U.S. Environmental Protection Agency
Office of Inspector General

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# At a Glance

## Why We Did This Review

We conducted this review to determine whether hyperspectral imaging (HSI) data is a useful tool for the U.S. Environmental Protection Agency (EPA) Office of Inspector General (OIG) to assess conditions and effectiveness of cleanup actions at Superfund, Brownfields, Resource Conservation and Recovery Act Corrective Action, and Underground Storage Tank sites.

HSI is similar in concept to satellite images. HSI is a type of remote sensing technology used on an airborne hyperspectral sensor that records reflected and emitted electromagnetic energy in hundreds of very narrow wavelengths. The data can assist in the identification and analysis of environmental conditions and certain contaminants.

**This report addresses the following OIG goal:**

- *Contribute to improved human health, safety, and the environment.*

**Send all inquiries to our public affairs office at (202) 566-2391 or visit www.epa.gov/oig.**

**The full report is at:**
**www.epa.gov/oig/reports/2014/20140926-14-N-0360.pdf**

# *Hyperspectral Imaging Can Be a Useful Evaluation Tool for Office of Inspector General Reviews Focused on Contaminated Land*

## What We Found

Starting in December 2007, in coordination with the U.S. Geological Survey, the OIG has been assessing the feasibility of using remote sensing technologies for OIG oversight of the effectiveness of EPA cleanup actions. We conducted HSI work at 40 sites in seven states.

**Hyperspectral imaging is an evaluation tool that has specialized value in designing and conducting Office of Inspector General assessments of cleanup actions.**

Our work shows that HSI is useful in identifying vegetative stress on land related to the presence of certain heavy metals, such as lead and arsenic. HSI is also useful for identifying debris on land. HSI can be useful during the scoping phase of an audit or evaluation to screen multiple sites and select a smaller, more relevant sample of sites for on-site visits and further review. In our work, when the HSI indicated little vegetative stress, we also found that sites were generally free of any significant residual contamination

HSI is one available evaluation tool for collecting information and designing an assignment under the broad objective of assessing, on a case-by-case basis, the effectiveness of cleanup actions on land. OIG assignment timeframes, costs and objectives must ultimately be factored in when deciding the most appropriate evaluation methods.