Geo & Hydro – K8 Ltd

Excellence in Environmental Engineering

Survey using the XRF analyser

Rapid, Inexpensive and Extensive

- **Rapid** — the XRF analyser can detect the presence and concentration of heavy metal contamination (in particular lead and arsenic for sheep dips) in 20s, equivalent to 400 tests a day.
- **Inexpensive** — with an experienced operator many more samples can be analysed *in-situ* without the reliance on expensive and time consuming lab analysis (at only 10% of the cost!)
- **Extensive** — since contamination can extend well beyond the initial area identified, with an XRF analyser one can delineate accurately the extent of contamination within hours.

"the XRF analyser can greatly reduce sampling and analysis costs for indicating the extent of contamination." Ministry for the Environment., MfE[1]

Providing solutions and services for:

- Councils
- Consultants
- Planners and Engineers

Drs. Ben Keet, Contaminated Land Auditor.
"Ben is probably New Zealand's most experienced contaminated land practitioner"
Howard Ellis, Sr. Advisor MfE

You can contact Ben on: 021 117 1148
or send your queries to ben@benkeet.com
For background info: www.benkeet.com

Source: JE Duncan[2]

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Using the XRF analyser - What support do we offer you?

Depending on your needs and the level of expertise within your organization, Geo & Hydro - K8 Ltd has devised a flexible and cost effective approach that can give you whatever support you require;

Option 1	Training	The XRF analyser daily or weekly hire with ½ day training by a licensed operator at a site of your choice
Option 2	Technician	The XRF analyser daily or weekly hire with a full time technician
Option 3	Expert	The XRF analyser daily or weekly hire with a contaminated land expert (Drs. Ben Keet with 20 years of experience in contaminated land projects worldwide)

The versatility of the XRF analyser?

The XRF analyser can greatly reduce site assessment costs by analysing for heavy metal contamination in many different situations. Here are just a few of the different locations where the XRF has recently been used;

Subdivisions of horticultural land, farm tips, wool sheds, shearing quarters, orchards, glass houses, spray sheds, lead paint on and around older houses, contaminated lake bottoms and stream beds, metal workshops, electroplating or powder coatings, garages, timber treatment yards, storage of CCA timber, fence line assessment, brickworks with glazing activities, porcelain and paint factories and battery manufacturers.

What are the advantages of using an XRF e.g. sheep dips?

Arsenic is the main contaminant found near old sheep-dip sites. Often the location of the old dips are poorly known but using an XRF analyser a wide suspect area can be searched rapidly, carrying out up to 400 soil analysis on a single day and surveying 2 - 6 acre sites become a reality. GPS coordinates can be recorded with the analysis data, so quality records are available for future use. Arsenic analysis is done on the spot in 20 seconds: iterative sampling designs becomes a reality, without the need for a follow-up survey. Thus any apparent 'hot spots' can be fully investigated during a single site visit. Large areas can be cleared as not contaminated in a minimum of time.

Drs. Ben Keet

Drs Keet has managed hundreds of environmental site assessment projects in over 10 countries since 1987. He has been responsible for the assessment of oil terminals in all ports of New Zealand, investigated timber treatment yards, gasworks, service stations, meat factories, orchards, sheep-dips, farms and subdivisions in New Zealand. He managed the remediation of a major kerosene spill at Sydney Airport and was director of the environmental audit team during the handover of Luxembourg airport

He has trained many remediation engineers in Europe, held workshops for the United Nations and contributed since 2003 to WasteMINZ's annual conference. He is an Accredited Contaminated Land Auditor and was an editor for MfE sheep dip guidelines. [1]

[1] = http://www.mfe.govt.nz/publications/hazardous/risks-former-sheep-dip-sites-nov06/html/page1.html
[2] = JE Duncan, Practical Points of Sheep Dipping, Bulletin No. 181, Dept of Agriculture. Courtesy of the National Library of NZ

For more information about the field portable XRF analyser:

- The advantages and detection limits of portable XRF analysers:

http://www.innovx.com/technology/portable?utm_campaign=xrf&gclid=CIeZl_PfkZYCFSQWiQodK1ksFQ

- Ministry for the Environment (NZ) writes: One of the technologies currently best suited for on-site field assessments of historically contaminated sheep dips in New Zealand is X-ray fluorescence (XRF).

http://www.mfe.govt.nz/publications/hazardous/risks-former-sheep-dip-sites-nov06/html/page17.html

- Ministry for the Environment (NZ) recommends the use of field portable XRF analysers also in Guideline no. 5:

http://www.mfe.govt.nz/publications/hazardous/contaminated-land-mgmt-guidelines-no5/html/page5.html

- And indicated in the Gasworks guideline: A semi-quantitative XRF scan can determine the concentrations of 57 (mostly metallic) elements from levels of 100% to a minimum detectable level of 0.001% (10mg/kg)... See page 3-6 in:

http://www.mfe.govt.nz/publications/hazardous/gas-guide-aug97/gas-3-aug97.pdf

- Frequently asked questions answered by the US EPA

http://www.epa.gov/superfund/health/contaminants/lead/products/xrffaqs.pdf

- The magazine Pollution Engineering provides objective information:

http://www.pollutionengineering.com/CDA/Articles/Case_Studies/73c332cc71e68010VgnVCM100000f932a8c0____

- From the book Contaminated Land Chapter 3: Cost-effective Investigation. within Sampling Constraints:

http://www.rsc.org/ebooks/archive/free/BK9780854045525/BK9780854045525-FP007.pdf

- XRF Marks the Spot – The benefits of X-ray fluorescence are helping change the way people look at brownfield remediation:

http://www.eponline.com/articles/53986/