08-0138
SDMS 41306

Corporate Environmental Programs
General Electric Company
100 Woodlawn Avenue, Pittsfield, MA 01201

January 20, 2003

Mr. Dean Tagliaferro
US Environmental Protection Agency
c/o Weston Solutions, Inc.
10 Lyman Street
Pittsfield, MA 01201

Re: GE-Pittsfield/Housatonic River Site
Upper ½-Mile Reach (GECD800)
Seepage Meter Protocol

Dear Mr. Tagliaferro:

This letter transmits the revised seepage meter protocol (Appendix A) as requested by your December 31, 2002 conditional approval letter for GE's September 9, 2002 submittal entitled *Isolation Layer TOC Sampling*. Please note the revised protocol addresses items 2 through 7 of your letter. Due to constraints imposed by weather conditions, GE proposes to install the seepage meters during base flow conditions in July or August 2003 and submit the report (as proposed in the September 9, 2002 submittal) within six weeks following installation. This schedule assumes no weather related delays or associated difficulties in obtaining measurements.

If you have any questions, please contact me.

Yours truly,

Andrew T. Silfer/MOG

Andrew T. Silfer, P.E.
GE Project Coordinator

ATS/dmn
Attachment
cc: T. Angus. MDEP
R. Bell, MDEP
J. Bieke, Shea & Gardner
M. Carroll, GE
T. Conway, EPA
C. Fredette, CDEP
R. Goff, USACE
M. Gravelding, BBL
S. Gutter, Sidley Austin Brown & Wood
N. Harper, MA AG
Mayor S. Hathaway, City of Pittsfield
R. Howell, EPA (electronic)

H. Inglis, EPA
J. Morris, Weston (electronic)
S. Messur, BBL
K. C. Mitkevicius, USACE
T. O'Brien, MA EOEA
B. Olson, EPA
S. Steenstrup, MDEP
A. Weinberg, MDEP
Public Information Repositories
GE Internal Repositories

Appendix A - Seepage Meter Protocol

Introduction

A seepage meter is used to collect groundwater that is flowing through the sediments and into a water body. The seepage meter is placed into the sediments for a known period of time; the volume of water collected in an expandable bag attached to the meter is proportional to the surface area covered by the meter and the groundwater discharge rate. The times of instrument installation and sample collection are recorded, as is the volume of water collected in the expandable bag. A volumetric flow rate can then be determined from these measurements. A seepage velocity is then determined based on the cross-sectional area of the meter exposed to the sediment bed. The seepage meters shall not be installed or monitored during periods of heavy rain events or when the river level is rising. The seepage meter installation will be targeted for base flow periods with relatively stable water levels during the monitoring period. Weather forecasts will be reviewed prior to field activities to ensure that an appropriate period has been selected.

Materials

The following materials will be available, as required, during seepage meter installation and water collection:

Personal protective equipment (as required by the Health and Safety Plan);
Waders;
Seepage meter, protective crate, elastic cord;
Water collection bags (polyethylene);
Flexible tubing and clamps;
Measuring tape;
Graduated cylinder;
Funnel and tubing;
Field notebook and camera;
Waterproof watch;
Waterproof marker;
Water.

Seepage Meter Construction

The most commonly used seepage meter is referred to as a Lee Meter. The seepage meter, as designed by Lee (1977), consists of a cut 55-gallon drum with two fittings cut into the bottom of the drum. The surface area of a 55-gallon drum is approximately 406 square inches (2.82 square feet). The drum is typically cut to be no more than 12 inches in height. Two small (0.5- to 1-inch) holes are cut into the drum bottom and leak-proof fittings affixed in these small holes. On one hole, a pressure relief valve is installed. On the other hole, a flared fitting and a valve are affixed so that flow through the fitting can be turned on and off, and an elastic bag can be attached to allow measurement of changes in water volume. The polyethylene accumulation bag will also be fitted with a valve, as well as a quick-release fitting to attach it to the flared fitting. The partial drum/seepage meter is inverted and pushed into the lake bottom sediments and net change in water volume is monitored through time. A typical Lee seepage meter design is shown on Figure A.

Field Procedures

The following are the general steps for seepage meter installation (it should be noted that some of the specific procedures related to the coupling and uncoupling of the collection bag are subject to modification based upon the fitting or clamps used in the final construction of the meter assembly):

1. Position meter at the desired location.

2. Lower the seepage meter into the water and invert the meter below the water to eliminate possible air entrapment.

3. Push the meter (with tubing and bag **not** attached) approximately 6 (six) inches into undisturbed sediment. Tilt the seepage meter slightly, so that the connection between the meter and collection bag will be higher than the rest of the seepage meter (this will minimize possible air bubbles which might dislodge the meter). Record the depth of the water and the general nature of the sediments at the seepage meter location.

4. Once the meter is in place for at least 48 hours (preferably 72 hours), allowing pore pressures to equalize and air to vent, the collection bag will be attached. Above the surface purge the water collection bag of all air and water. Place a known volume of water (e.g., 200 milliliters) in the collection bag. A funnel with tubing to fit the inlet valve can be used. Close the inlet valve to the bag. Remove the funnel tubing from the valve and replace with tubing for connection to the meter. The tubing is clamped prior to attachment to the meter. Record the volume of water added. Attach the collection bag to the fitting on the meter. Unclamp the flexible tubing so that water from the seepage meter may enter the collection bag. Record the sampling initiation time.

5. Attach the protective crate over the meter and bag assembly.

6. Return approximately 48 hours later for collection.

For water collection the steps are as follows:

7. Enter water and locate the meter.

8. Observe the general area for notable conditions (e.g., turbidity, movement or tilting of the meter, groundwater leakage around the meter).

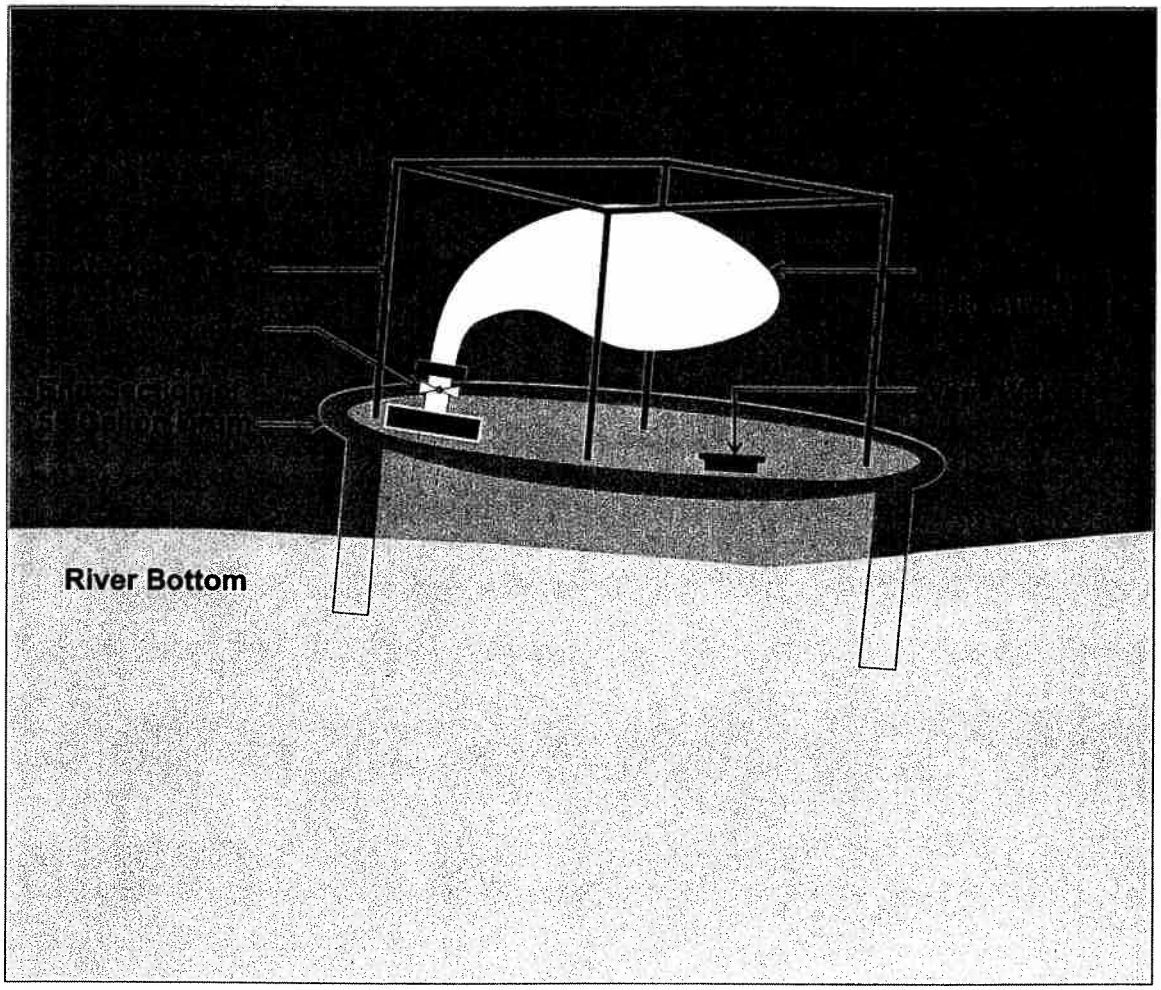
9. Remove protective crate.

10. Check the water collection bag for obvious changes in water volume. If the collection bag requires changing (e.g., if it is between 25 and 75 percent of its capacity), clamp the flexible tubing and remove the collection bag. If several weeks of monitoring result in continued low groundwater flux rates (i.e., collection bag is less than 25 percent of its capacity), the monitoring need not be continued. Additionally, if there were significant variations in river water level during the monitoring period, these conditions should be noted and the measurement repeated.

11. If desired, install new collection bag following procedures given above and replace the protective crate.

12. Record the volume of water collected, as well as collection time. If upon collection the collection bag is less than 25 or more the 75 percent of its capacity, then the measurement shall be repeated for a longer/shorter duration, or with a smaller/larger collection bag as appropriate.

13. Compute the volumetric flow rate from the change in the volume of water in the collection bag divide by the time of collection. To determine seepage velocity divide volumetric flow rate by the cross-sectional area of the meter (324 cm^2)



GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
UPPER ½-MILE REACH OF HOUSATONIC RIVER

TYPICAL SEEPAGE METER

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE A

01/16/03 SYR-D54-DJH
C:/20197021/20197g03.cdr