



Excellence through measurement

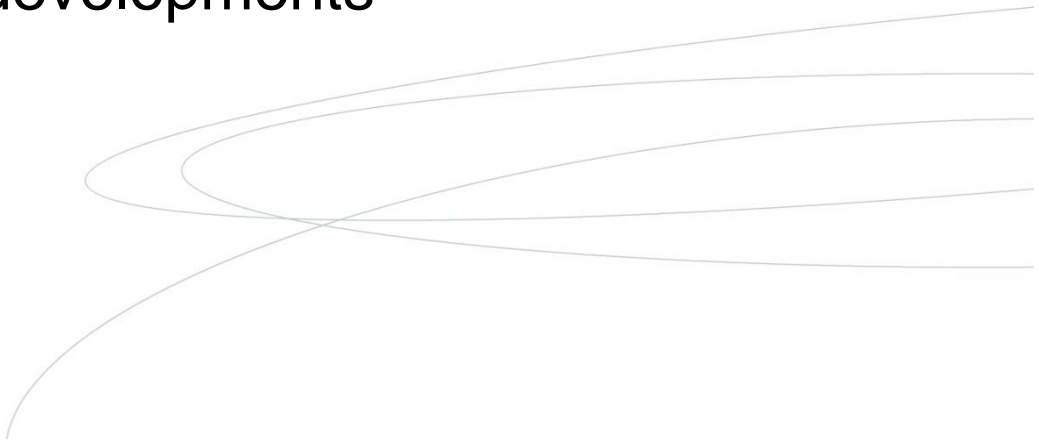


Environmental Day 2011: LGC Standards, Proficiency Testing

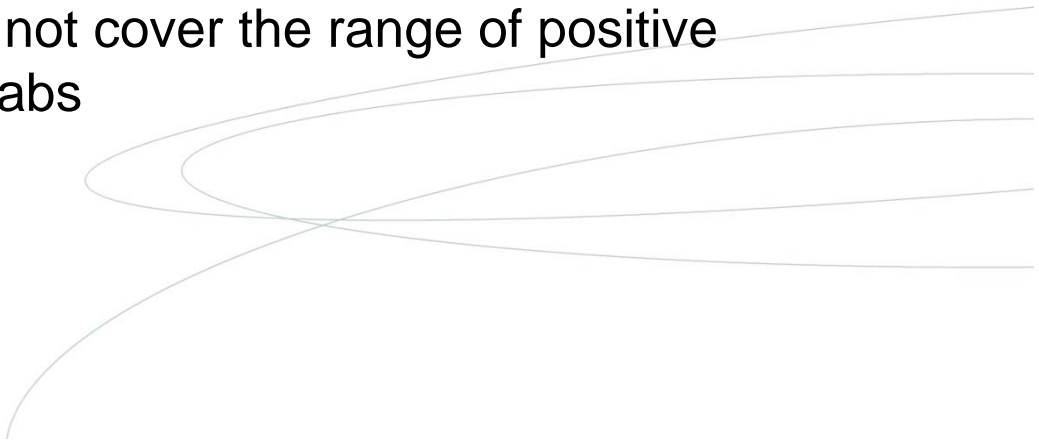
CONTEST PT scheme review

Matthew Whetton

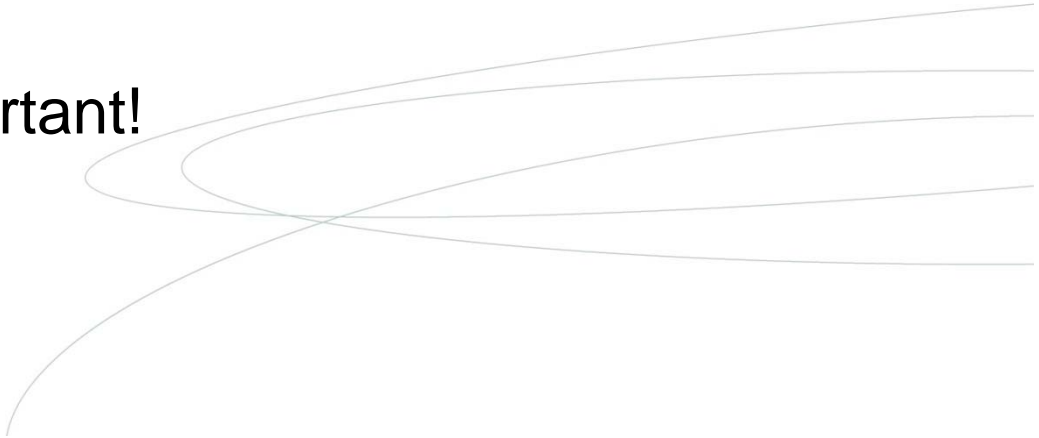
CONTEST: Introduction

- CONTEST WAC Leachate sample
 - Participant survey
 - Results of round 77 2011
 - Future rounds & developments
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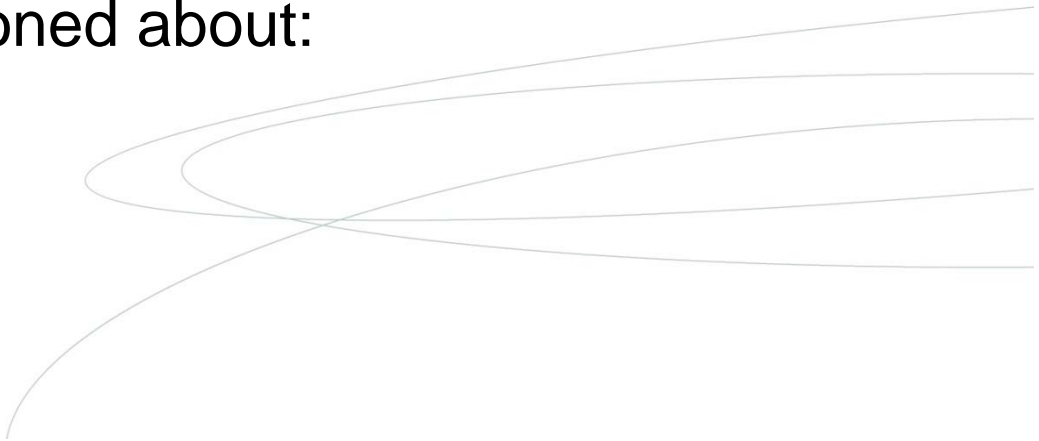
CONTEST development (1) 2010

- CONTEST C18 (Leaching sample)
 - WAC analysis
 - Specific list of analytes
 - Defined acceptance criteria
 - 10:1 liquid:solid ratio
 - Other analysis
 - Other liquid:solid ratios required (e.g. 2:1)
 - C18 contains a large number of analytes
 - Current samples may not cover the range of positive samples received by labs
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CONTEST development (2) 2010

- The key points to be addressed
 - How to produce samples with more ‘numerical’ results?
 - How to make the sample relevant to more labs?
 - A questionnaire will be sent out
 - Listing possible scheme structures
 - Identifying leaching methods
 - Identifying key the analytes
 - The most appropriate format will be taken forward
 - Your opinions are important!
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CONTEST WAC Leachate

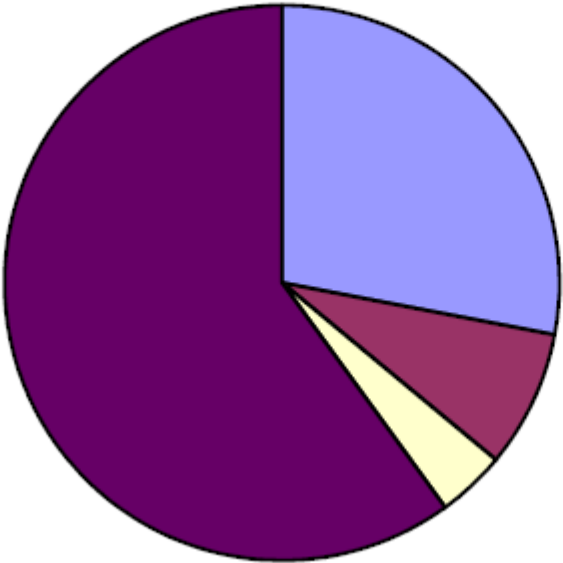
- Proposal
 - A sample which meets the needs of labs analysing test materials according to the Waste Acceptance Criteria
 - Participant Survey
 - Sent to all CONTEST participants
 - Approx. 50% return rate
 - Participants questioned about:
 - Frequency
 - Analytes
 - Methods
- 

CONTEST Leachate survey



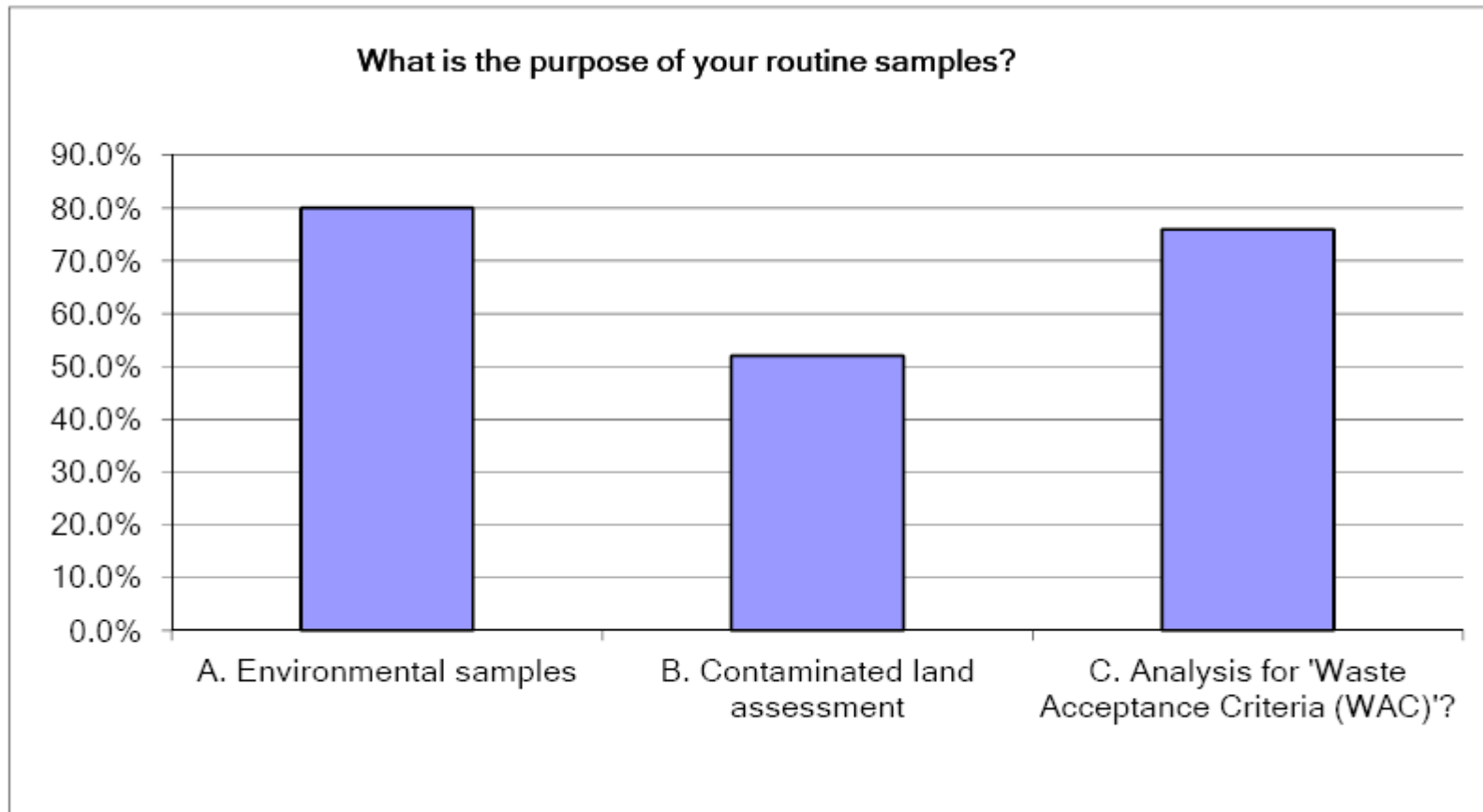
Excellence through measurement

How frequently do you participate in this sample? (per scheme year)



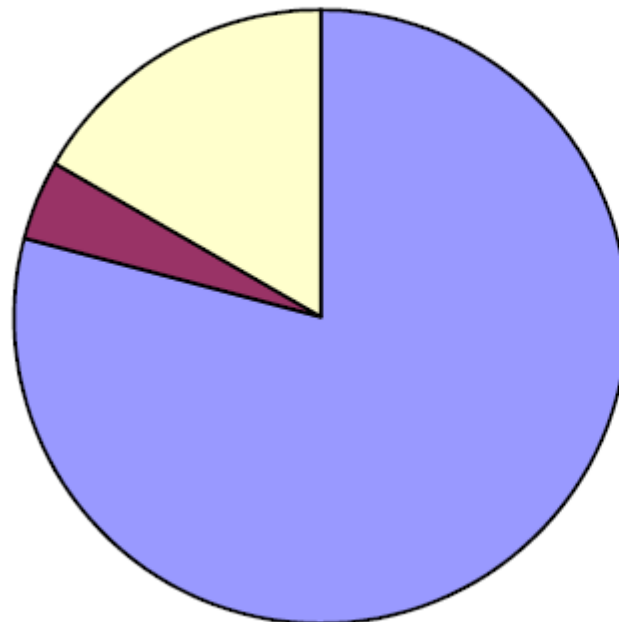
- A. Once
- B. Twice
- C. Three times
- D. Four times
- E. Every time

CONTEST Leachate survey

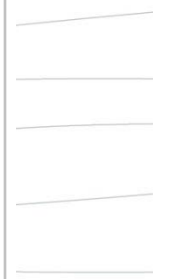


CONTEST Leachate survey

What solvent:solid ratio do you apply?



- A. 10:1
- B. 2:1
- C. Other (please specify)

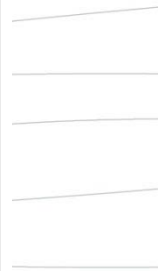
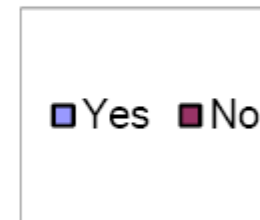
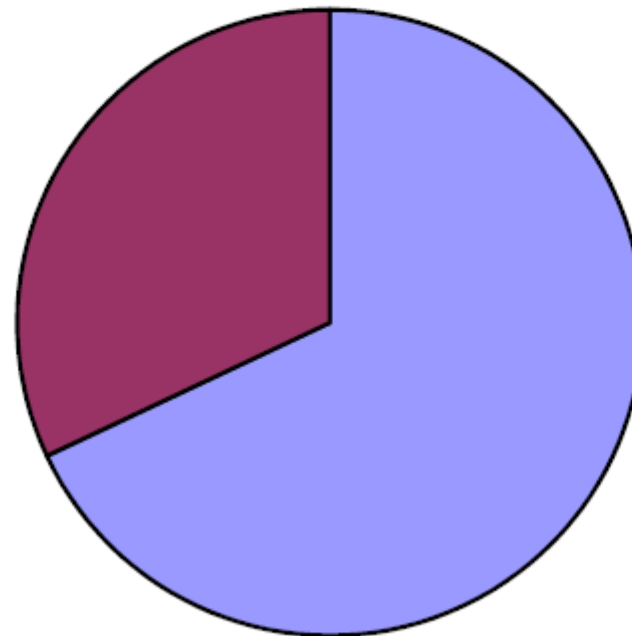


CONTEST Leachate survey



Excellence through measurement

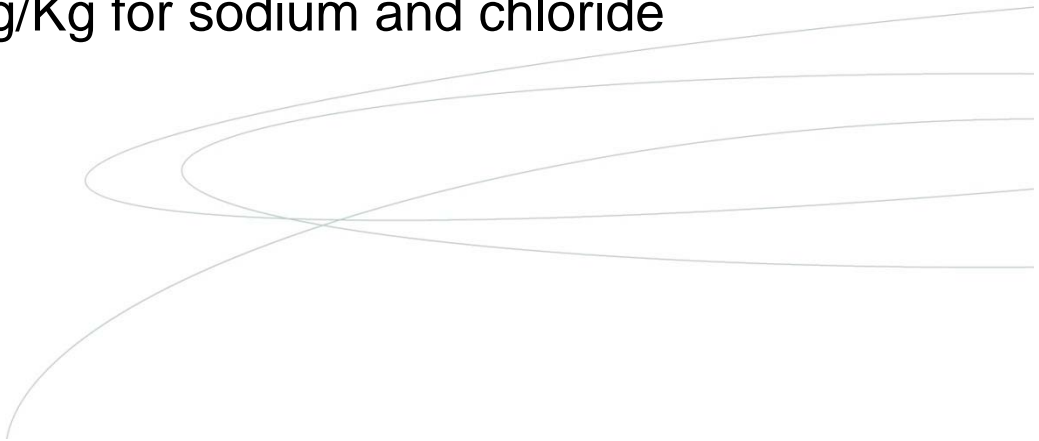
Do you use a standard method for the analysis of leachate samples?



CONTEST WAC Leachate

- Three rounds of WAC leachate sample (E)
- Structure
 - Single sample, approx 200g.
 - Analysis using EN 12457
 - 10:1 solvent:solid ratio, results reported in mg/Kg
 - WAC analytes
 - Wide range of test materials (sludge, fly ash etc.)
 - AV = Robust mean
 - SDPA = Robust standard deviation

CONTEST WAC Leachate

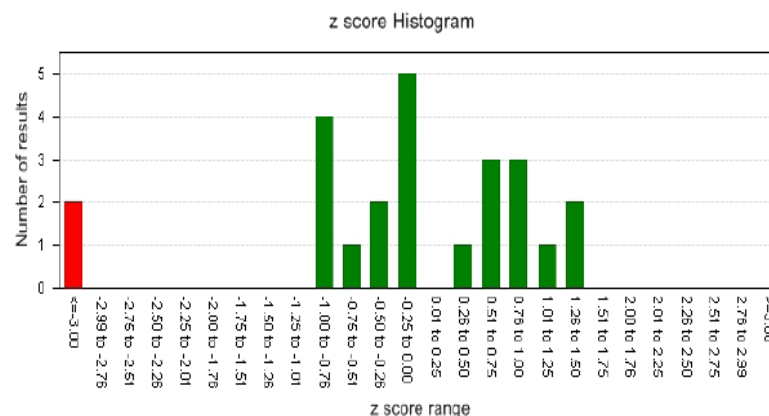
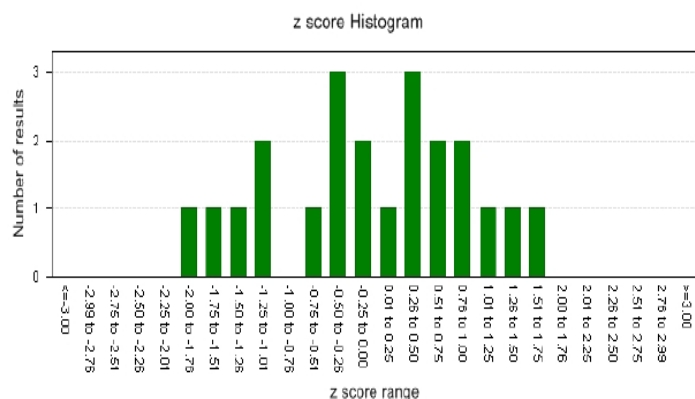
- Round 77 was an APC residue with high levels of contamination.
 - The results were as ‘expected’
 - 13 of the 19 analytes received colour coding
 - Analyte concentrations ranged from:
 - 0.007 mg/Kg for mercury to
 - 296 mg/Kg for Lead and
 - 23,500 and 169,500 mg/Kg for sodium and chloride
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CONTEST WAC Leachate



Excellence through measurement

- The good, barium, SO₄, molybdenum, zinc.....



Performance Statistics

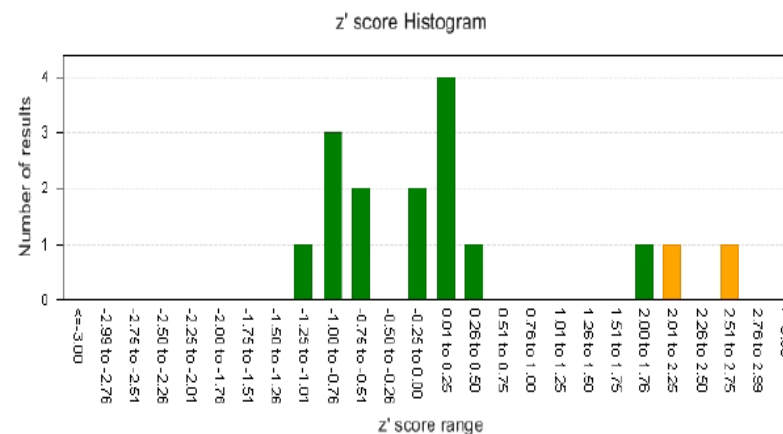
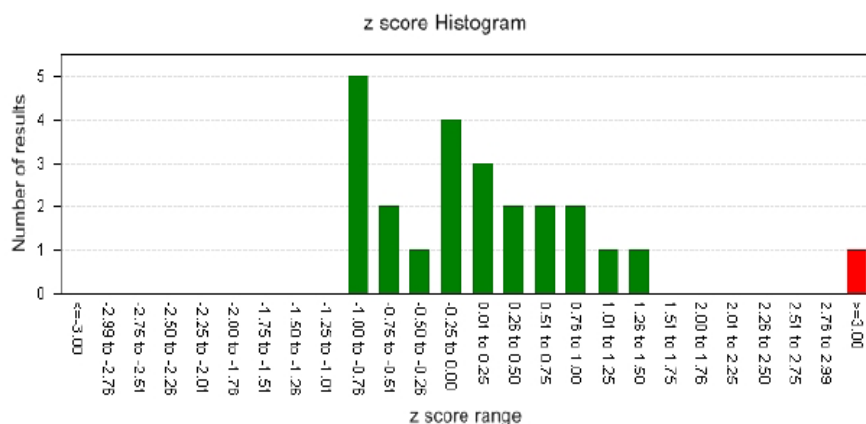
	Value
Assigned Value	61.8 mg/kg
Uncertainty of Assigned Value	7.9 mg/kg
SDPA	29.6 mg/kg
Satisfactory Range	2.6 to 121.0 mg/kg
Satisfactory z scores	100.0%
Questionable z scores	0.0%
Unsatisfactory z scores	0.0%

Performance Statistics

	Value
Assigned Value	13,300 mgSO ₄ /kg
Uncertainty of Assigned Value	348 mgSO ₄ /kg
SDPA	1,330 mgSO ₄ /kg
Satisfactory Range	10,640 to 15,960 mgSO ₄ /kg
Satisfactory z scores	91.7%
Questionable z scores	0.0%
Unsatisfactory z scores	8.3%

CONTEST WAC Leachate

- The bad, lead, copper.....



Performance Statistics

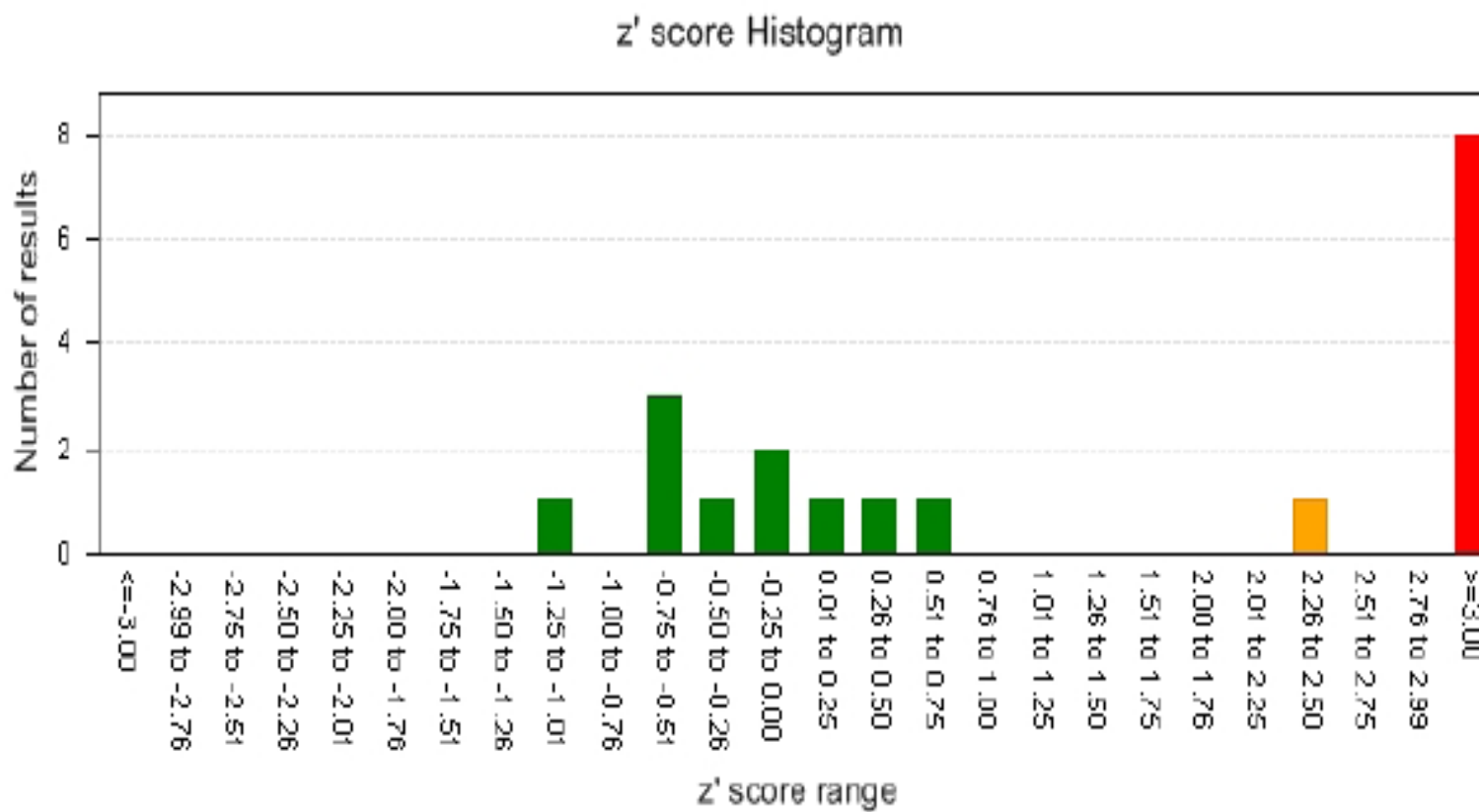
	Value
Assigned Value	296.0 mg/kg
Uncertainty of Assigned Value	77.3 mg/kg
SDPA	296.6 mg/kg
Satisfactory Range	>0 to 889.2 mg/kg
Satisfactory z scores	95.8%
Questionable z scores	0.0%
Unsatisfactory z scores	4.2%

Performance Statistics

	Value
Assigned Value	0.319 mg/kg
Uncertainty of Assigned Value	0.082 mg/kg
SDPA	0.262 mg/kg
Satisfactory Range	>0 to 0.843 mg/kg
Satisfactory z' scores	87.5%
Questionable z' scores	12.5%
Unsatisfactory z' scores	0.0%

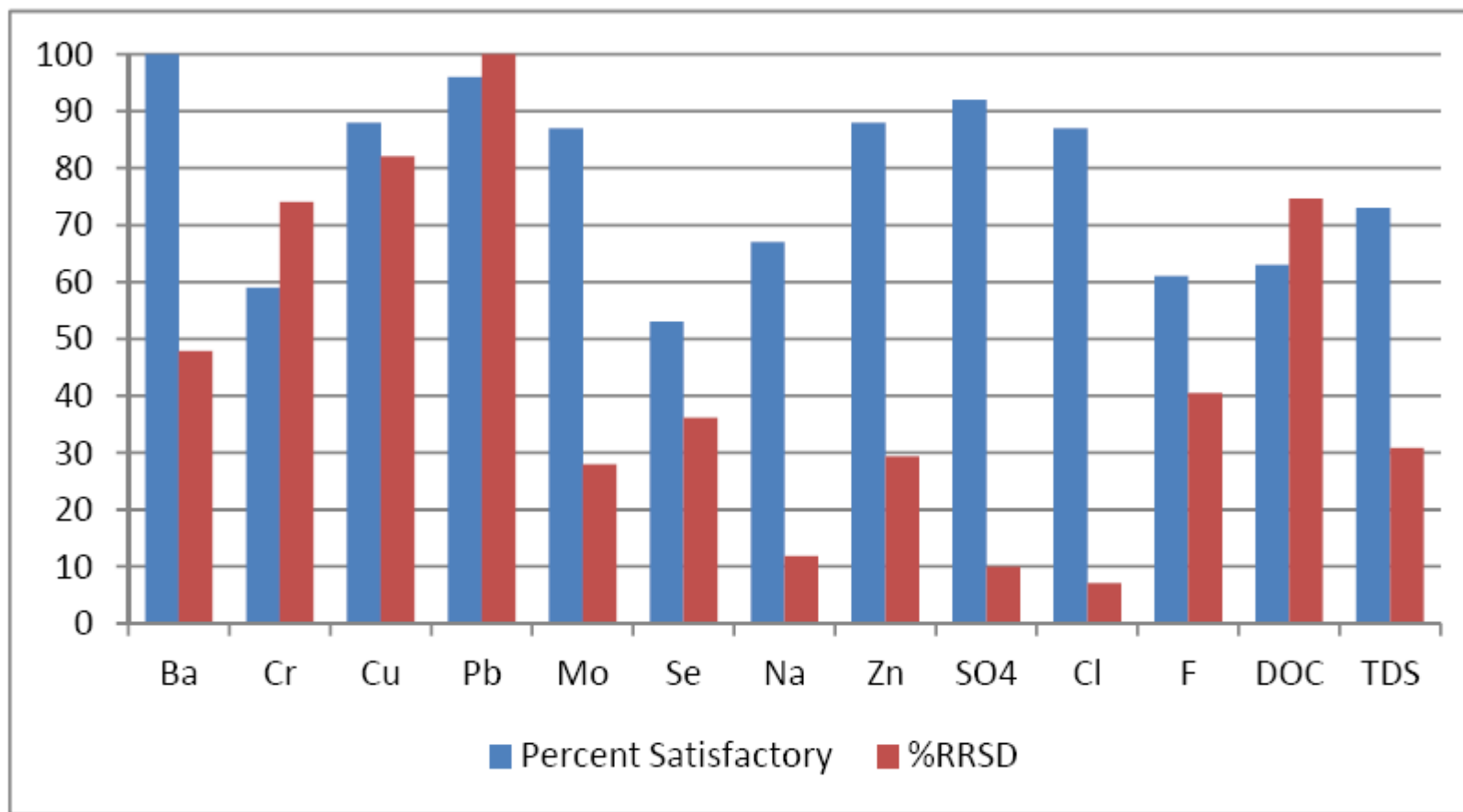
CONTEST WAC Leachate

- The ugly, selenium.....



CONTEST WAC Leachate

- Percentage satisfactory and spread of results



Round 77: Summary

- The results were very variable, as most in the field had suspected they would be.
- The problem may not be with the labs per se.
- Since , the EN standards indicated this level of variability, when the validation work was carried out.
- In which case it seems a bit like saying the speed limit is 30 mph, but the test methodology has a margin of error of 30 mph!

Sample E: Next steps

- Second round (CONTEST 79)
- Sludge sample
- Not completely dried
- Moisture (%) determined at LGC
- Leaching conditions prescribed
 - 169g of solid, 817ml of water
- Equation for calculation provided
 - $A = C \cdot ((0.817/0.09) + (92.26/100))$
 - Where A = conc in mg/kg dry matter (this must be reported as the result)
 - Where C = conc in the eluate (in mg/l)

Round 79 closes on Friday!



Any questions!