

**Continuous Monitoring of VOCs
in the St. Clair River by the
Sarnia Lambton Environmental Association**



Location of the Water Monitor

Approx.
Distance
(kilometres)

0

10

20

30

40



Approx.
Travel Time
(hours)

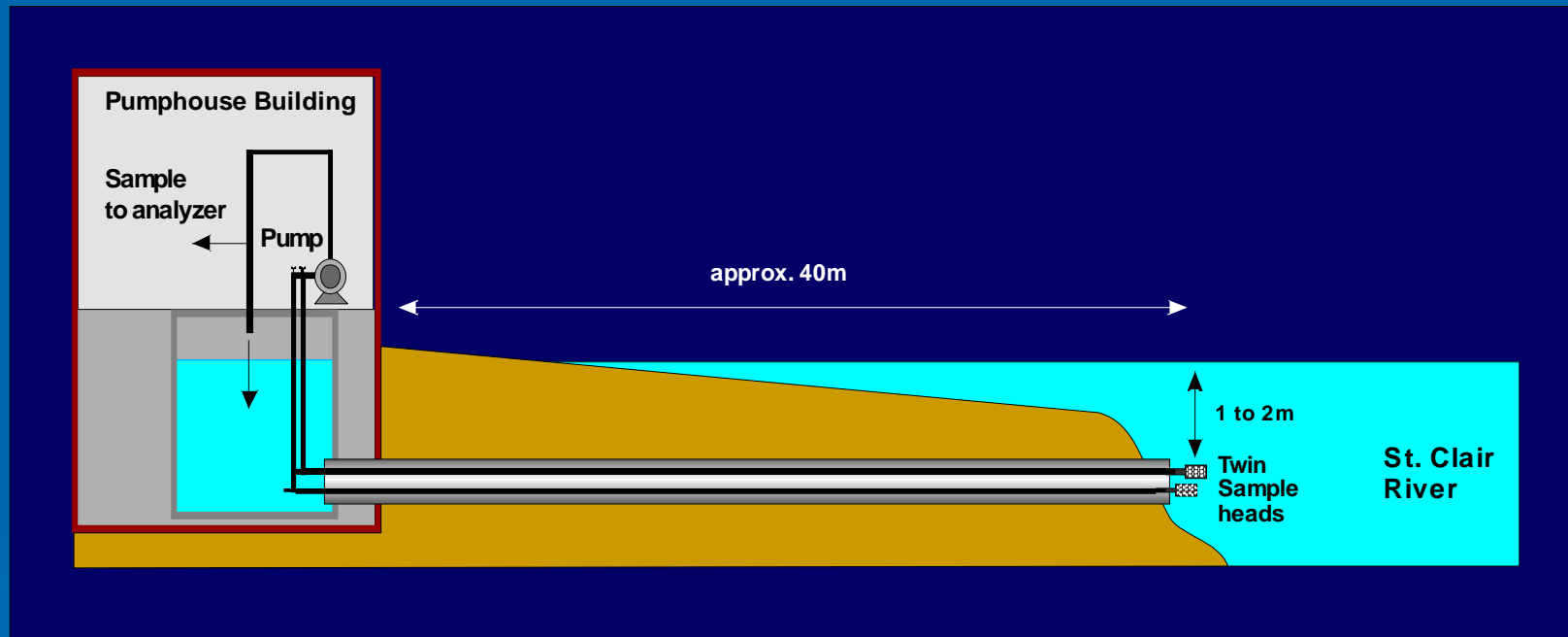
0

5

10

20

SLEA CM Intake Location



Modeling and grab sample data has shown that this location, on the edge of the main channel, is ideal for instances of shore-based releases.

Contaminants Currently Analyzed

minimum detection limits in micrograms per litre (ppb)

➤ MTBE	0.10	➤ toluene	0.08
➤ hexane	0.10	➤ perchloroethylene	0.08
➤ chloroform	0.13	➤ ethylbenzene	0.08
➤ cyclohexane	0.04	➤ m+p-xylene	0.16
➤ carbon tet	0.13	➤ o-xylene / styrene	0.16
➤ benzene	0.05	➤ 1,3-dichlorobenzene	0.09
➤ 1,2-dichloroethane	2.90	➤ 1,3-diethylbenzene	0.12
➤ trichloroethylene	0.05	➤ 1,2-diethylbenzene	0.09
➤ 1,2-dichloropropane	0.09	➤ tetraethyl lead	0.27

Continuous Monitor Results for all Detected Compounds in 2009



8,686 samples → 173,720 analyses

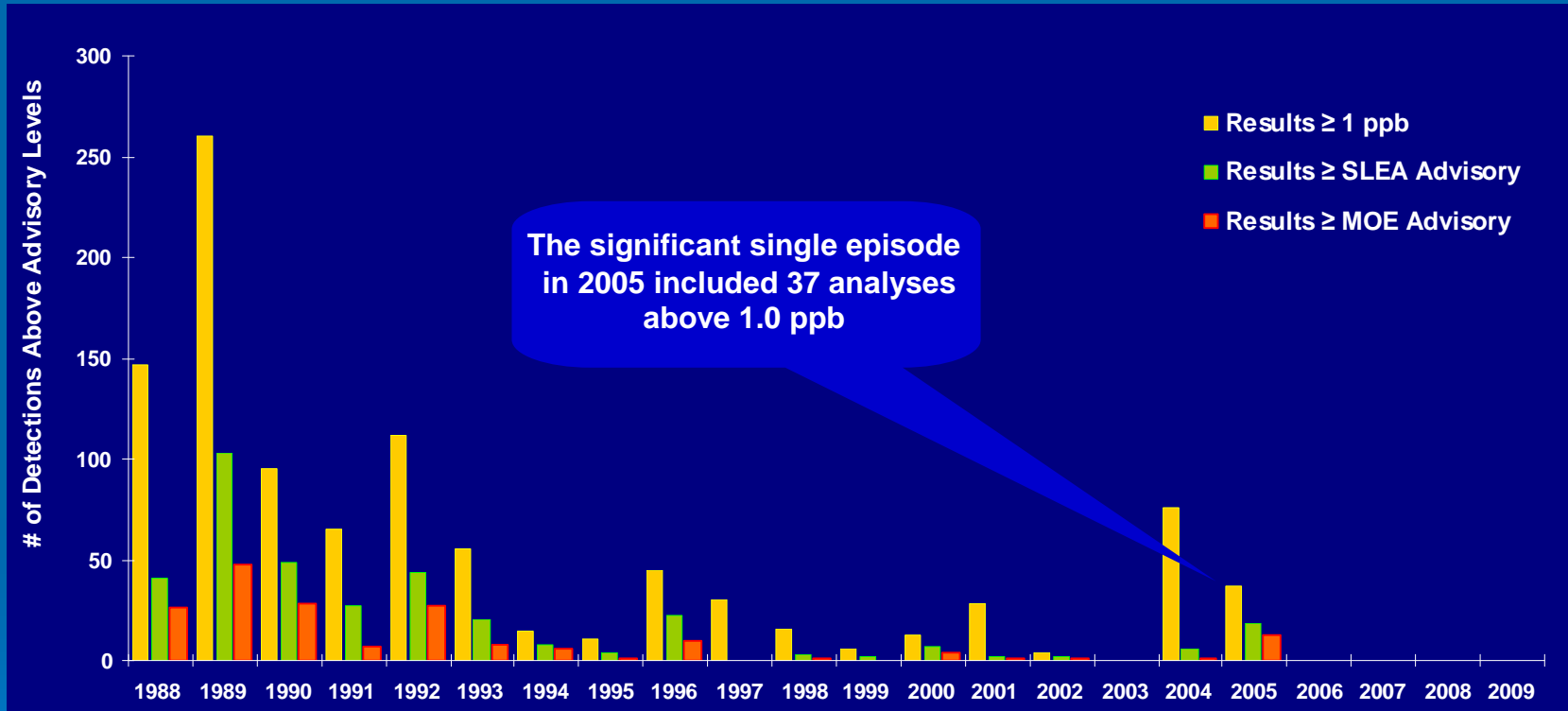
15 of the 20 VOCs not detected

99.31 % of analyses were below detection limits

Reliability: on-line time of 99.9 %

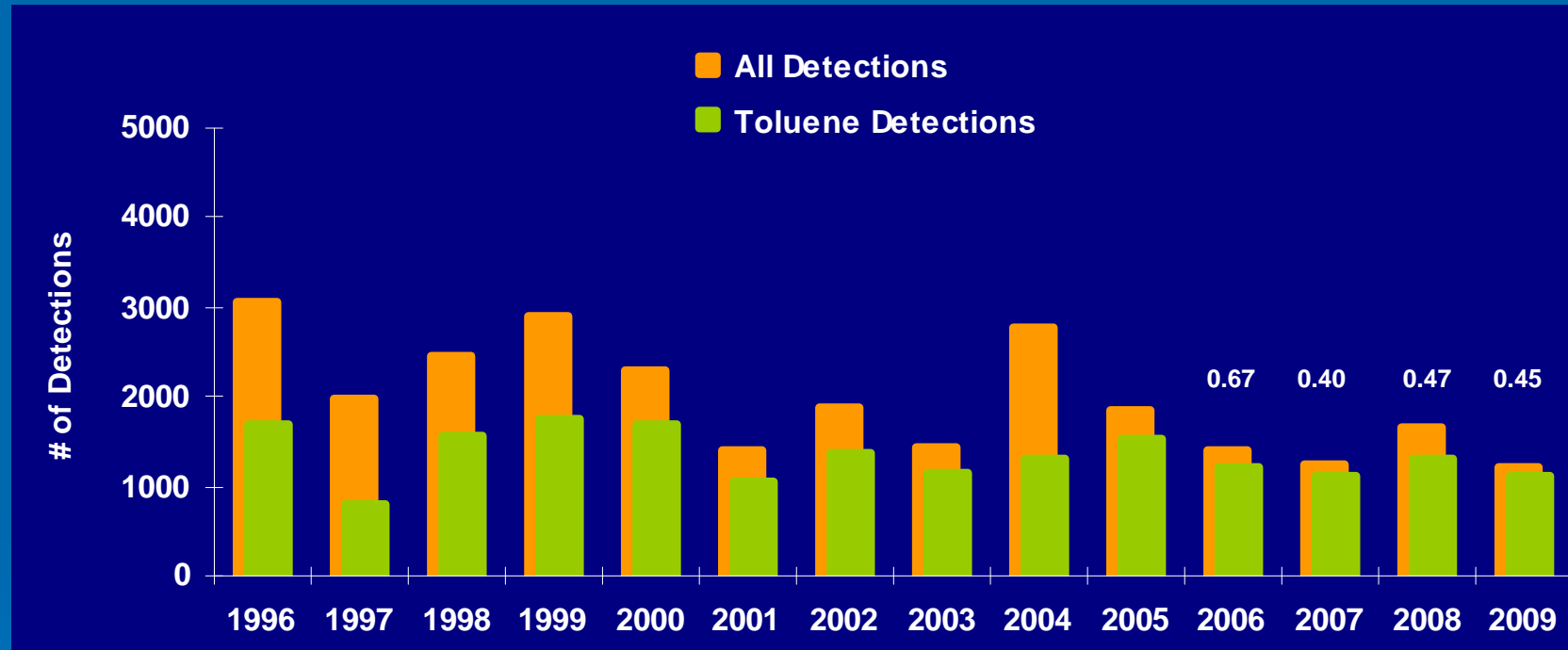
Compound	Detection Limit (mdl) (ppb)	Frequency of Detection (%)	Number of Analyses	Average (ppb)	Min (ppb)	Max (ppb)
Cyclohexane	0.04	0.2	14	< mdl	< mdl	0.10
Benzene	0.05	0.4	32	< mdl	< mdl	0.08
Toluene	0.08	13.0	1127	< mdl	< mdl	0.45
m+p-Xylene	0.16	0.4	33	< mdl	< mdl	0.27

Historical Review of Results > 1ppb and Advisory Levels



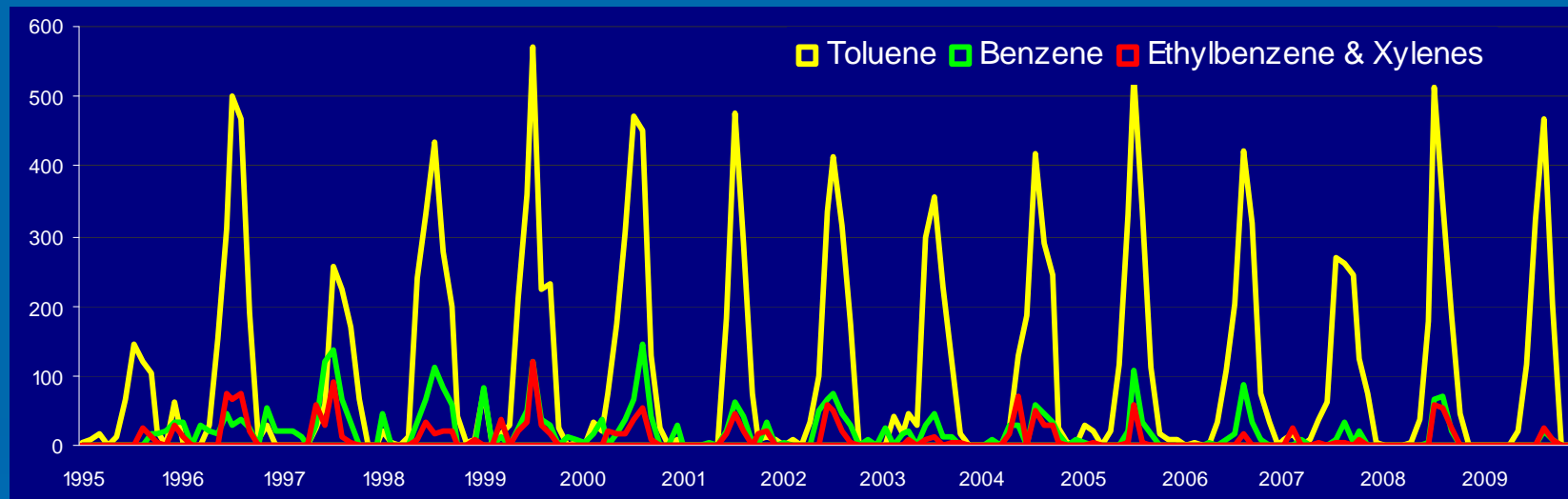
An episode is recorded when one or more contaminants exceeds 1.0 ppb for a limited timeframe. The use of 1.0 ppb merely provides a convenient reference to track change.

Number of Detections 1996-2009



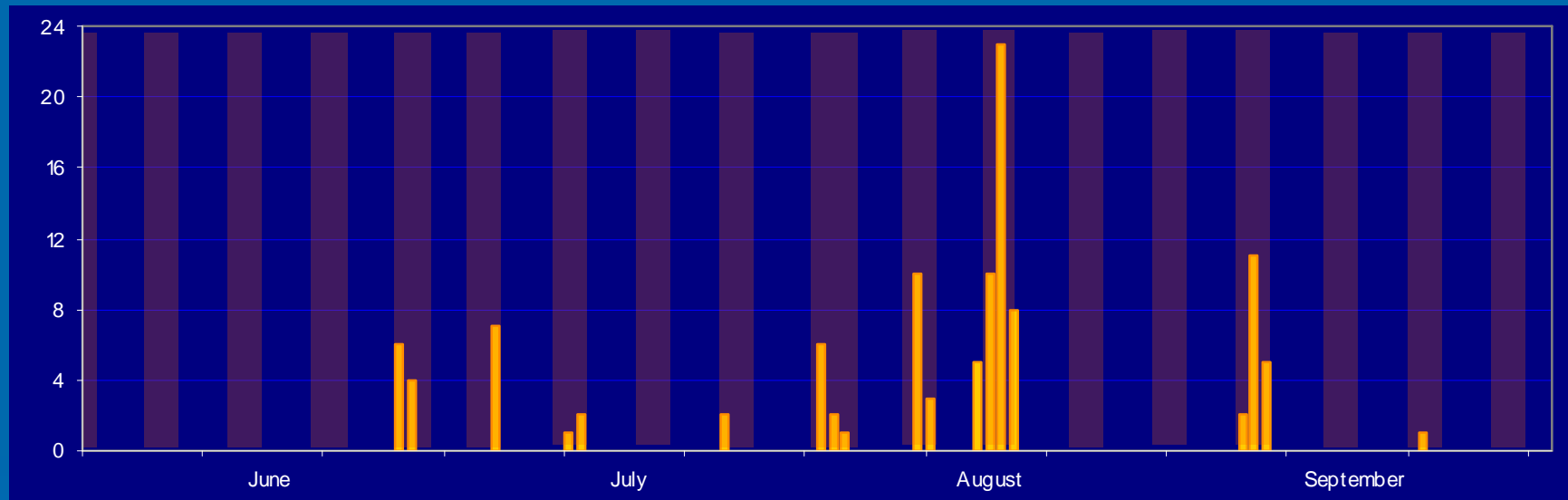
The values shown above the bars for 2006 to 2007 are the maximum concentrations (ppb) seen for that year (all for toluene). The SLEA “trigger” level for toluene is 5 ppb. The long-term drinking water criteria (MOE) for toluene is 24 ppb and is based on aesthetic concerns.

Seasonal BTEX 1995-2009 (# of Detections)



All compounds show elevated levels during the summer months.

Summertime Detection of Toluene (# of detections/day)



The shaded areas represent weekend timeframes. Studies have shown a direct relationship between detection of toluene (and to a lesser extent, benzene & xylenes) and pleasure boating activities