

Observations

Further investigation revealed the following potential sources:

- Toluene “hits” were site-dependent; 75% of sites had no hits, whereas other sites were up to 100% positive for toluene. This suggested transport or field sources rather than a laboratory problem.
- Laboratory method blanks associated with the “hits” were non-detect.
- Trip blanks, although submitted infrequently, were all non-detect. No field blanks were identified to have been submitted.
- Maxxam’s standard container and methanol batch proofing procedures showed the vials were VOC-free when distributed.

The investigation was later expanded to include other sampling materials. A key finding was that **packing tape often used to seal coolers and often used by field technicians to secure labels can contain high concentrations of toluene that may contribute to sample contamination (“hits”)**. Levels varied widely with brands and some examples are provided in Table 1 below.

Table 1: Toluene Levels Found in Packing Tape Brands

TAPE BRAND	TOLUENE (MG/KG)
U-Line S-6533	2,800
U-Line S 3267	20
U-Line S2786	35
U-Line S7593	625
U-Line S119	5
Tartan Brand 369	5
Scotch Shipping	6
U-Line S423	7
Cantech 257-00	3
IPG Acrylic (2008121)	0.038

In addition, most tape products tested contained traces of other VOCs, but toluene was by far the principal VOC. One exception was Cantech 257-00, which contained 13 mg/kg acetone.

Controlled experiments were conducted in the laboratory on the two highest toluene-containing tapes (U-Line S6533 & S7593). They were left in proximity to sealed methanol vials with septa caps over a 5 day period. The data showed “hits” up to 0.16 ug/g, equivalent to 8 times the soil RDL of 0.02ug/. The effect was mitigated using solid cap vials, however detectable levels below the RDL were still observed. The toluene concentrations reported in this study are comparable to or greater than the low level “hits” identified in customer submitted samples.

Recommendations

In order to minimize the chance of the introduction of air borne toluene, Maxxam recommends the following:

- **Use low VOC tape to seal your cooler** prior to shipping it to the laboratory. Maxxam studies show that Intertape Packing Group 2008121 is the lowest toluene-containing product and performs equally well to other products.
- **Avoid using packing tape on contents going into the cooler.** Maxxam studies show that bubble wrap and Ziploc® bags are toluene free.
- **Keep motor vehicles distant from the site and never store vials in motor vehicles.** Auto emissions are a major source of VOCs.
- **Conduct a regular program of Trip Blanks and Field Blanks.**
- **Minimize the amount of time sample vials are open onsite.** Field blank samples should be left open for the same amount of time as the sample vials.

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For more information, please contact:

enviro@maxxam.ca

Or 1.800.563.6266