



MassDEP

**Massachusetts Department of Environmental Protection
Bureau of Water Resources
Watershed Planning Program**

STANDARD OPERATING PROCEDURE

Hinged Sampling Pole

CN 001.36

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**Prepared and
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List of Revisions

Revision Date	Revision	Pages #s	CN/ (Old CN if applicable)	Initials
11/1/24	Added title pages, signatures, time frame, and revision list	All pages	CN 001.35	JS
11/1/24	changed DWM to WPP	All pages		

Scope and Application:

As part of the Bacteria Source Tracking Program, it is sometimes necessary to sample water from stormwater pipes by way of a manhole access point. This type of sampling is typically associated with the search for illicit discharges of the sewer collection system into the stormwater collection system. Because this type of source search is conducted during dry weather and the safety issues involved with directly accessing the drainage pipes through the manholes, it was necessary to develop a device that could sample very shallow water that is several feet down a manhole.

To help with this type of sampling, WPP field staff came up with a design for a hinged sampling pole. It involves attaching a bottle holder, which is hinged in such a way to allow a 0-to-90-degree movement, to the end of a telescoping pole (Figure 1). The bottle holder is constructed from ½ inch PVC pipe shaped into an “L” with a 1½-inch rubber PVC cap attached to the bottom part of the “L”. The 120 ml IDEXX bottles fit snugly into the 1½-inch rubber cap. The bottle holder is attached to the end of the telescoping pole using a “T” bracket. The bolt holding the bottle holder to the bracket has a wing nut that allows adjustment of the stiffness in the swinging motion. Since the sample bottle swings under the end of the telescoping pole, seal the end as a precaution against cross contamination.



Figure 1

<u>Parts</u>	<u>Approx. Cost</u>	<u>Tools to Use</u>
Telescoping Pole	\$20.00	Hacksaw
½ inch Schedule 40 PVC pieces	\$3.00	Drill
1½ inch Rubber PVC cap	\$3.00	Pliers
4 bolts/nuts, 2 rubber washers, 2 nylon washers, brackets	\$4.00	Screwdriver
TOTAL ESTIMATED COST:	\$30	

The telescoping pole we selected is aluminum because it is lightweight and rust-free. It extends from 6' to 12'. The 1½-inch rubber PVC cap was specifically selected to hold the IDEXX 120-ml bottle securely. If there is a need to use another type of bottle with the hinged pole sampler, it should be tested prior to field use.

Construction:

To construct the sampling pole, start by removing the threaded end from the pole (most extension poles have a threaded end to attach a window brush or squeegee). Most threaded ends are pop-riveted on, and you can drill them out. Next, match up the T-bracket to the hole made by drilling out the rivet. Mark the location of the existing hole, and the location of the second hole. Drill the second hole through the pole. Attach the T-bracket with the two bolts, washers and nuts. Next, construct the bottle holder using ½ inch PVC pipe and a 1½-inch rubber PVC cap. Cut a 6-inch piece of PVC pipe for the upper arm of the “L” holder and a 2¼-inch piece for the lower arm. Using PVC glue, attach the 6-inch piece to the 2¼-inch piece with a 90-degree elbow. Seal both ends of the “L” with ½ inch PVC caps and glue. Drill a hole in the lower arm of the “L” and attach the rubber PVC cap with a nut and bolt. When attaching the rubber cap, use a large metal washer where the head of the bolt contacts the rubber cap so that the bolt cannot be pulled through the rubber cap and use a rubber washer where the nut contacts the PVC to reduce the chances of water entering the PVC pipe. Lastly, drill a hole in upper arm of the “L” and attach the bottle holder to the metal brackets with a bolt and a wing nut. When attaching the bottle holder, place nylon washers between the bracket and PVC to allow for a smoother swinging motion.

Field Use:

To use the hinged sample pole, first rinse the bottle holder end of the pole in the water you wish to sample. Quite often the water in stormwater drainage pipe is too shallow to rinse the bottle holder end of the pole in the sample water. If this is the case, rinse the bottle holder end with deionized water. This will reduce the possibility of contamination from the previous station (or contamination from the vehicle). Next, judge the distance from the manhole opening to the water in the drainage pipe and adjust the telescoping pole accordingly. Place an IDEXX 120-ml bottle into the rubber cap. Position the bottle holder so that it is in-line with pole (0-degree position) and remove the cap from the bottle.



Lower the end of the pole until the bottle holder touches the bottom of the pipe. Then lower the pole further using the hinge so that the bottle holder is moving towards the pole and the opening of the bottle is facing “upstream” and moving toward the water. Be careful to not touch the bottom of the pipe with the bottle opening.

Remove the pole and bottle from the manhole and cap the bottle.



If the water in the drainage pipe is very shallow, it may be impossible to collect 100ml. This is acceptable, because dilutions can be performed with less than 100ml. There are numerous situations you could encounter when sampling from a manhole, which cannot be identified completely in this SOP, where the procedure described above would be inappropriate. In these cases, use best professional judgment on how to use the hinged pole sampler and document what was done differently from the procedure described above.