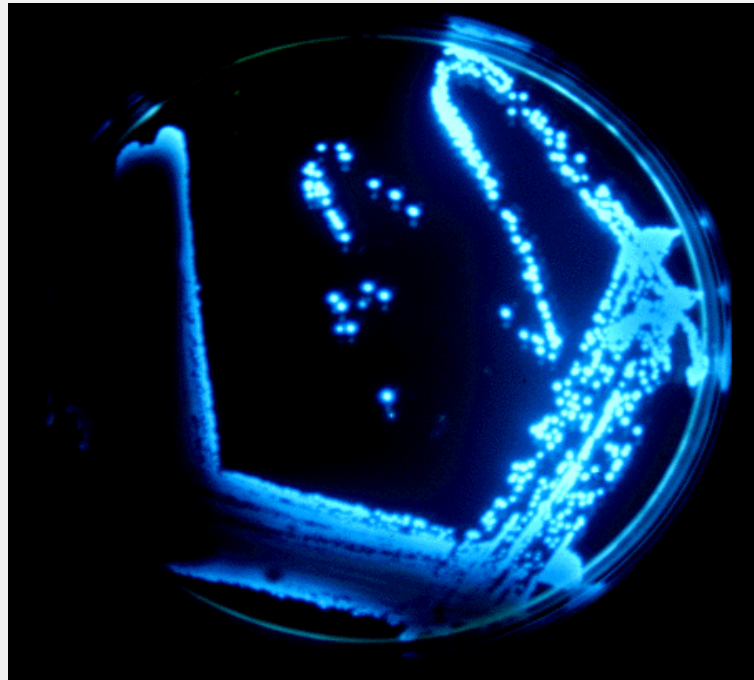


# Safe Soil Tester™

An Innovative UK Technology For On-Site Detection Of PAHs In Soil.  
3 Case Studies



Luminescent Bacteria “*Vibrio fischeri*” used as the biosensor in the Safe Soil Tester™

Presented 18/10/2013

ESAA: Remediation Technologies Symposium 2013, Banff, Alberta  
By E.J. Bell, Qanari Inc. Canada (formerly Crown Bio UK)

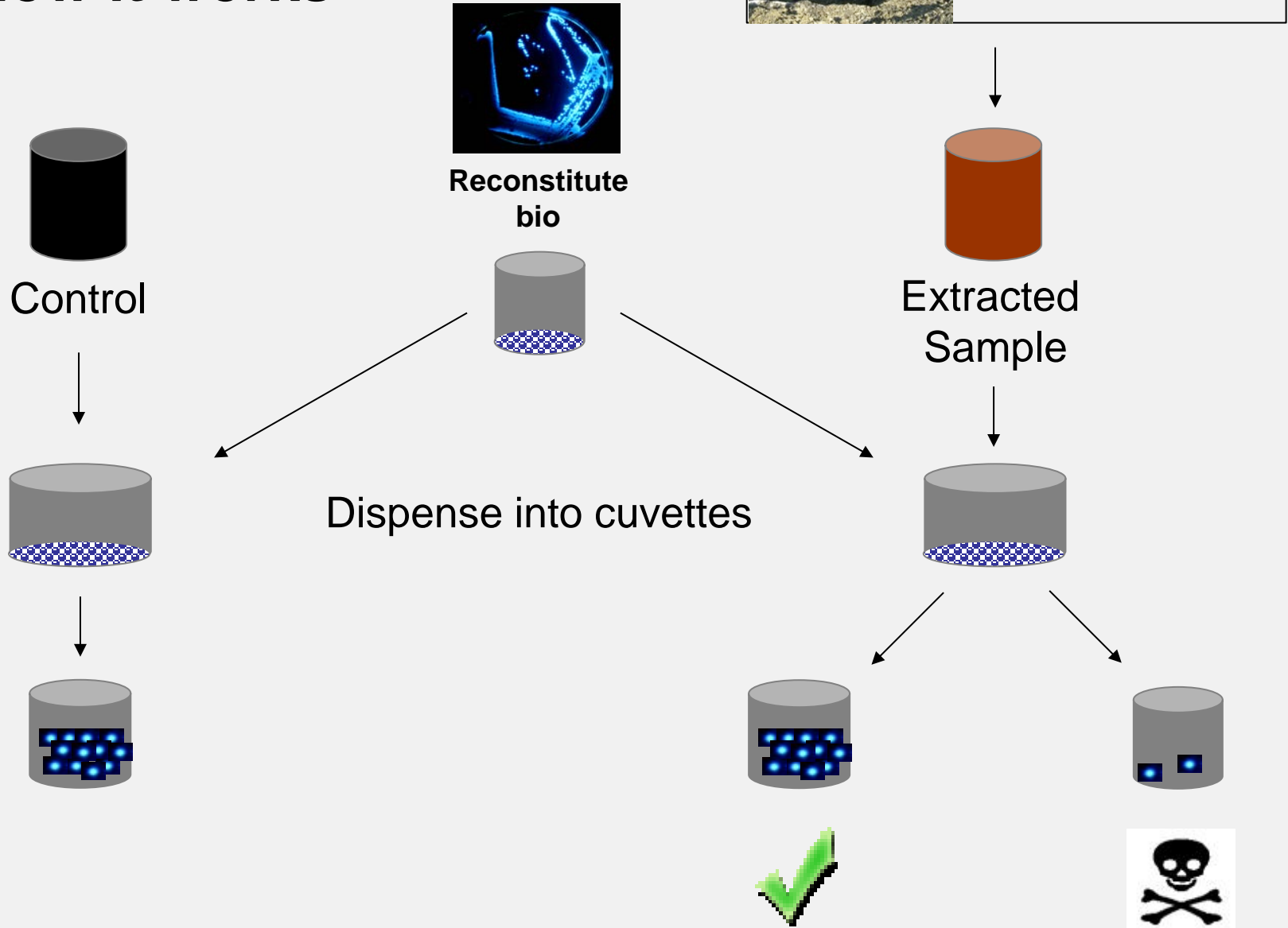
# Unique UK Biosensor Technology

- ◆ Screen for carcinogenic contaminants such as PAH's (Polycyclic Aromatic Hydrocarbons) in soil, drilling muds, sediment, etc.
- ◆ Easy to use, portable & quick
- ◆ Non invasive, GPS-enabled
- ◆ Economical
- ◆ Data can be transferred to digital apps
- ◆ Data used for Toxicity mapping
- ◆ Validated under EU ETV (Environment Technology Verification) scheme – 2009 – similar to the USA/Canada ETV program

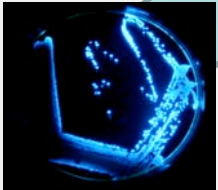


Safe Soil Tester™ and test kits  
(Recyclable packaging)

# How it works



# PAH Toxicity 'Chain'

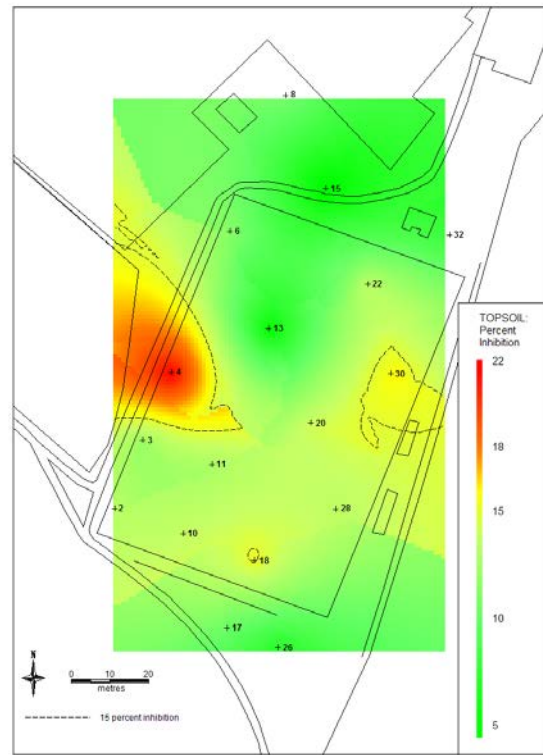


'What kills the *Vibrio fischeri* may eventually harm you!'

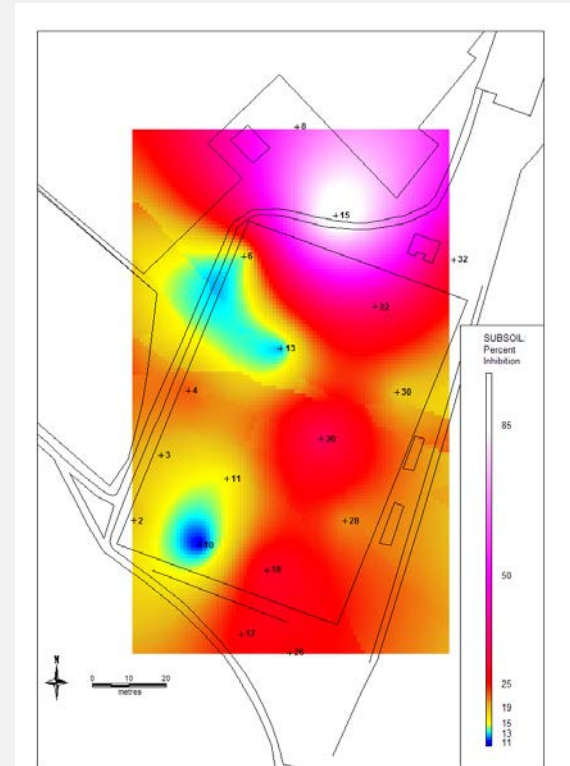
# Case Study 1: Soccer field in the West of England



Google map view



SST™ Results on surface



SST™ Results from  
sub-surface/ 1 metre

## Case Study 2

### Construction training site for London Olympics 2012 Docklands, London, UK

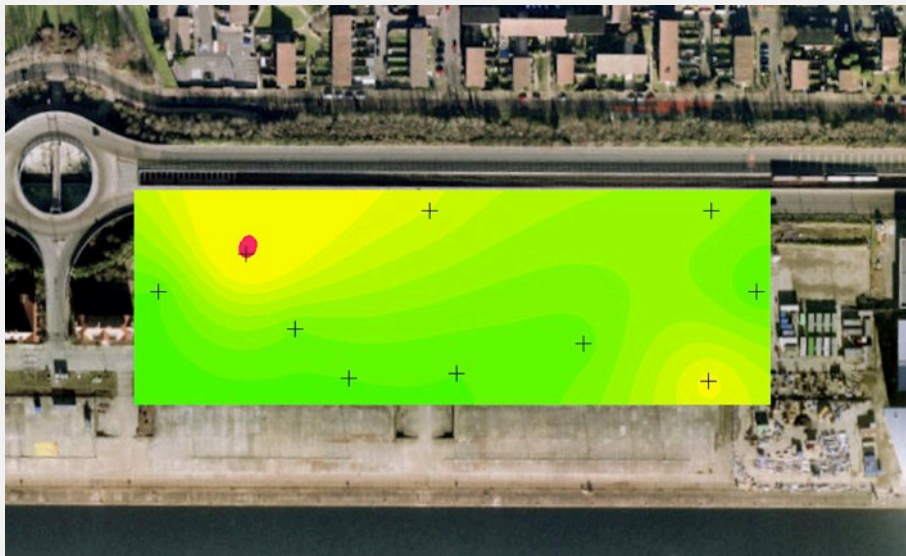
Toxicity soil screening (Feb 2009)  
for LDA/ODA, for an Equipment  
Operators Training Facility  
(soil handling and movement)  
at former London Royal Docks  
site.



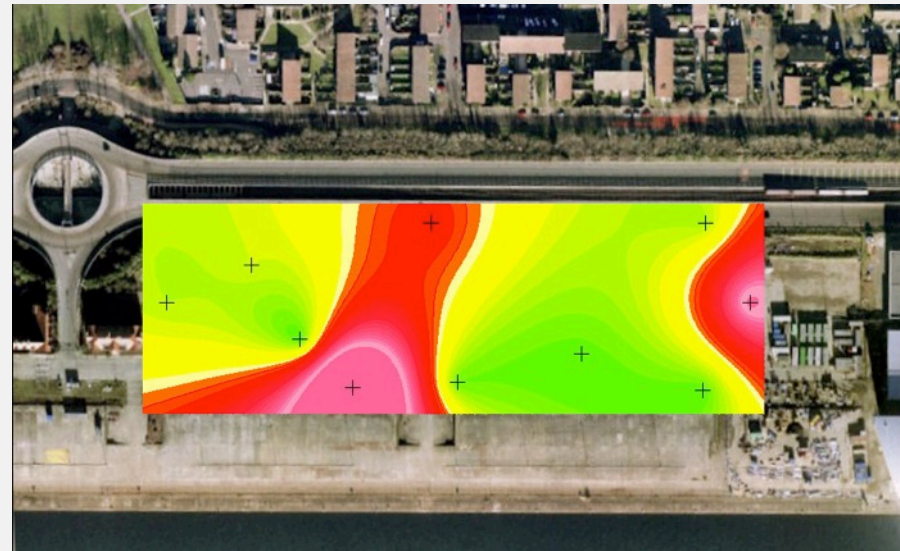
The screening identified 'hot-spots'  
as well as an existing trend of  
contamination alongside  
the River Thames.



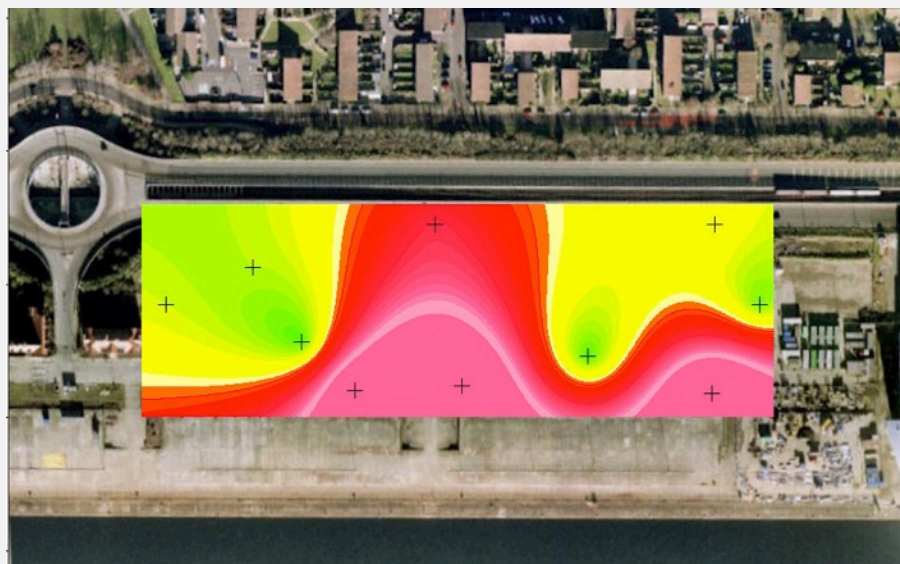
# Results: Toxicity Maps produced from data obtained with the SS Tester™ in 4 days



0.5m Depth



1.0 m Depth



2.0 m Depth

# Case Study 3

## Public Housing, Littleport, Cambridgeshire, UK

Garden tested with SST™ – Nov 2005  
(‘Tonight with Sir Trevor McDonald’ –  
ITV)



Excavation of contaminated  
soil underway - 2008



An example of how this fast  
screening bio-sensing technology  
quickly detected  
PAH contamination,  
helping the residents  
finally get justice



Clean soil in place  
July 2008



## Case Study 3 cont. Public Housing, Littleport, Cambridgeshire, UK



Testing the replaced soil for householders, providing certification, restoring “blighted” property value.



# Case Study 3 cont.

## Public Housing, Littleport, Cambridgeshire, UK



### Certificate of Soil Cleanliness<sup>®</sup>

This certificate confirms that Plot 13 on  
16 Old School Close, Cambridge – CB6 1ET  
has been screened for

#### Poly Aromatic Hydrocarbons (PAH's)

Using the SS TESTER™ three samples were taken and tested on the surface and one at a depth of half a meter in accordance with Crown Biotechnology Ltd standard soil testing procedures. One sample sent to the National Laboratory Service (EA) for Chemical Verification.

Soil samples were screened from 4 locations as identified on the attached plan.

Sample Reference	Depth	Status
L1	Surface	Passed
L2	Surface	Passed
L3	Surface	Passed
L4ss	0.5m	Passed

This certificate is in accordance with current UK & EU contamination acceptance levels.

Inspector: \_\_\_\_\_

*Crown Bio Technology Ltd*

Date: \_\_\_\_\_

National  
Laboratory  
Service



A follow-up toxicity test showed the soil was clean and the results were verified by the National Laboratory Service (EA)



# Summary

- The Safe Soil Tester™ was developed in the UK to provide a low-cost site testing regime. It uses a biosensor (*vibrio fischeri*) to test the toxicity of soil, sediment or drilling mud waste.
- It is easy to use, and data can be output to mapping software or digital apps.
- It can be used for anything, from residential property, to the evaluation of brownfield contamination on industrial sites, and even pesticides in agricultural land.
- It can be used to establish baseline surveys for large industrial projects. E.g. Oil & Gas plants, pipelines, electric facilities, etc. Importantly, in light of recent events, it could be used in Alberta for flood mitigation, minimizing the scraping residues needed and to avoid dumping clean soil.
- Qanari Inc is a new Canadian company established in Quebec to distribute and support the Safe Soil Tester™ across Canada and the USA.

# Contact

## **Qanari Inc.**

Montreal, Qc, Canada  
ejbell@qanari.com  
www.qanari.com



## **Wilton Biotechnologies**

Porton Down, Wiltshire, UK  
info@wiltonbiotechnologies.com  
www.wiltonbiotechnologies.com

