

May 22, 2024

Mike App
Electro Scan Inc.
1745 Markston Road
Sacramento, CA 95825-4026

Re: Swordfish

Dear Mike App:

The Pennsylvania Department of Environmental Protection (Department) has reviewed the information and demonstration results provided by Electro Scan in relation to the Swordfish (Swordfish) technology which uses electric resistance to determine service line material.

The Department approves the use of Swordfish Electro Scan technology to:

1. Determine if a service line is partially or completely composed of lead.
2. Determine if a service line is partially or completely composed of galvanized iron or steel.
3. Determine if a service line is partially or completely composed of materials that are neither lead nor galvanized iron or steel.
4. Determine if a service line is considered non-lead (i.e. not lead or galvanized requiring replacement).
5. Determine the material transition locations within the pipe. By determining if the service line is lead, partially lead, galvanized requiring replacement, or non-lead, the Public Water System (PWS) **may*** use the results to update their Service Line Inventory without any further investigation (e.g. they will not need to physically verify the service line material by potholing or excavating).

*The Department **does not guarantee** Swordfish will work for all sites, service lines, or water systems.

***The PWS is responsible for ensuring whether each service line is / is not a good candidate for the utilization of the Swordfish technology.**

***The PWS is responsible for ensuring the results submitted to the Department in the Service Line Inventory using the Swordfish technology are accurate.**

***The PWS is responsible for determining if an additional record or verification is necessary to further support Swordfish technology results for each service line.**

This approval is limited to the following conditions:

1. The operator shall either be an Electro Scan employee (or Electro Scan contractor) trained to use the Swordfish device and accompanying software; or be a PWS employee (or PWS contractor) who has attended the manufacturer-provided 2-day training and follows the Standard Operating Procedures provided from Electro Scan.
2. The operator shall utilize the latest version of the Swordfish accompanying software.
3. The operator shall disinfect all service line identification and inspection equipment that has the potential to come in contact with drinking water with a 1% available chlorine solution. For the probe and attached line, this disinfection requirement can be met by maintaining a 1% available chlorine solution in the Swordfish unit's solution chamber.
 - a) The 1% available chlorine solution in the solution chamber shall be discarded and refilled before each service line test.
 - b) All other applicable equipment shall be swabbed with a new disposable cloth after soaking the cloth in a 1% available chlorine solution before each service line test. Clean latex or nitrile gloves shall be worn during this process.
 - New gloves and a new cloth shall be used at each site.
 - c) If a bucket is used to produce a 1% available chlorine solution, it may be used for up to 5 service line sites or until the solution has become visually contaminated. To maintain the solution, ensure that a lid is secured to the bucket whenever not in use.
 - d) Disinfection solution is not permitted to be discharged directly to surface waters without an NPDES permit. The Department recommends following the guidance in the fact sheet for *PLANNED AND UNPLANNED DISCHARGES OF CHLORINATED WATER TO SURFACE WATERS* ([3830-FS-DEP4861](#)).
4. When the service line is determined to be either lead or galvanized requiring replacement, the PWS shall follow the Risk Mitigation Measures identified in the enclosed Addendum.
5. A secondary confirmation test using an EPA recognized 3rd party lead test kit, will be administered in all surveys to confirm SWORDFISH electrical resistance testing results.
 - a) If the 3rd party lead test kit reads positive for lead and the Swordfish scan reads negative (or is inconclusive), both the Swordfish scan and the 3rd party lead test kit shall be administered again until both result in the same outcome; or, it is determined that Swordfish is not a suitable test method for that service line.
 - b) If the 3rd party lead test kit reads negative for lead and the Swordfish scan reads positive for lead, the material shall be classified as partially or completely composed of lead.
 - c) If the 3rd party lead test kit reads negative for lead and the Swordfish scan reads negative for lead, the material **may** be classified as identified by the Swordfish scan.

Use of this technology is approved subject to compliance with Title 25 Chapter 109 (the Safe Drinking Water Regulations), any other applicable laws and regulations, and any approved Public Water Supply construction and operation permit conditions.

If you have any questions, please email Bureau of Safe Drinking Water Permitting at RA-EPEPERMITTINGBSD@pa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Hess".

Michael J. Hess, P.E.
Environmental Program Manager
Permits Division

Enclosure

cc: Matt Campos <matt@electroscan.com>

ADDENDUM A: Risk Mitigation Measures for Swordfish Technology

- Provide notice to the owner of the affected service line, or the owner's authorized agent, as well as non-owner resident(s) served by the affected service line before the affected service line is returned to service. The notice should include the following:
 - There may be a short-term increase in lead released as a result of the disturbance to the service line.
 - After the service line is returned to service but before the water is used for consumption, the consumer should remove and clean all faucet aerators, flush their service line and all internal plumbing by opening all taps and letting the water run for at least 30 minutes, and re-install the cleaned aerators.
 - After the initial flush, the water should be run for 3-5 minutes before using, and use cold water for cooking and drinking to reduce exposure to lead in the water.
 - Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risk of heart disease, high blood pressure, kidney, or nervous system problems.
- Provide the consumer(s) with the following before the affected service line is returned to service:
 - A pitcher filter or point-of-use device that is NSF/ANSI 53 certified to reduce lead in drinking water.
 - Six months of replacement cartridges.
 - Instructions for use of the filter and replacement cartridges.
 - If the affected service line serves more than one residence, such as a multi-unit building, or a non-residential unit, the water system shall provide the pitcher(s), cartridges, and instructions to every residence in the building.