling goals. Both accuracy (the ability to define position) and repeatability (the ability to return to a sampling station) are essential. Positioning for all surveys will be achieved using a GPS capable of locating stations with a horizontal accuracy and repeatability of ± 1 meter.

Scope

The method described for the collection of horizontal coordinates is applicable to a Trimble Pathfinder Geo XH or comparable GPS receivers. The program precision and accuracy requirement for location coordinates is ± 1 meter (3.3 feet). To achieve real-time data with a submeter accuracy level with no post-processing of data using GPS Pathfinder Office, the following criteria must be met:

- Minimum number of satellites = 4
- Maximum position dilution of precision (PDOP) = 6
- Minimum signal-to-noise ratio (SNR) = 4
- Minimum elevation = 15 degrees

If any of these criteria cannot be met because of weather conditions, time of day, or obstructions of the sky, such as buildings or foliage, resulting in a less-than submeter accuracy, the following should be performed:

- Mark the location on the applicable aerial photograph or map, estimate the distance from two known locations, and note in the field logbook so, at a minimum, a general location position can be obtained.
- The location also should be marked using a weighted buoy, with a reading taken when conditions are optimal.

Equipment and Materials

- Trimble Pathfinder Geo XH or comparable GPS receiver and compatible data logger
- Field logbook
- Buoy with anchor and rope
- Aerial photograph or map of sampling area

Procedures and Guidelines

To obtain GPS coordinates, follow these steps:

1. Verify the GPS horizontal datum is set to Wisconsin South Zone State Plane Coordinate System, North American Datum of 1983 (NAD83) and the vertical datum is set to North American Vertical Datum of 1988 (NAVD88) and/or International Great Lakes Datum 1985 (IGLD85).
2. Verify the GPS is referenced to known survey control monuments (x, y, and z) surrounding the project site within the level of accuracy specified before field activities and upon return.
3. Place the GPS antenna over the location where coordinates are to be collected, and record coordinates in the field logbook, or log coordinates into the GPS receiver. If locations are to be logged into the receiver, readings must be collected every 5 seconds for a period of 1 minute (see manufacturer instructions on position logging). The data files recorded for each position must be named, including both the sample location identification and date recorded.
4. Download the data from the GPS unit to a personal computer daily record in the field logbook or appropriate field form as they are collected.

Positioning of the Sampling Vessel

To position the sample vessel, follow these steps:

1. Before daily departure of the sampling vessel, the sampling crew will be informed of the planned sampling locations. The sampling team will verify the GPS is referenced to known survey control monuments (x, y, and z) surrounding the project site before departure from the dock or launch ramp and upon returning after sampling activities.
2. Accomplish vessel navigation and positioning using GPS methodology.
3. Verify the GPS system antenna is in a “transit” mount, which will allow it to be removed and manually repositioned over the sampling point to acquire final “as-sampled” x, y position measurements.
4. Record information on the sample log form prior to acquisition of the sample. Annotate the sample log with the exact sampling location coordinates, date, time, weather, and water surface conditions, as well as any other relevant information associated with the acquisition of each sample.
5. Accomplish vessel anchoring using multiple anchors or spud poles during coring operations and the recording of position coordinates.

Key Checks and Items

- Charge and check batteries daily.

Reference

U.S. Environmental Protection Agency (EPA). 2008. USEPA Interim Guidance for Developing Global Positioning System Data Collection Standard Operating Procedures and Quality Assurance Project Plans, Revision 1.0. February.

Direct-push Technology Drilling and Sediment Sample Collection

Purpose

FOP-02 provides a general guideline for the collection of sediment samples using direct-push technology (DPT) drilling methods. Work will be conducted from a vessel over open water.

Scope

The method described for DPT sediment sampling is applicable for sediment sampling over exposed sediments and below the sediment-water interface within a waterbody. Specific equipment and the responsibilities of DPT drilling subcontractors are described in the contracting documentation.

Equipment and Materials

- Drilling equipment and tools for hydraulic DPT rig using continuous samplers
- Survey rod with a 6-inch round plate affixed to the bottom
- Equipment and supplies required for logging sediment core
- Analytical sample containers and sampling supplies
- Level D personal protective equipment (PPE), plus personal flotation device (PFD)

Procedures and Guidelines

To collect a sediment sample, follow these steps:

1. Position the DPT drill rig over the proposed sampling location. Record the location identification (ID), station positioning (x and y coordinates), weather conditions, personnel, and other relevant information.
2. If working from a vessel over open water, measure the depth from top of water surface to the top of sediment using a survey rod with a 6-inch-diameter round plate affixed to the bottom. Record the water depth to the nearest 0.1 foot.
3. Measure the DPT refusal depth from the water surface to obtain the total boring depth. Subtract the water depth from the total boring depth to derive the sediment thickness.
4. Verify nondedicated downhole equipment and sampling equipment are decontaminated.
5. Wear appropriate PPE, as required by the project-specific health and safety plan. Change gloves between sampling locations.
6. Collect subsurface sediment samples continuously to the refusal depth using a MacroCore sampler with a polycarbonate liner. Between sediment core locations, decontaminate the MacroCore sampler and downhole tools.
7. Confirm the drilling operators open the polycarbonate liner once removed from the MacroCore sampler and present it to the field staff for logging and sampling. Fill the sample containers using decontaminated sampling equipment. Separate sediment samples for inorganic and nonvolatile organic analyses and transfer them into disposable aluminum pans, and then

homogenize them by mixing with a stainless-steel spoon, and transfer them to the appropriate sample container. Remove large pebbles and cobbles from the samples before placing in jars.

8. Label, handle, and store the samples according to procedures outlined in the approved QAPP (Earth Tech, 2006). Record sampling data, such as depth, time, and date in the field log book or sediment core log. Discard unused sample according to the guidelines for investigation-derived waste (IDW).
9. Advance the DPT rig to the next sampling interval after a subsurface sediment sample is collected.
10. Obtain accurate and representative sediment samples. The drilling subcontractor will be responsible for obtaining accurate and representative sediment samples, informing the geologist and field technician of changes in drilling conditions, and keeping a separate general log of the sediment core locations.

Decontamination of Drilling Rigs and Equipment

To decontaminate drilling rigs and equipment, follow these steps:

1. Before the onset of drilling, after each core location, and before leaving the site, decontaminate heavy equipment and machinery using a phosphate-free detergent solution and high-pressure hot water at a designated area.
2. Then rinse equipment with potable water. The steam cleaning area will be designed to contain decontamination wastes and wastewater, and can be a high-density polyethylene-lined, bermed pad. A pumping system will be used to convey decontamination water from the pad to the drums.
3. Also decontaminate drilling tools (including rods, split spoons or similar samplers, coring equipment, auger bolts, augers, and casings) as described at the following times: (1) before the onset of drilling and (2) between core locations.
4. Before using a sampling device such as a split-spoon sampler to collect sediment samples for physical characterization or chemical analysis, clean the sampler by scrubbing with a potable water and phosphate-free detergent solution, rinsing with potable water, and then rinsing with distilled water. If equipment has come in contact with oil or grease, rinse the equipment with methanol, and then distilled water.

Key Checks and Items

- Verify the DPT rig is clean and in proper working order.
- Monitor the DPT operator thoroughly so that he or she completes the decontamination process between sampling locations.
- Determine if a quality control sample will be required at a sampling location.

Appendix J
Example Sediment Sampling Field Log



PROJECT :	TOP OF BARGE TO SED SURFACE (FT) :
PROJECT NUMBER :	TOP OF BARGE TO WATER (FT) :
CONTRACTOR :	WATER DEPTH (FT) :
EQUIPMENT : Geoprobe w/macrocore sampler	TOP OF BARGE TO REFUSAL (FT) :
LOGGER :	SED THICKNESS TO REFUSAL (FT) :

DATE : START : END :

DEPTH BELOW SURFACE (FT)			SEDIMENT DESCRIPTION	COMMENTS
DEPTH (FT)	PENETRATION (FT)	RECOVERY (FT)	SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	SAMPLE ID, QA/QC, ETC
		#/TYPE		
0				
1				
2				
3				
4				
5				
6				
7				

NOTES : _____

STAFF GAUGE No. and ELEV : _____
 STAFF GAUGE READING (FT) : _____
 WATER ELEVATION : _____
 SEDIMENT ELEVATION : _____
 X - COORDINATE : _____
 Y - COORDINATE : _____

Sediment Core Log Key

MAJOR DIVISIONS	GRAPHIC SYMBOL	GROUP SYMBOL	DESCRIPTION		
COARSE-GRAINED MATERIAL	CLEAN GRAVELS		GW	Well-graded gravel Well-graded gravel with sand	
			GP	Poorly graded gravel Poorly graded gravel with sand	
	GRAVELS		GW-GM	Well-graded gravel with silt Well-graded gravel with silt and sand	
			GW-GC	Well-graded gravel with clay Well graded gravel with clay and sand	
		GRAVELS WITH FINES		GP-GM	Poorly graded gravel with silt Poorly graded gravel with silt and sand
				GP-GC	Poorly graded gravel with clay Poorly graded gravel with clay and sand
			GM	Silty gravel Silty gravel with sand	
			GC	Clayey gravel Clayey gravel with sand	
	SANDS	CLEAN SANDS		SW	Well-graded sands Well-graded sand and gravel
				SP	Poorly-graded sands Poorly graded sand with gravel
			SW-SM	Well-graded sand with silt Well-graded sand with silt and gravel	
			SW-SC	Well-graded sand with clay Well-graded sand with clay and gravel	
		SANDS WITH FINES		SP-SM	Poorly-graded sand with silt Poorly-graded sand with silt and gravel
				SP-SC	Poorly-graded sand with clay Poorly-graded sand with clay and gravel
		SM	Silty sand Silty sand and with gravel		
		SC	Clayey sand Clayey sand and with gravel		
FINE-GRAINED MATERIALS		SILTS AND CLAYS		CL	Lean clay * Lean clay with sand or gravel * Sandy lean clay * Sandy lean clay with gravel * Gravelly lean clay * Gravelly lean clay with sand
				ML	Silt * Silty with sand or gravel * Sandy silt * Sandy silt with gravel * Gravelly silt * Gravelly silt with sand
			CH	Fat clay * Fat clay with sand or gravel * Sandy fat clay * Gravelly fat clay * Gravelly fat clay with sand	
			MH	Elastic silt * Elastic silt with sand or gravel * Sandy elastic silt * Sandy elastic silt with gravel * Gravelly elastic silt * Gravelly elastic silt with sand	
			OL/OH	Organic silt * Organic silt with sand or gravel * Sandy organic silt * Sandy organic soil with gravel * Gravelly organic soil * Gravelly organic soil with sand	
			OH	Organic clay * Organic clay with sand or gravel * Sandy organic clay * Sandy organic soil with gravel * Gravelly organic soil * Gravelly organic soil with sand	

CONSISTENCY

Penetration of thumb:
<0.25 cm = hard (H)
0.25 - 2.0 cm = firm (F)
2.0 - 4.0 cm = soft (S)
>4.0 cm = very soft (VS)

CEMENTATION

N = not cemented
W = weakly cemented
M = Moderately cemented
S = Strongly cemented

STRUCTURE

H = Homogeneous
S = Stratified
L = Laminated
M = Mottled

COLOR

from Munsell chart

MAXIMUM PARTICLE SIZE

SC = Small Cobble
CP = Coarse Pebble
MP = Medium Pebble
SP = Small Pebble
CS = Coarse Sand
MS = Medium Sand
FS = Fine Sand
VFS = Very Fine Sand
Z = Silt

SA = Sub-angular
VA = Very angular

ODOR

N = None
UNC = Unclassified
S = Sulfur-like

PHC = Petroleum hydrocarbon-like

Quantifying Descriptors

Strong
Moderate
Faint

Moisture Content

Wet
Moist
Dry

well graded = poorly sorted = grains of all different sizes mixed together
poorly graded = well sorted = grains are all same size