USE OF PERSONAL PID DEVICES TO SUPPLEMENT HYDROCARBON MONITORING USING CHARCOAL MEDIA

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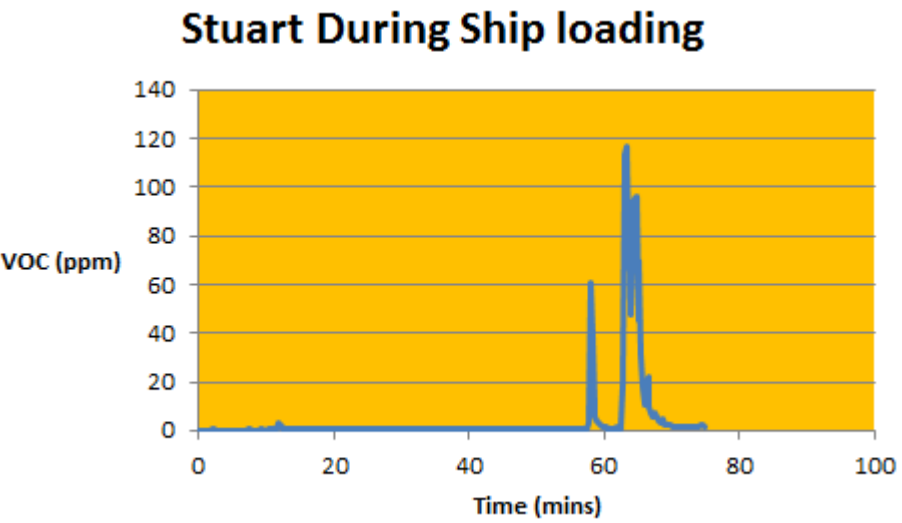
PERSONAL PID MONITORS

- Photoionisation Detectors (PID)
- Direct reading total VOC monitors
- Can also apply correction factor
- Small devices available can be attached to a worker
- Provides useful real-time data
- Supplement data from charcoal media

BENEFITS OF PORTABLE PID MONITORS

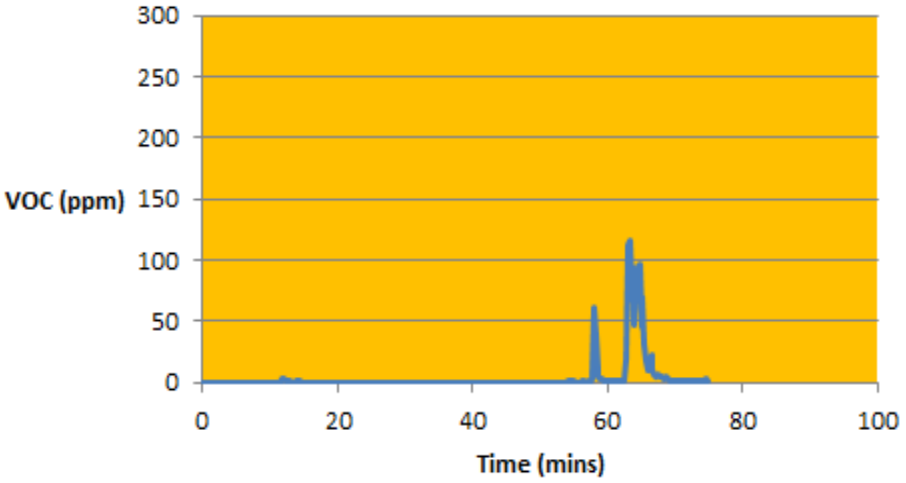
- Can easily place within the breathing zone of the operator for the duration of the task (unlike use of a hand held ‘sniffer-type’ device).
- Identify periods where there is exposure and no exposure during the task(s) assessed
- Confirm assumptions about the principle contributors of exposure in order that control measures can be targeted.
- Show operators how exposure occurs which may encourage them to consider how they can help reduce exposure. This should also help with operator engagement with the monitoring process.
- Act as a monitor and alarm where there is a risk from high toxic vapour levels

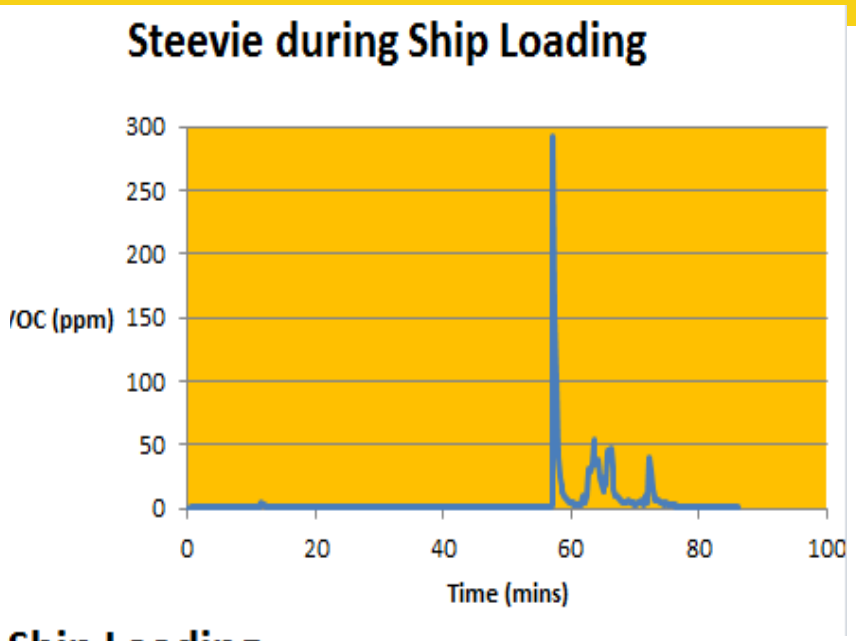
LOADING SHIP WITH GAS CONDENSATE

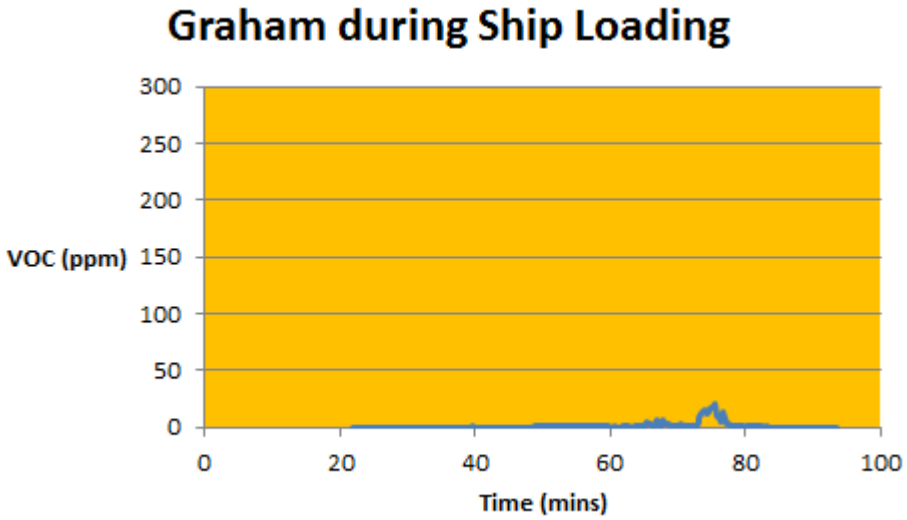


UNLOADING GAS CONDENSATE

(Stuart & Stevie 15 minute 1.4ppm benzene; 27ppm VOC with pumped sample, PID average 22ppm)

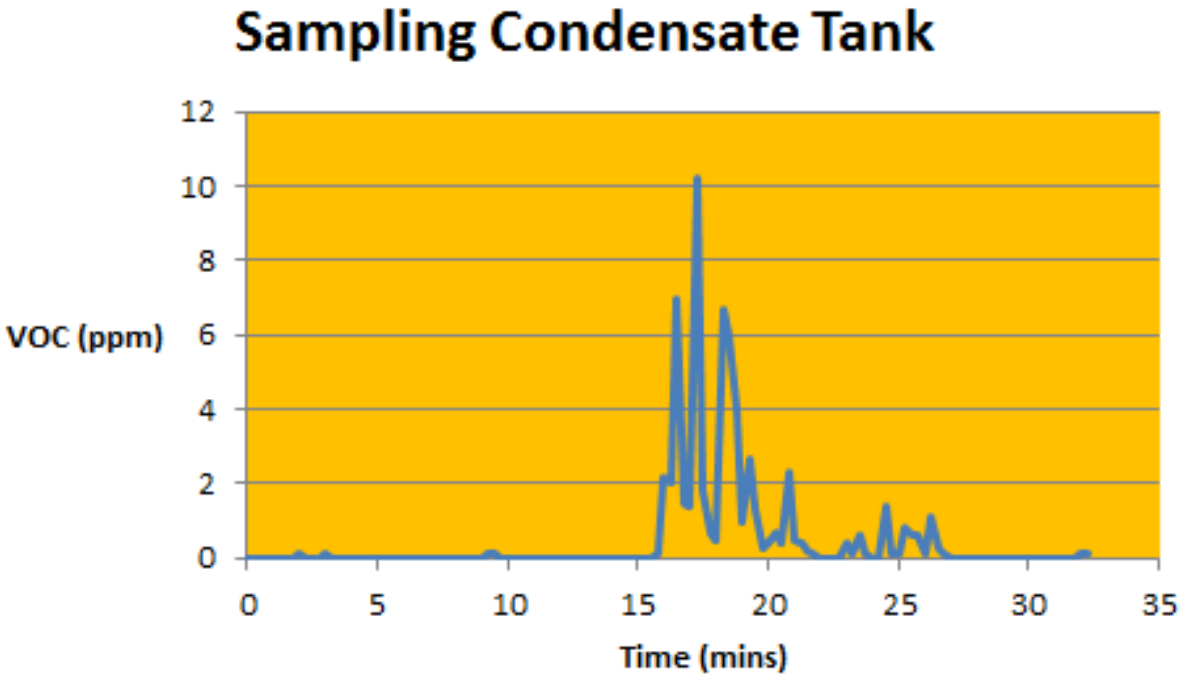






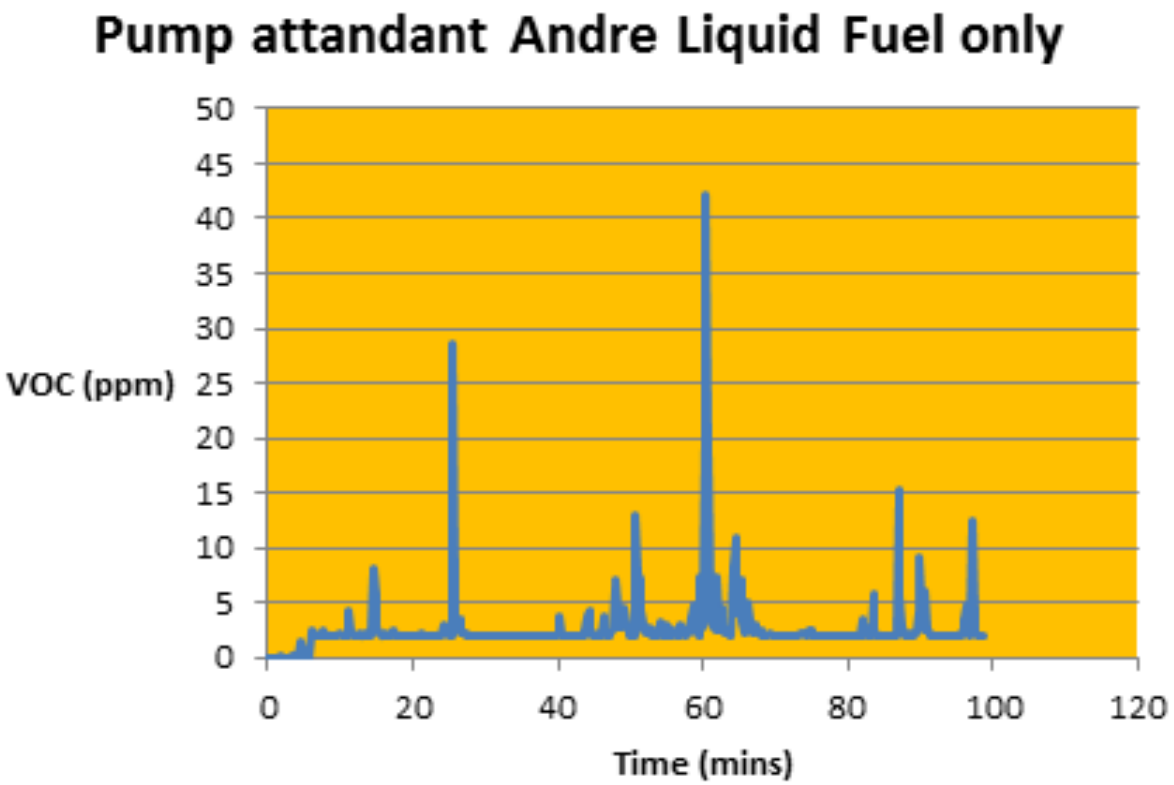
LAB STAFF ROUTINE SAMPLING

(15 minute 0.33ppm benzene, 3.5ppm VOC (PID 1.3ppm, under read)



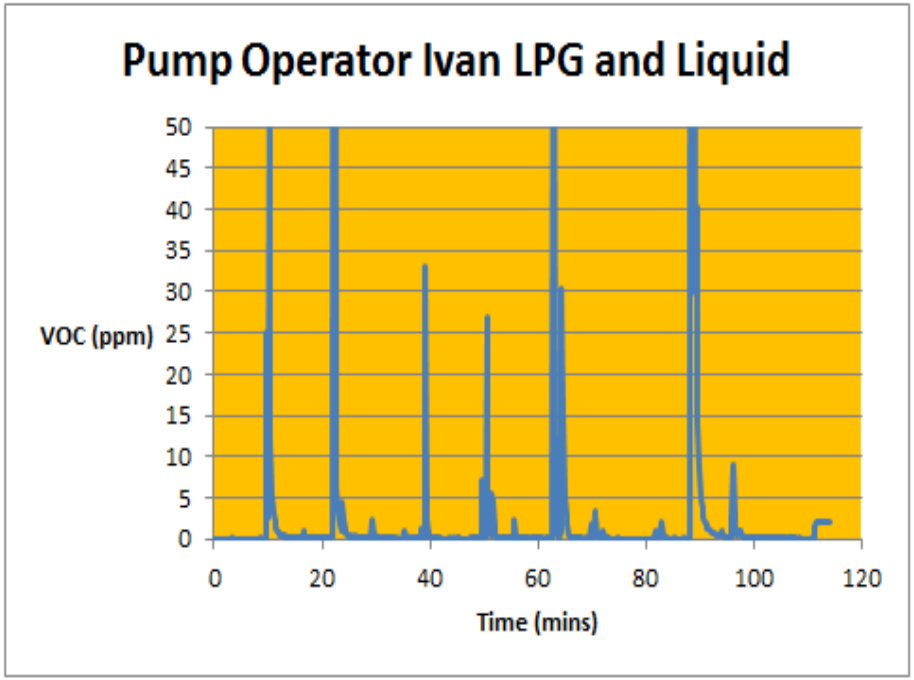
ATTENDED SERVICE STATIONS

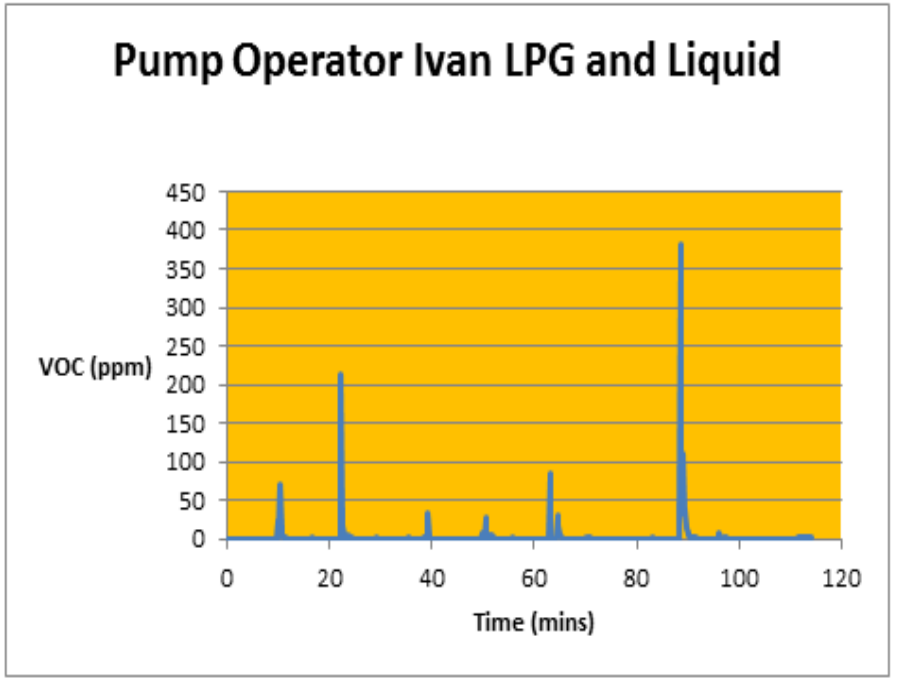
(VOCs not detectable with 3M passive badge. PID measured 2.7ppm VOC)



ATTENDANT WITH MIX OF FUELLINGS

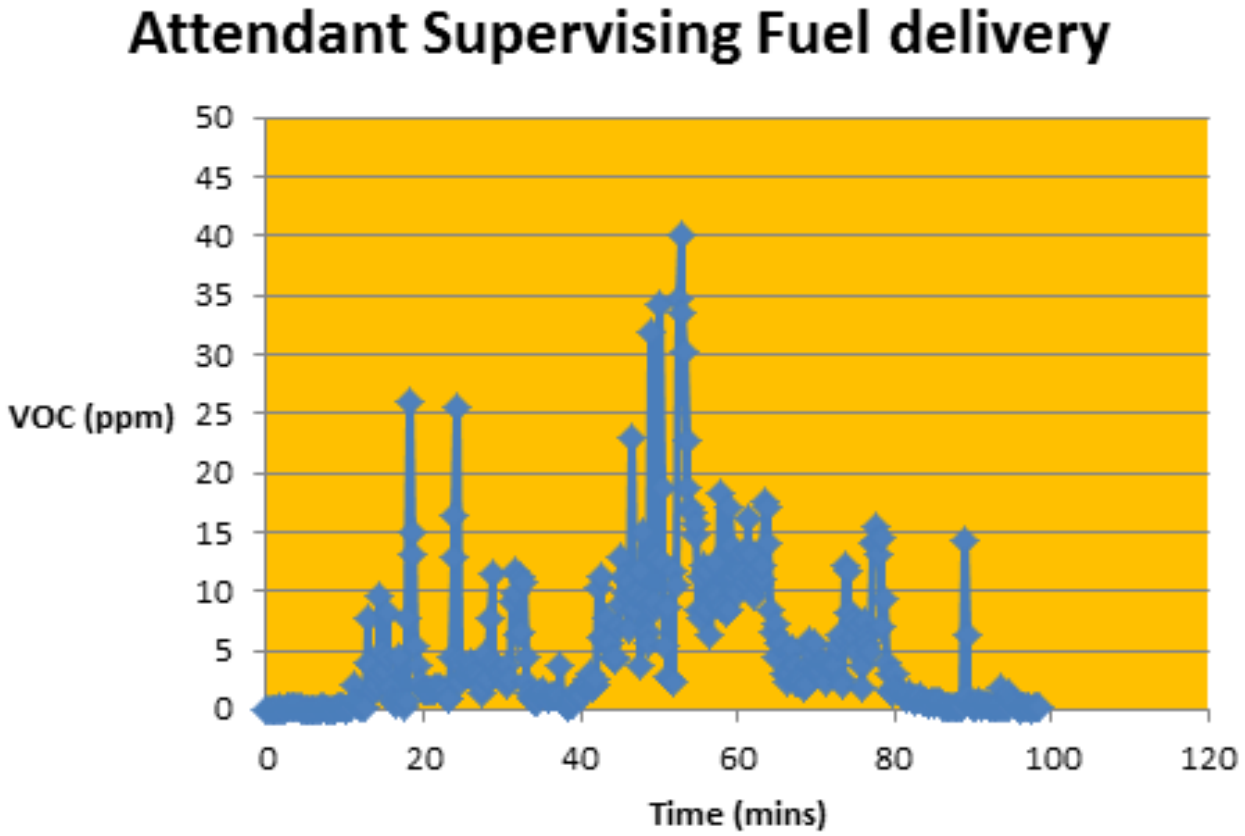
(VOCs not detectable with passive badge, PID average VOC level3ppm)





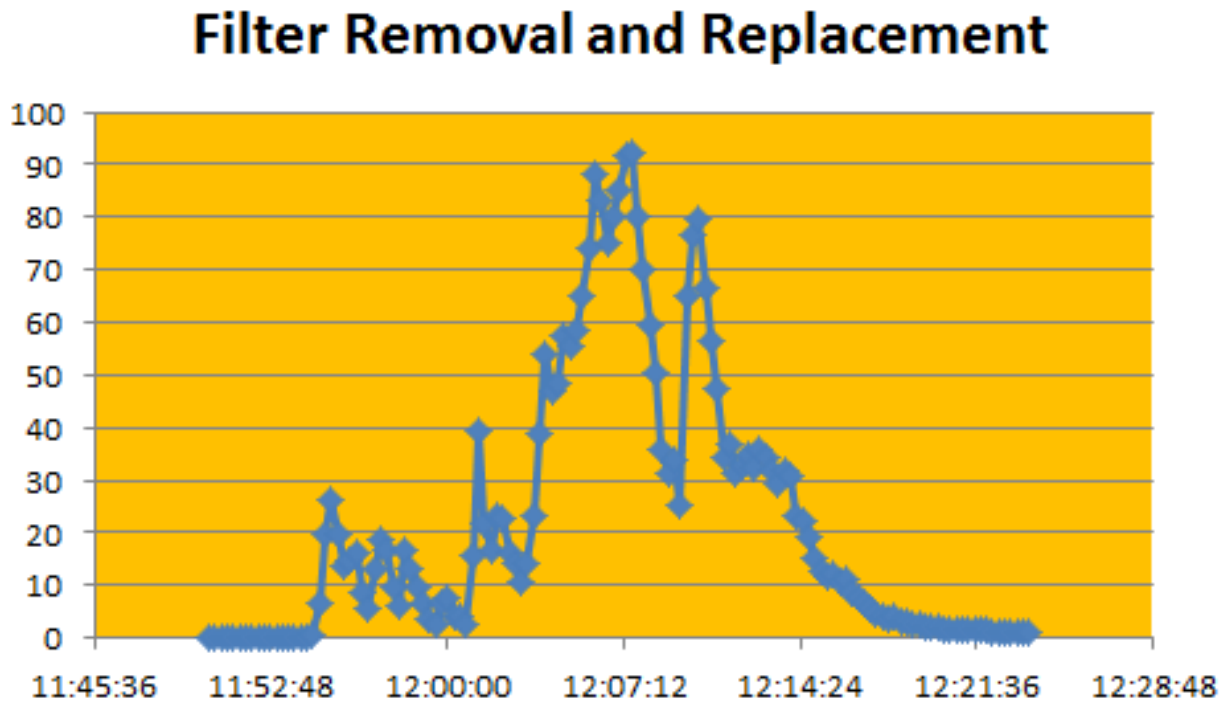
ATTENDANT ON TOP OF TANKER SAMPLING AND TESTING

(Task average 5.4ppm VOC, 0.09ppm benzene; PID average 4.9ppm)

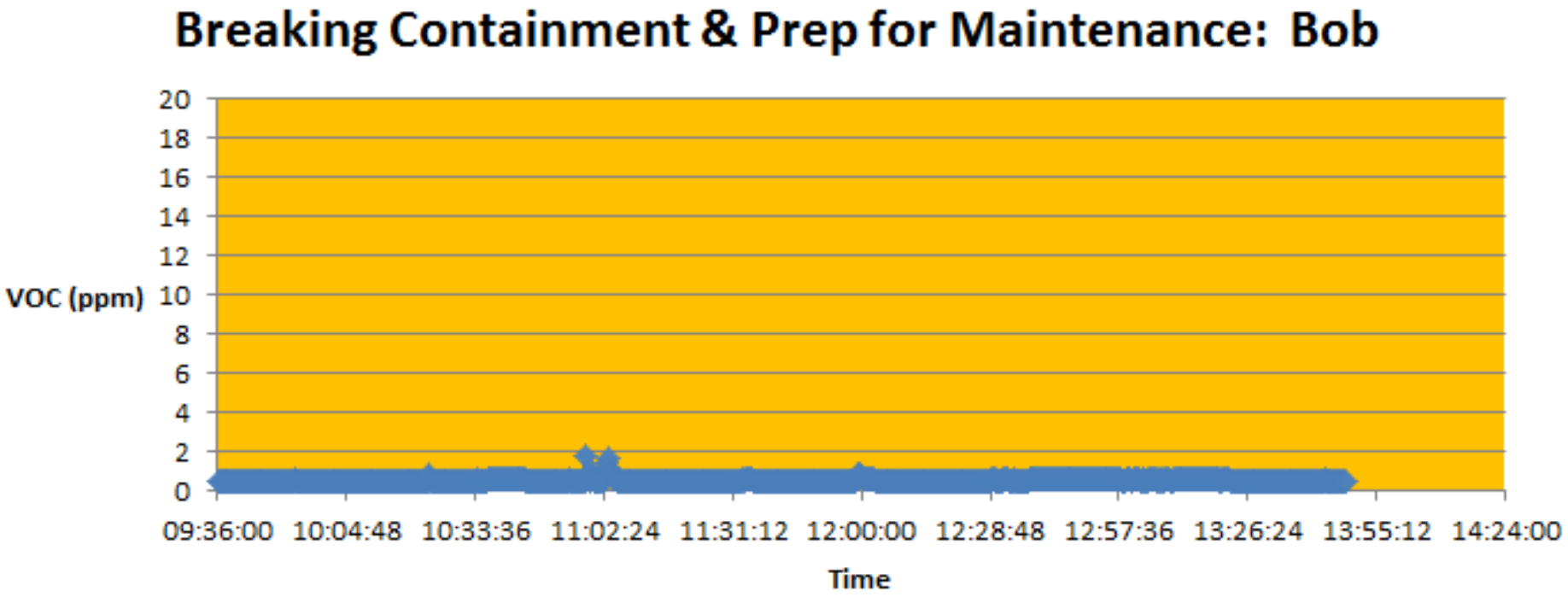


TYPICAL HIGH VOC/ BENZENE EXPOSURE ACTIVITY

(Task average 16ppm VOC, 5ppm benzene; PID average 23ppm)

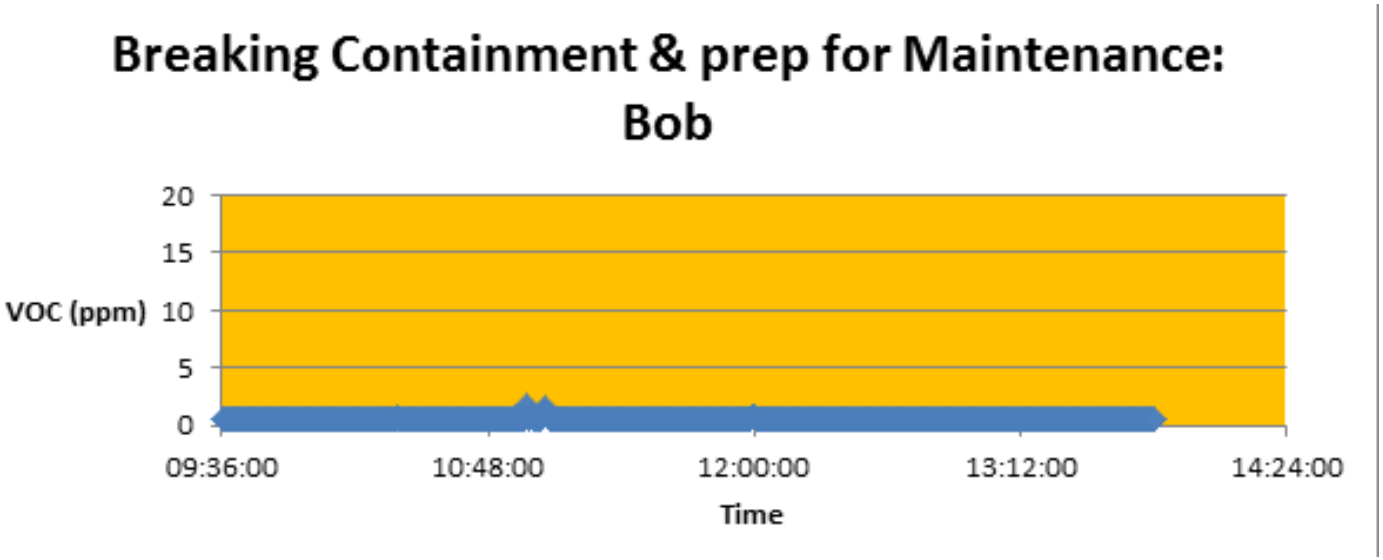


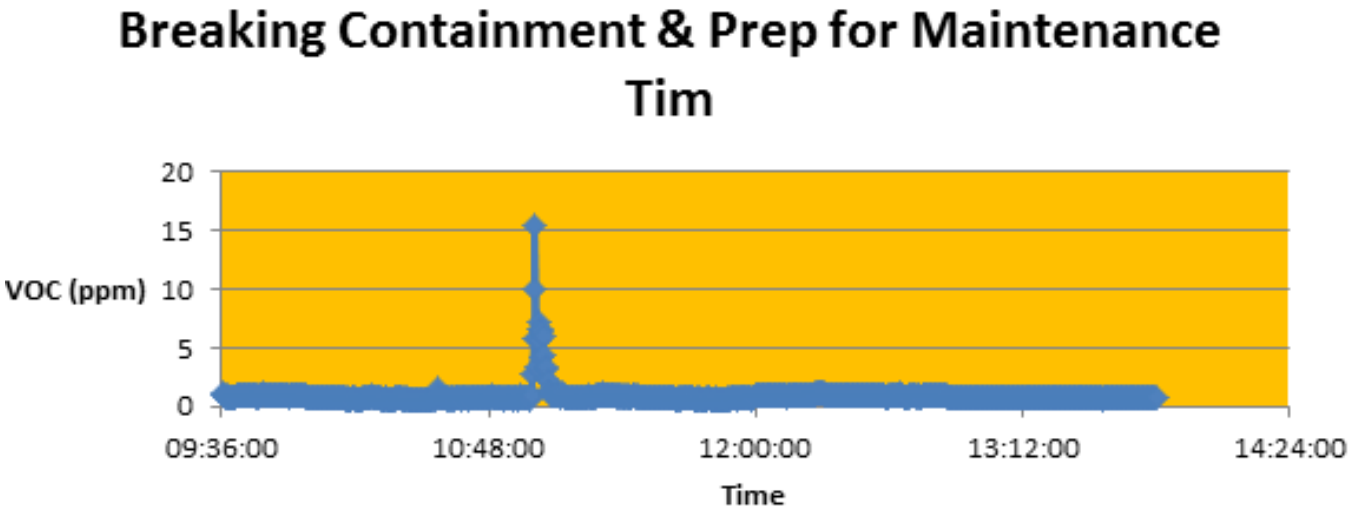
EXPOSURE PROFILE – IS IT WORTH ANALYSIS COST?



INFORMATION FROM SMALL SAMPLE PEAK

(Tim: Benzene not detected. VOC average 0.16ppm (3ppm 15 minute) with pumped sample, 15 minute PID average 2.3ppm). Tim close to liquid drain point briefly).



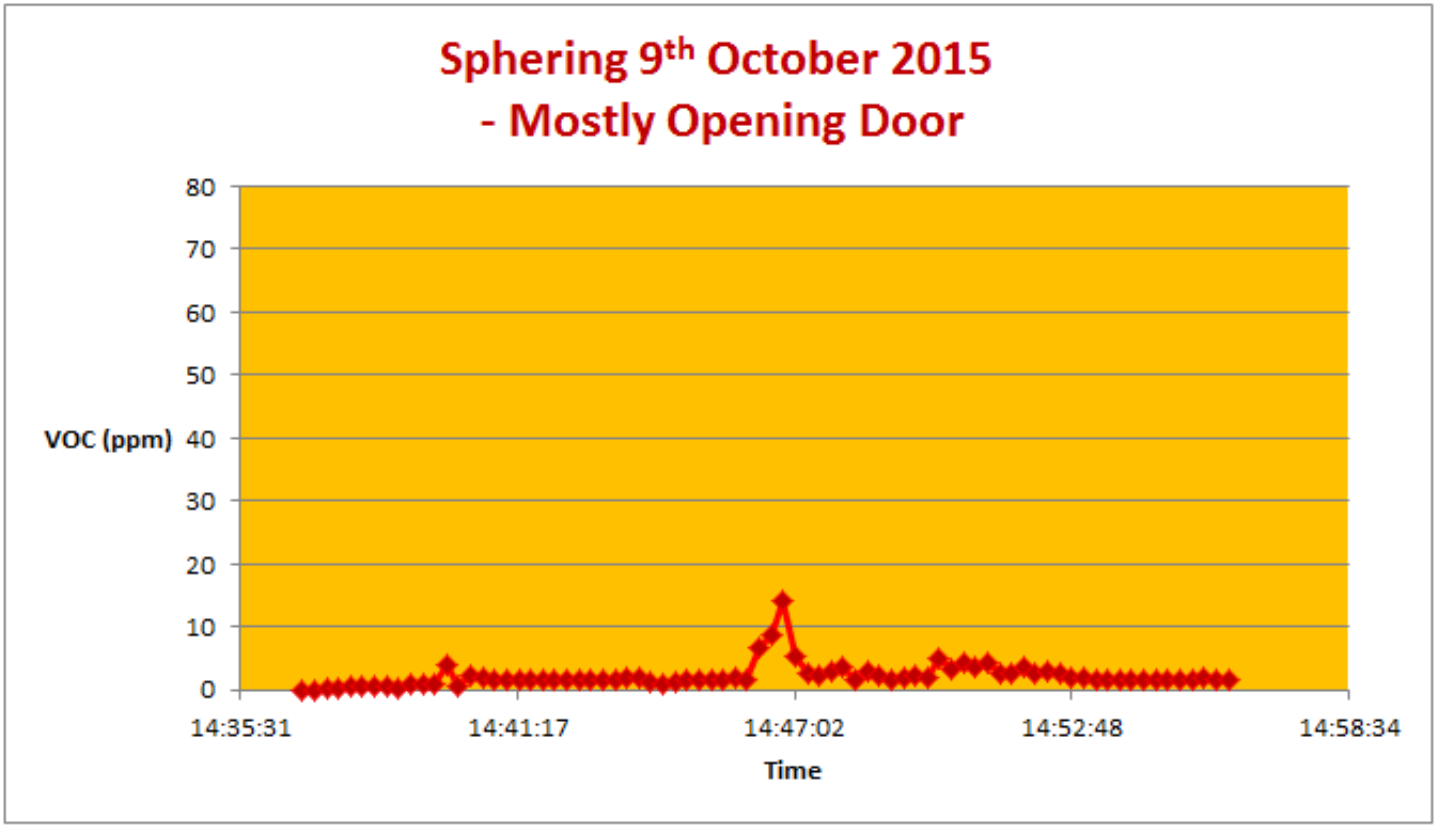


SPHERING (PIGGING) OF PIPELINES

- Regular activity to clean pipelines;
- Plant criticised for CoSHH Assessment which failed to cover all exposures;
- Which gives highest exposure ?
  - Opening the hatch or,
  - Washing down?

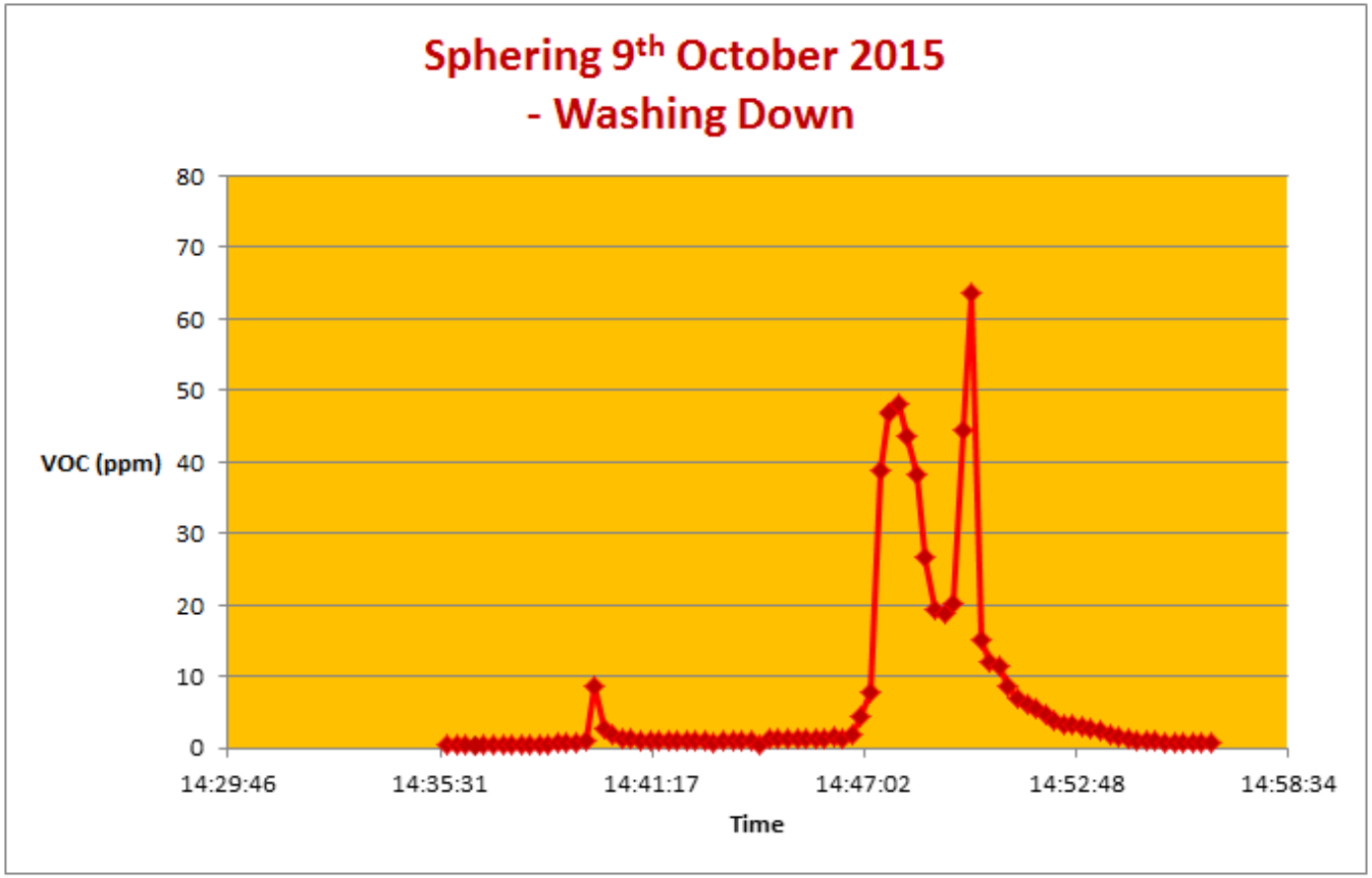
EXPOSURE DURING DOOR OPENING

(Task average <0.08ppm benzene, 0.29ppm VOC, PID average 0.5 ppm)



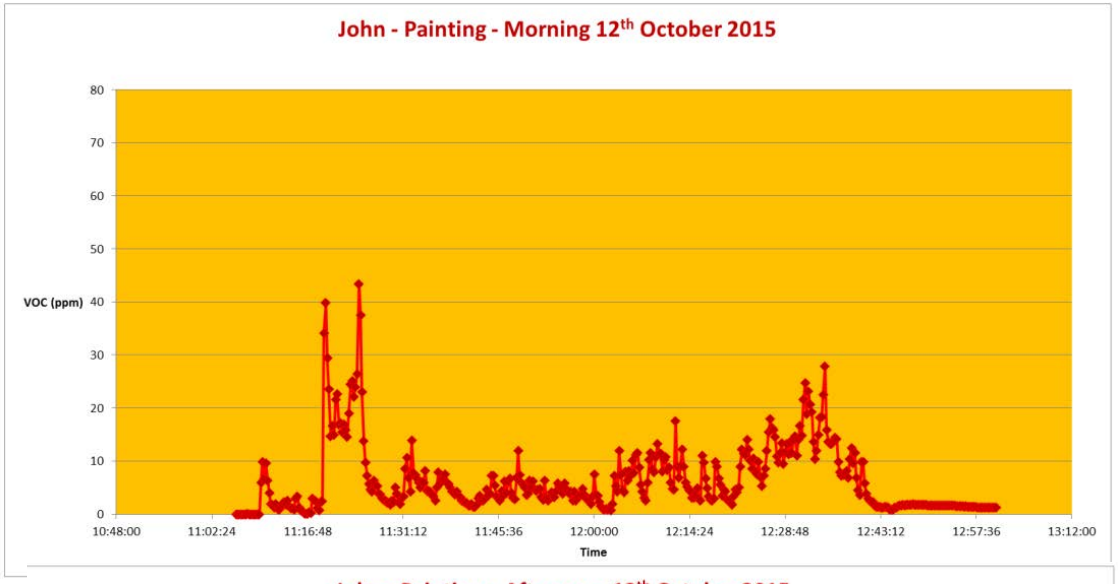
EXPOSURE DURING WASHING DOWN

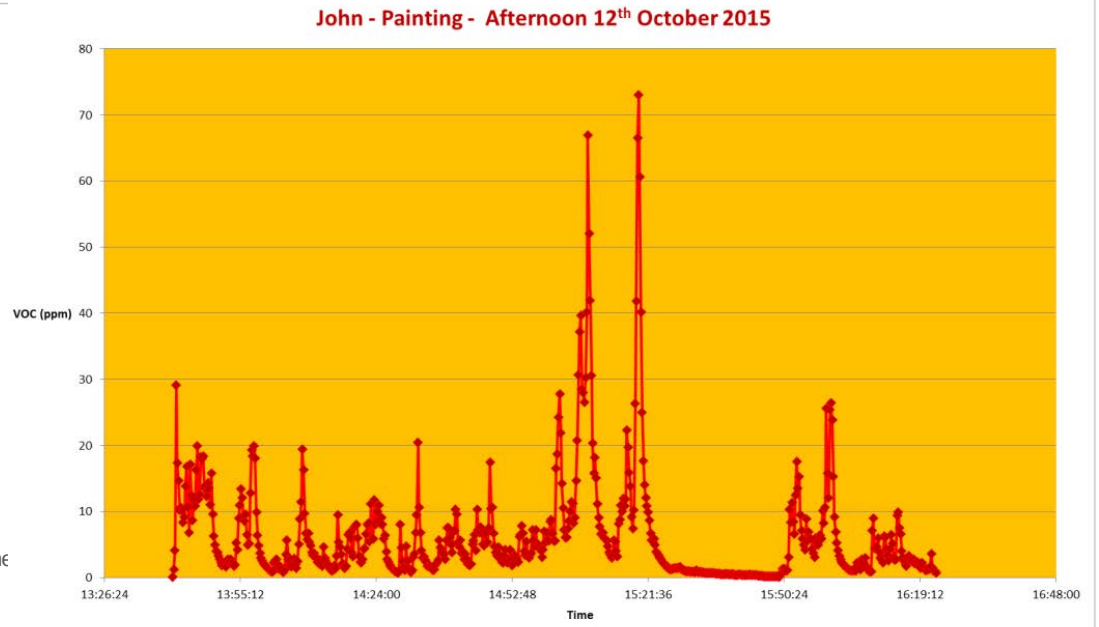
(Task average 0.16ppm benzene, 2.3ppm VOC, PID average 5 ppm)



PAINTING EXPOSURE PROFILE

(Task average 5.5ppm; PID average 5.5ppm)





USE OF THE ALARM FUNCTION

- Refinery: Hardcut Benzene Splitter
- Significant exposure to benzene possible;
- Trialling use of PIDs to warn of high exposure;
- Some issues with drift etc. to be overcome.

SUMMARY

- PID Devices provide a useful supplement to pumped and passive badge monitoring for organic compounds;
- Useful to characterise exposure profiles;
- Helpful for staff awareness;
- Help determine whether sample analysis is actually required.

Q&A