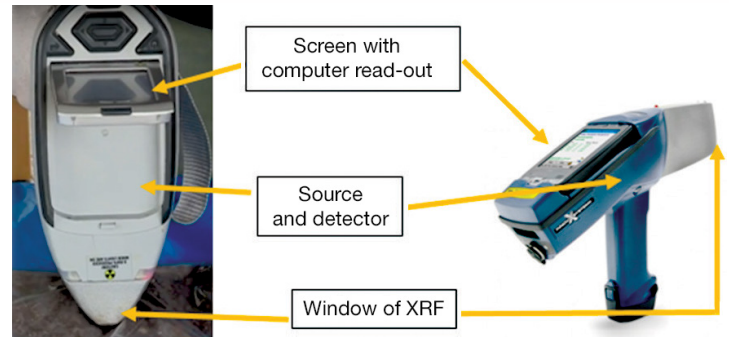


Using XRF Equipment at soilSHOPS

This fact sheet is designed to inform health and environmental professionals, agencies, and groups hosting a Soil Screening, Health, Outreach, and Partnership event (soilSHOP) on XRF equipment and its use during events. For more information on soilSHOPS visit: www.atsdr.cdc.gov/soilshop/.

What is XRF?

XRF stands for x-ray fluorescence and it is used in a hand-held instrument that can measure the concentration of an element in a soil sample. XRF technology uses either sealed radioactive sources or x-ray tubes to expose samples to x-rays. Sealed radioactive source XRFs always release radiation, while x-ray tube equipment generates x-rays only when it is in use. For this reason, x-ray tube technology is more often used in handheld XRF equipment.



Why do we use XRFs at soilSHOPS?

soilSHOPS are meant to provide rapid screening analysis of lead and other heavy metals in soil, which is followed by targeted one-on-one health education. The XRF equipment is powerful, cost effective, and provides a rapid method for analyzing soil samples (as little as 30 seconds), while producing reliable results suitable for soilSHOP goals.

How do we use the XRF equipment at a soilSHOP event?

Encourage participants to bring their soil samples in clear bags (such as zip-lock bags) prior to the event.



At soilSHOP events, XRF operators receive soil samples in clear bags.

Operators place sample bags on a stable, flat surface.

Operator places XRF equipment directly on soil sample.

Reading will be shown on the screen and operator logs the results accordingly.



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It is important that XRF operators are properly trained on instrument safety and use. Trained personnel are often found at health departments and environmental agencies.

What safety precautions can we take when using XRF equipment at soilSHOPs?

To promote health and safety and protect health when using XRF equipment, the soil screening team must:

- Never point the XRF at themselves or others when the primary beam lights are illuminated (x-ray on).
- Advise women of child-bearing age of the potential damage to a developing fetus from radiation exposure.
- Follow all manufacturers' training and instructions when handling the equipment.
- Place screening area away from the general public (about 3ft or more) to conduct XRF analyses.
- Advise XRF operators to use protective gloves for screening, and avoid eating or drinking in the soil screening area.
- Place disinfecting wipes, paper towels, and trash cans near or in the soil screening area.
- Conduct a health and safety briefing to ensure the screening area is set-up properly and caution signage is visible before the event.

Your states radiation protection agency, the state health department, and the company providing the equipment may have additional information. Regulations for the use of XRF equipment may vary by state and XRF technology. Registration of the XRF equipment with the radiation protection agency of your state may be required, and occupational safety and health regulations must be followed.

Where can we get XRFs?

XRF equipment may be rented from manufacturers and suppliers. soilSHOP partners (such as, EPA, local or state health departments) may also be able to provide the equipment for your event.

Keep in mind that it is easier to rent XRF equipment that uses x-ray tubes rather than a radioactive source. X-ray tube XRFs may have fewer regulations for use and do not require special shipping-unlike sealed radioactive source XRFs. However, some states will require registration of the equipment. In all cases, proper training in the use of XRF is necessary.

For more specific instructions regarding sample collection, logging, and measurements visit ATSDR soilSHOP website: https://www.atsdr.cdc.gov/soilshop/soil_screening.html. For questions or more information contact: soilSHOP@cdc.gov