2016 Study: Field Validation of XRF Method for Measuring Soil Hg

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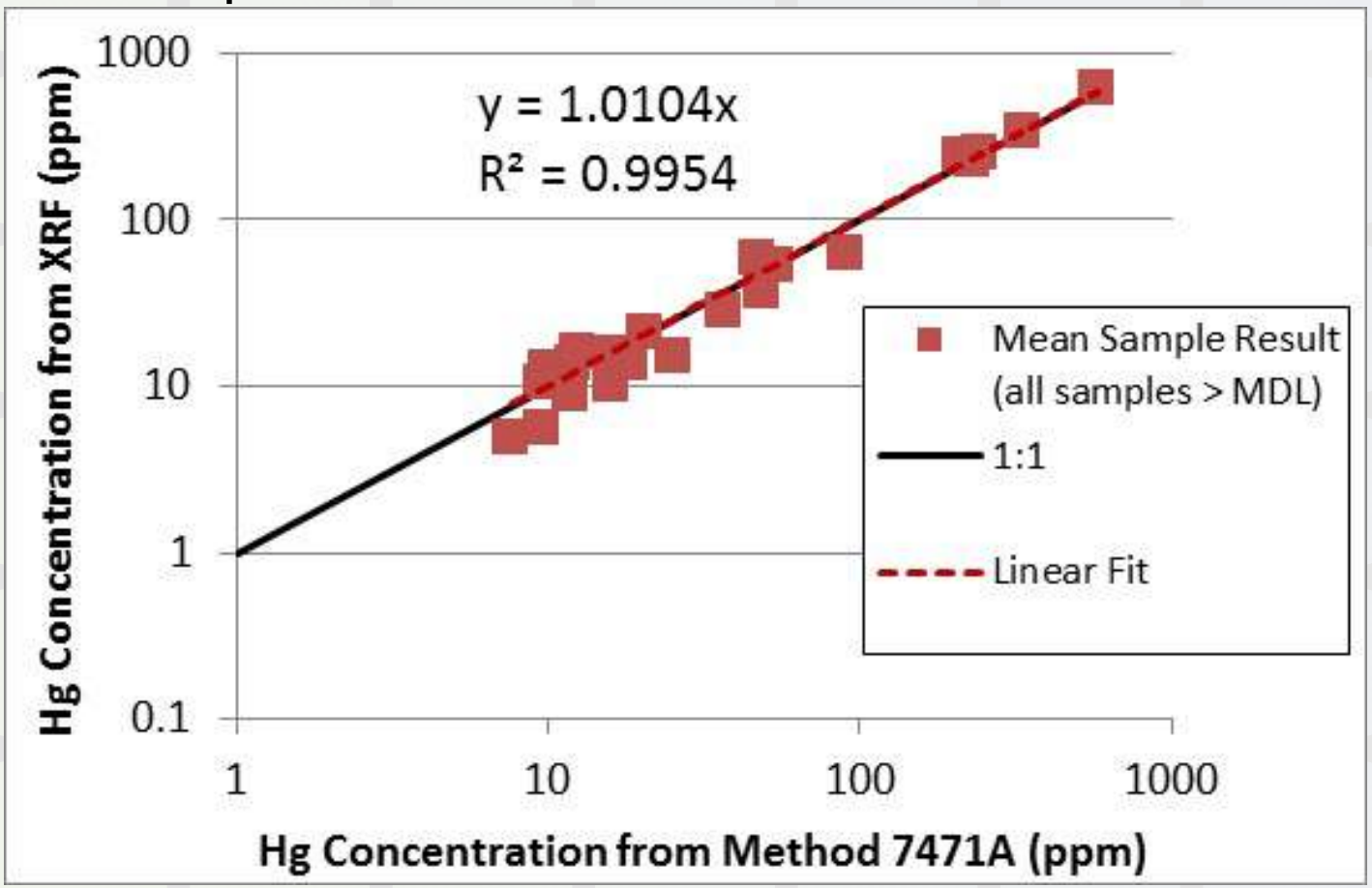
Preliminary Work in 2015

	Task	Finding
✓	Site-specific Hg calibration developed	Great calibration results (R^2 = 0.996) over range from 1 to 500 ppm Hg. Improved performance over factory calibration
✓	Method Detection Limit Study	Detection limit of 7.4 ppm Hg achieved with 60 sec analysis time
✓	Method Comparison Study	XRF results agreed with Method 7471A (R^2 = 0.995). Precision was equivalent (Mean RSD = 23%)
✓	Moisture Interference Study	Moisture not a significant interference

Preliminary Results

- Comparison of XRF and Method 7471A



2016 Work

- Task 0 - Literature review
- Task 1 - Field setup and protocol development
- Task 2 - Field validation
  - Coordinated field campaign with AECOM
    - In situ XRF field measurement before sampling
    - XRF field measurement on collected sample
    - Method 7471A lab measurement on collected sample
  - Real-time assistance with sampling extent for BMA delineation

2016 Work

- Task 3 – Additional laboratory validation
  - Shipment of Method 7471A samples to JMU for laboratory analysis using XRF
  - Result comparison between
    - In-situ XRF measurement
    - Field XRF measurement on collected sample
    - Method 7471A laboratory measurement on collected sample
    - Laboratory XRF measurement on collected sample
- Task 4 – Quantify method accuracy
  - Use of NIST standards
  - Spiking of South River soil samples

2016 Work

- Task 5 – Develop transferable calibration standards
  - Investigate thin-film technologies for making durable field calibration check samples
- Task 6 – (Optional) additional screening level use
  - Will depend on results of earlier tasks and demonstrated needs of field personnel
  - Could include
    - Assistance with BMA screening
    - On-site characterization of excavated material during remediation
    - Side-by-side comparison of other XRF units
- Task 7 – Data analysis and report preparation