

 **DELTA** Portable XRF for
Dynamic XRF

ENVIRONMENTAL TESTING

RCRA, Priority Pollutants & Heavy Metals

Site Characterization

Remediation & Monitoring

Contamination Tracking





THE DELTA LINE

A New Breed of Rugged, High Performance Handheld XRF

YOU CAN SEE AND FEEL THE DIFFERENCE at the outset – compact and robust from probe to trigger to display. On the inside, its remarkably sophisticated XRF technology is better, faster, and more responsive. From the initial boot-up to the final answer, the DELTA is a whole new breed.

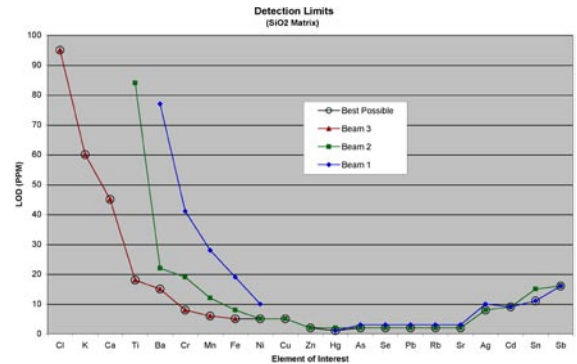
The DELTA line from Innov-X gives you the ultimate experience in field-portable handheld XRF analysis – super fast measurements with amazing accuracy, precision detection limits and light element measurement capability built into a compact single-chassis frame wrapped in robust industrial-grade body casing.

Intuitive, Customizable Soil Analysis Modes

The high-precision DELTA dramatically reduces testing times allowing hundreds more tests per day and significantly higher confidence in site surveys. This non-destructive handheld XRF measures 25+ elements per test, from Mg (12) to U (92), ppm levels to 100%. Analyze soils, solids, run-off streams, snow, ice, sludge, mixed waste & debris, wood, bagged soils, plastic corings, filters, wipes, coatings and more. Identify, monitor, screen and quantify the composition of your materials with confidence.

The DELTA offers two advanced methods of analysis:

- » **PowerShot Beam Mode:** Offers a fully optimized, multi-beam analysis method that provides exceptional LODs for all elements analyzed - heavy metals, transition metals, and light elements. PowerShot can be used to analyze the full element range, or to focus in on a particular element of interest, such as Cr, Cd, Ni, or Cu.
- » **SmartShot Beam Mode:** Uses a single incident beam setting optimized to deliver ultra fast results with solid LOD performance across the periodic table. SmartShot offers excellent sensitivity in the fastest testing time possible.



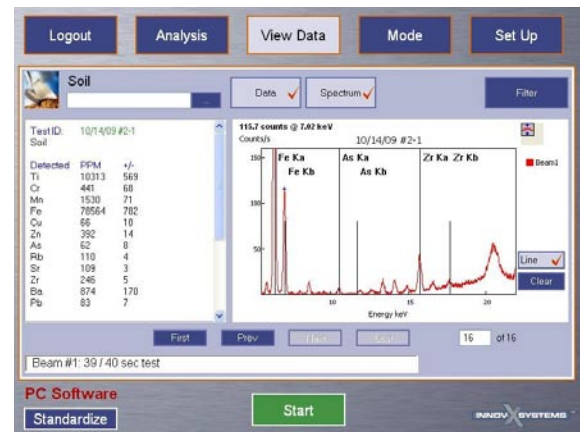
PowerShot Beam Mode

Note: LODs depend on matrix, sample preparation / presentation and measurement time.

Outstanding Data Management

Analyze Data

- » Qualitative identification of elements
- » Semi-quantitative analysis of elements
- » Moisture content corrections
- » Compton Normalization: "Internal Standard" for quantitative analysis without site-specific calibrations
- » Fundamental Parameters: "Standardless" for samples with high and low concentrations of several elements
- » Empirical Calibrations: Refine factory calibrations with user-generated, site-specific factors (slope, y-intercept), including ore-matrix-specific calibrations
- » Combination Algorithms: Fundamental Parameters with Empirical for Light Elements & complicated matrices
- » Re-evaluate stored data sets with added elements, new parameters, models or calibrations curves



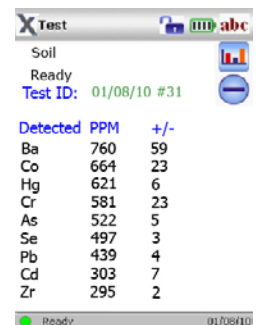
PC Screen Shot



Collect and View Data, Create Reports

- » Intuitive Innov-X PC Software can be utilized to remotely control the DELTA analyzer in a benchtop configuration
- » Sort comprehensive analysis results, quickly create reports, view and export spectra

The DELTA's transportable XRF Workstation is convenient for analyzing rocks, bagged or fully prepared samples with PC control and full reporting capability



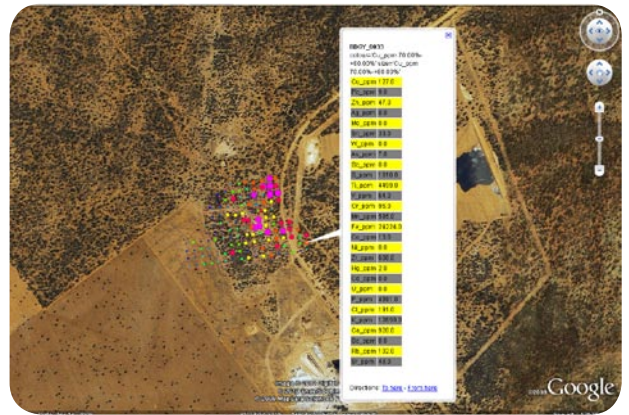
Handheld Screen Shot

The "XPLORER" GPS-GIS Package - For Live Geochemical Mapping

The Most Cost Effective Tool In the Box for Large Sites

Portable XRF allows for the generation of large, inexpensive geochemical data sets very quickly. The Xplorer provides important data management and validation framework, helping ensure the quality and integrity of your sampling program, while still in the field. Innov-X's XRF/GIS integration, the first of its kind in the industry, addresses the needs of the total project.

- » Field Portable XRF data is transferred wirelessly and spatially registered in real time using industry standard Mobile GIS & State of the Art, Trimble GPS Hardware (ArcPAD or Discover Mobile)
- » The result is live geochemical mapping in the field enabling visualization, gridding, and contouring in GIS, enabling rapid, informed decision making
- » Seamless integration into powerful geochemical analysis software such as io GAS for first class data validation and QA/QC
- » Reduces human error related to XRF data transfer, GPS coordinate merging and GIS integration



Google Earth Export



In-situ Soil Analysis with Soil Stick



Real-Time, Spatially Registered XRF Data

Element	Concentration	Element	Concentration
Ca	2945.441	Mo	952.455
V	266.285	Ti	398.824
Mn	10640.517	Pb	389703.192
Cu	344.987	Hg	15826.959
Cd	2690.969	Zn	49.649
Ag	-715.688	Rb	-1.141
Sr	-9.822	Zr	8.003
Nb	0	Mg	13051.442
Ap	28.050	Cd	-51.188
Sn	130.302	Sb	98.361
Ck	0	Ba	0
Hf	0	Ta	0
W	413.240	Hg	1592.228
Pb	357.066	Bi	731.725
Th	-245.231	U	179.964

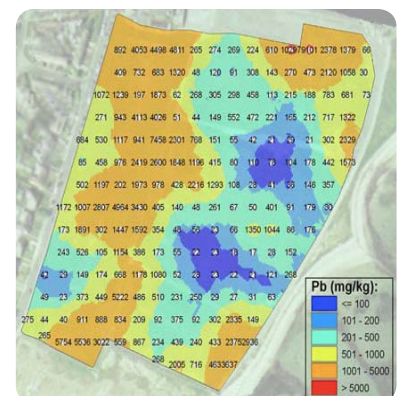
Live, Captured XRF Elemental Meta Data



Mobile GIS - Use All Your Layered Data in the Field

Metal Characterization Contour Mapping

Get the big picture with GPS-XRF. Get quick snapshots, instant visualization of data trends or analyze for comprehensive, defensible reports. From in-field rapid decision making to command-center monitoring, you get instant pinpoint location-specific sample chemistry or multidimensional metal content intensity plots. You can optimize sampling plans to reduce lab costs & reporting time for site assessments; delineate RCRA, heavy & priority pollutant metals; identify metal pollutant hot spots; screen cores to determine metal pollutant depth; track metal pollutant plume contours; establish contamination boundaries; and perform due diligence phase assessments, remediation & long-term monitoring.



INCORPORATING EVERYTHING YOU NEED in handheld XRF with state-of-the-art innovations and a brand new design – The DELTA Line from Innov-X.



4W x-ray tube, 200 uA current (max), plus optimized beam settings

Tight geometry for exceptional LODs and high analysis throughput

Large-Area SDD option plus customized x-ray tube provides exceptional light element sensitivity

Unique integrated vacuum technology (patent pending)

Patent-pending automatic barometric pressure correction adjusts calibration as needed

Lightning fast bootup & data acquisition:
Faster Testing, More Results

Floating Point Processor: more calculations in less time leverages more advanced calibration algorithms

Integrated Bluetooth for data input and output

Ergonomic rubberized handle for enhanced grip

Analysis indicator lights visible from 360°

Responsive, bright color touch screen display

Accelerometer technology puts unit to sleep when unused to conserve power, logs impacts for tool management

USB interface port for high speed data download and seamless PC control

Hot Swap: replace rechargeable battery without turning unit off or re-standardizing

Docking Station with Automatic Charging and Calibration Check



Additional Battery Charger

DC Outlet

Power and Battery Indicator Lights

Connect to a PC for Data Management

USB Connector Port

Comprehensive, Ruggedized High-Performance XRF in the Field

The DELTA Handheld XRF line meets EPA Method 6200 for metals in soil, NIOSH Method 7702 for lead in air filters, and OSHA Method ID-204 for lead in air filters and dust wipes. The 8 RCRA Metals and Priority Pollutant Metals are easily and quickly measured on site with the DELTA. Innov-X Portable XRF: used by Environmental & Consumer Protection Agencies, Offices of Energy and Transportation, Housing & Urban Development, Department of Agriculture, Food & Drug Regulators, Homeland Security & the Military.

Property Assessment

- » Immediately identify heavy metals in soil at low ppm levels
- » Real-time metal screening at construction or disposal sites – Pb, U, RCRA, Priority Pollutants
- » Real Estate Transaction Due Diligence for RCRA & Priority Pollutant Metals
- » Brownfields Phase I/II/III
- » Lead (Pb) clearance failure avoidance: on-site dust-wipes
- » Tube-based Pb Paint Analysis



Non-Destructive Consumer Safety Testing

- » Toxic additives in paints, coatings, & plastics: Cd, Cr, Br, Sb
- » PCB's indicator in household material: Cl, Br
- » Defective drywall indicator: Sr, S
- » Mercury (Hg) Contamination
- » CCA-treated wood products: Cr, As & Cu
- » Heavy metal pesticides (Pb, As) in food sources
- » Toxic metals in children's toys, trinkets & jewelry: Pb, As, Cd, Hg



Industrial Hygiene Monitoring

- » NIOSH Method 7702 and OSHA Methods OSA1 & OSS1 Compliance
- » Environmental & health impact on workers of industrial processes
- » Airborne metals in mining, welding, construction, fabrication, maintenance and repair, paint removal and renovation



Hazardous Waste Screening

- » Debris for hazardous or non-hazardous disposal in lieu of TCLP testing
- » HAZMAT & AML sites: wire burns, waste dumps, shooting ranges
- » Extreme weather debris migration
- » Construction or demolition project waste
- » Waste streams and oil pools
- » Industrial and mining process community perimeters



US EPA Method 6200: Field Portable XRF to Determine Elemental Concentrations in Soil and Sediment

- » Improves data quality
- » Offers cost-effectiveness of more and better field testing
- » Offers analytical benefits of more and better field testing
- » Improves site understanding in real-time
- » Decreases sampling effort by increasing number and quality of samples tested
- » Requires Calibration Verification
- » Requires Instrument Precision, Accuracy and LOD Verification
- » Recommends confirmation of 5-10% of samples with lab ICP
- » Accepts testing method for IN-SITU, BAGGED & FULLY PREPPED SAMPLES

"...the analysis of multiple elements is substantially less expensive using XRF technology ... XRF technology can easily provide rapid turnaround data in the field to aid in field decision-making and more cost-effective environmental cleanup." : EPA/540/R-06/002; Innovative Technology Verification Report: XRF Technologies for Measuring Trace Elements in Soil and Sediment