



# “The Right to No”: OSHA and Exposure Limit Information

OSHA Rulemaking Hearing on HazCom Changes  
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## Three Scientific Points and One Policy Observation:

1. It makes no sense for the stakeholders who have the vendetta against the TLVs to pressure OSHA to drop them in favor of the PELs, since roughly 410 of the 425 PELs **ARE** TLVs (just 40 or more years out of date)!
2. The comparison between methylene chloride and *n*-propyl bromide, to give one example out of many, shows starkly how dangerous it would be to disclose PELs but not TLVs.
3. The PELs set since 1970 are *not* in fact based on risk, so they fail utterly to communicate useful information to purchasers and workers. This is a HazCom standard, not a “chemical economics communication” standard.
4. Producers who complain about having to disclose the TLV are being hypocritical, as they continue to exercise the option to surround their data sheets with exculpatory “information.”

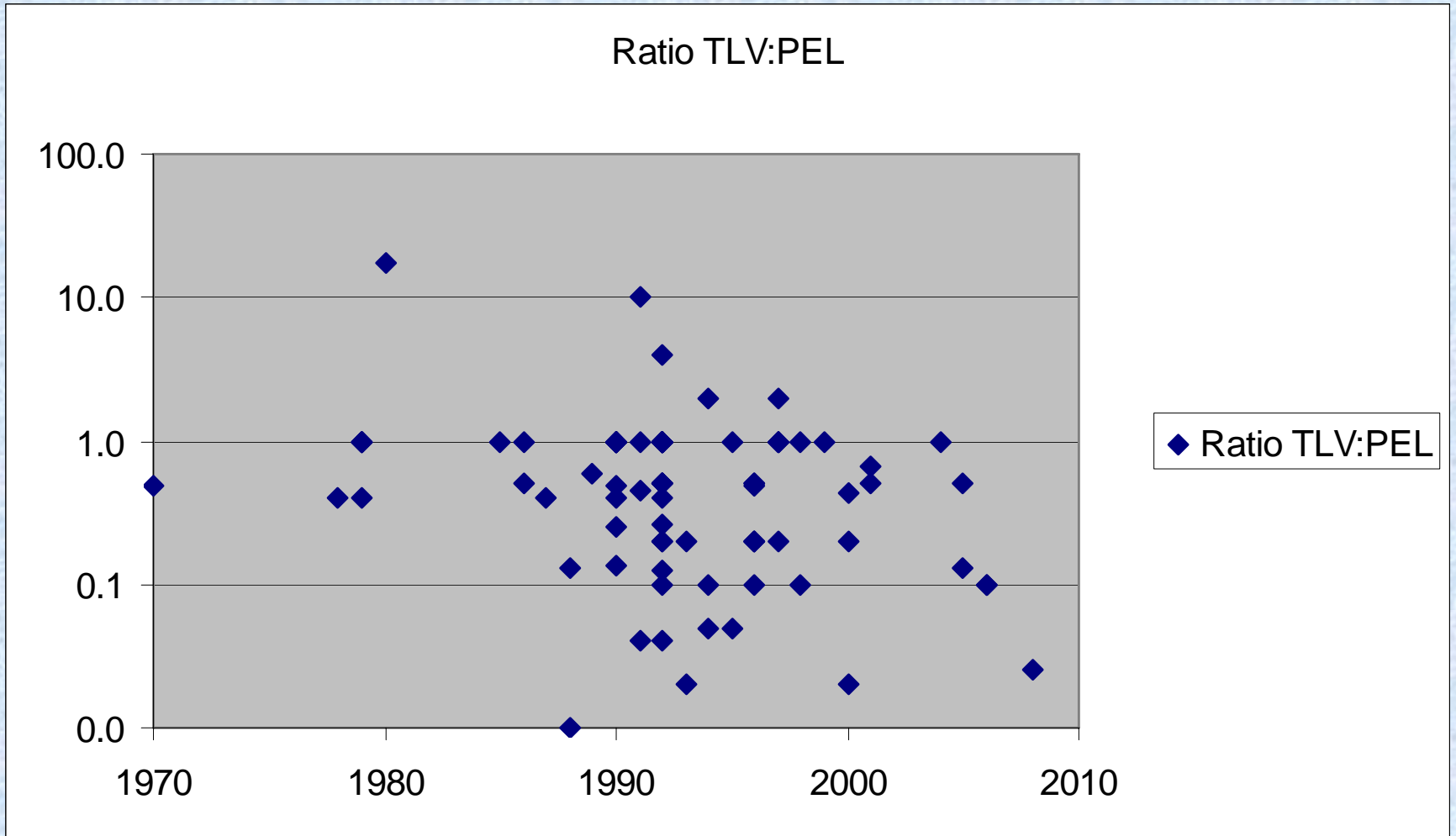
1-Bromopropane: no PEL, TLV=10 ppm  
(Methylene Chloride: PEL= 25 ppm)

- *CDC Morbidity and Mortality Weekly Report* (12/5/08) published a case report of a 43-year-old man in NJ who had recently begun dry cleaning with “DrySolv”(1-BP)– hospitalized with headaches, fatigue, visual disturbances, twitching, and joint pain– also a PA man hospitalized with ataxia and neuropathy (1-BP levels in his degreasing operation approx. 175 ppm);
- *Journal of Env'tl and Occup'l Medicine* (9/07) reported on 4 furniture workers using 1-BP glue (18 - 254 ppm in air) who developed inability to walk, pain, numbness, vomiting– persisting for up to 8 years after leaving workplace;
- Majersik et al (2007) reported that 6 workers exposed to roughly 100 ppm 1-BP while gluing furniture developed chronic neuropathic pain, persisting for years after leaving their workplaces.
- *European J Endocrinology* (1998) reported on 16 Korean workers using 2-BP who developed primary ovarian failure.

## New NTP Cancer Bioassay of 1-BP:

- 18% of female mice exposed to 62.5 ppm developed lung tumors (2% of control mice)
- rare intestinal tumors found in male and female rats
- I calculated the cancer potency factor (linearized multistage model, 95<sup>th</sup> UCL on linear term) from this bioassay as  $3.0 \times 10^{-4}$  per ppm (45-year, 40 hr/week adjustment)
- (Using identical method, the cancer potency factor for the NTP bioassay of methylene chloride is  $8.8 \times 10^{-5}$  per ppm, a factor of 4 smaller)

# The TLVs are Much More Worker-Protective than the PELs, Especially in More Recent Years:



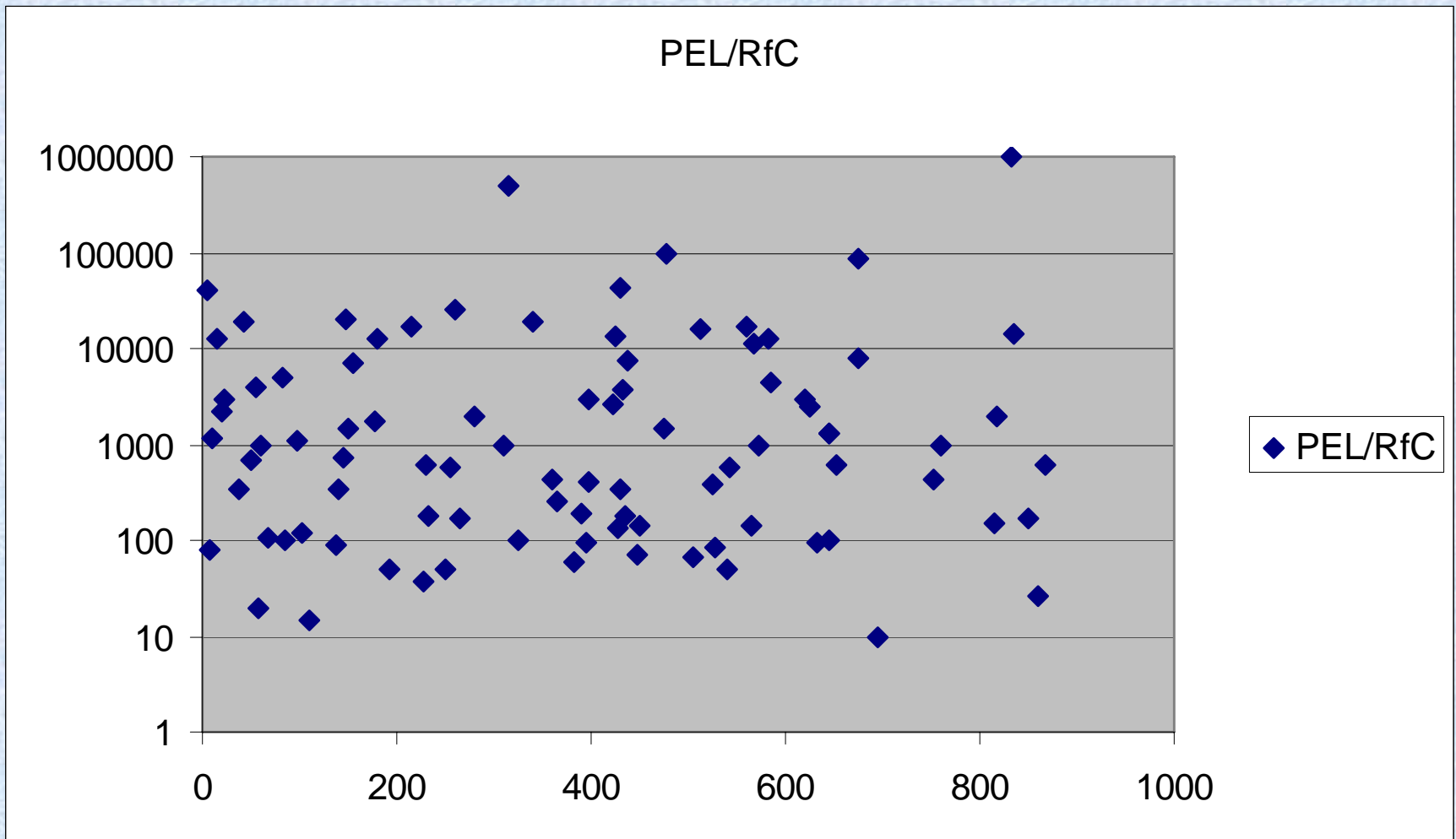
The TLVs Reflect Much More Consistent Risk Levels than the PELs Do:

PEL/RfC

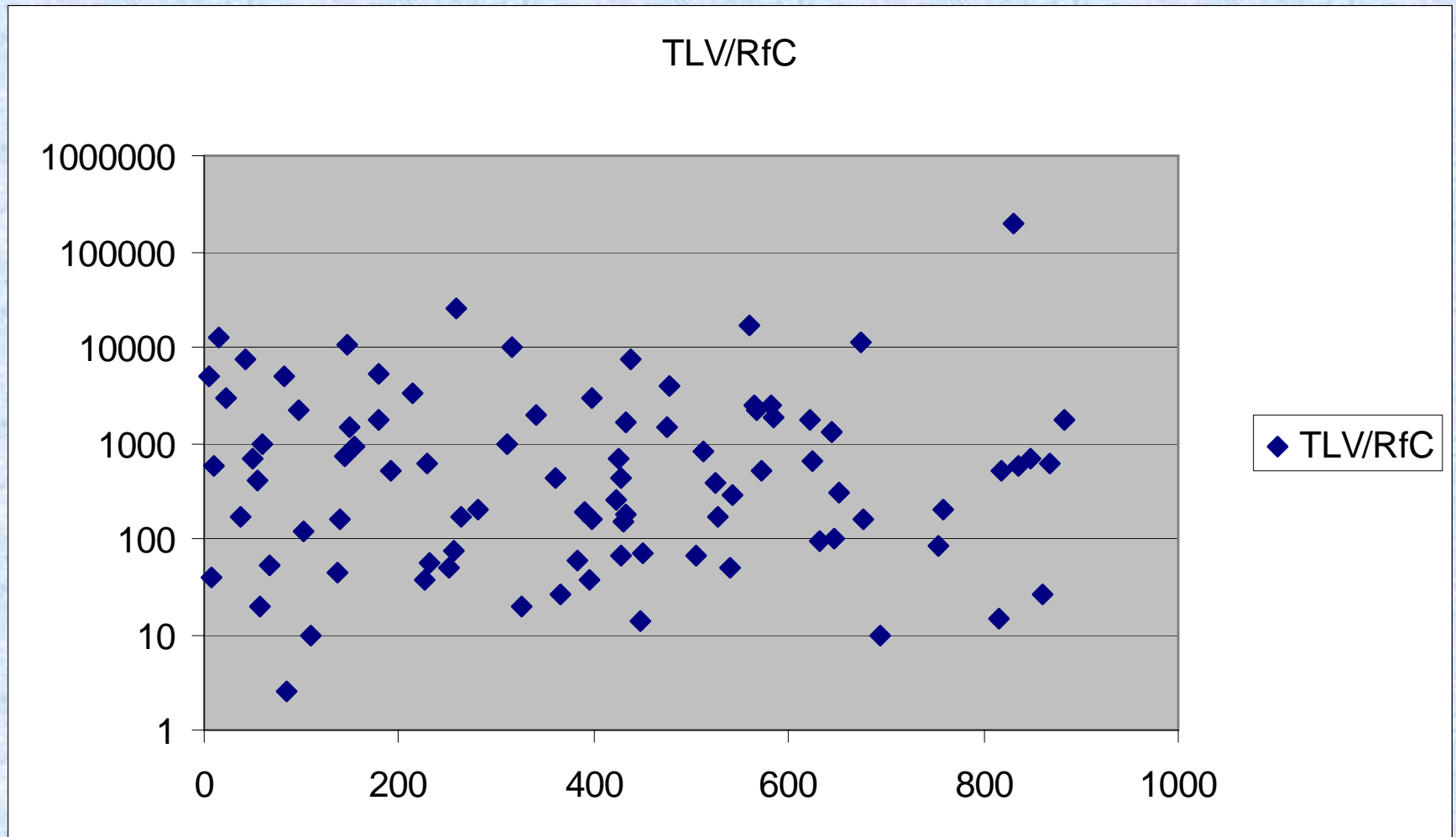
TLV®/RfC

minimum	10 (selenium)	2.5 (beryllium)
25 <sup>th</sup> percentile	140	84
median	857	500
75 <sup>th</sup> percentile	4,875	1,770
maximum	1,000,000 (1,2,3-trichloropropane)	200,000 (1,2,3-trichloropropane)
Ratio 75 <sup>th</sup> :25 <sup>th</sup>	35	21
mean of logs	3	2.6
# outside of [10, 10000]	19	6

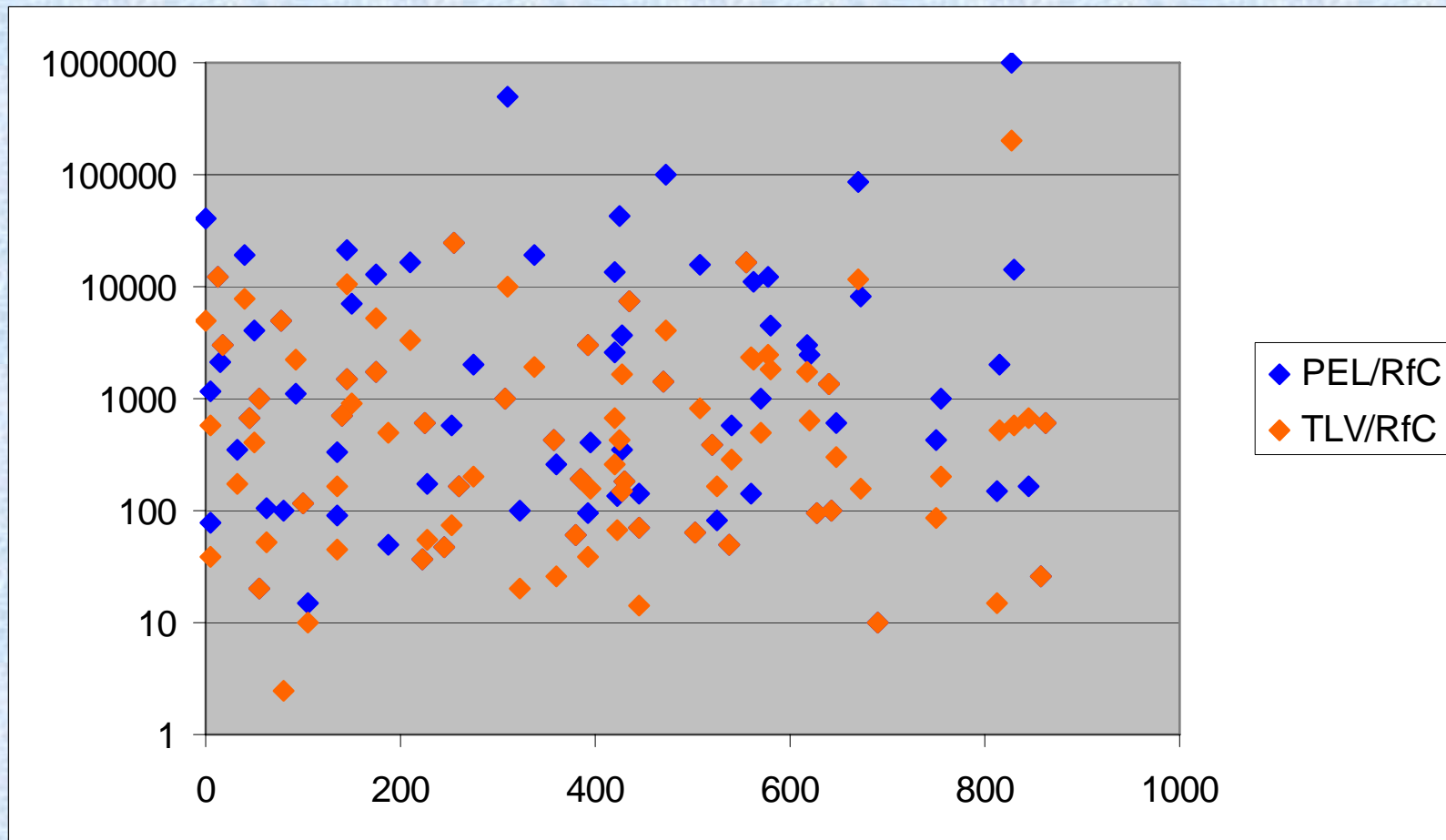
(excluding outliers, most of the PELs are between 50 and 50,000 times the EPA RfC— a factor of 1000 dispersion about this “gold standard” of non-cancer risk)

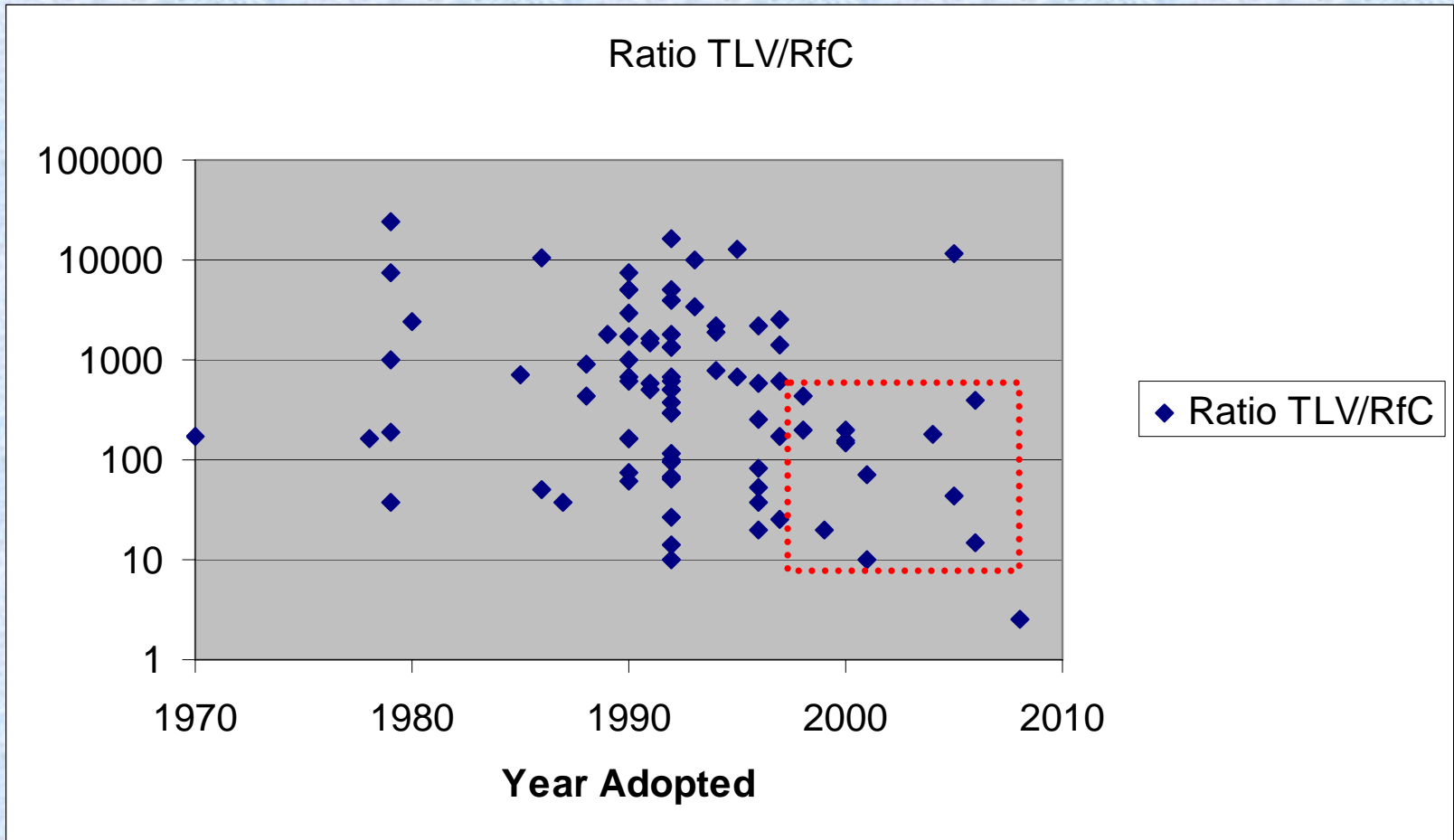


(excluding outliers, most of the TLVs are between 20 and 10,000 times the EPA RfC— a factor of 500 dispersion about this “gold standard” of non-cancer risk)



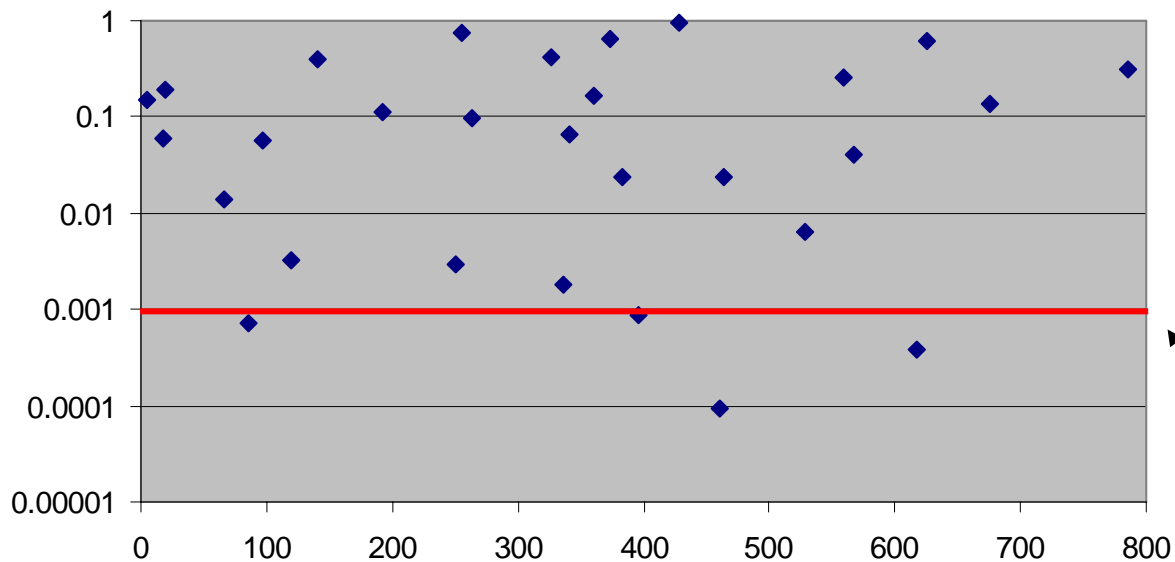




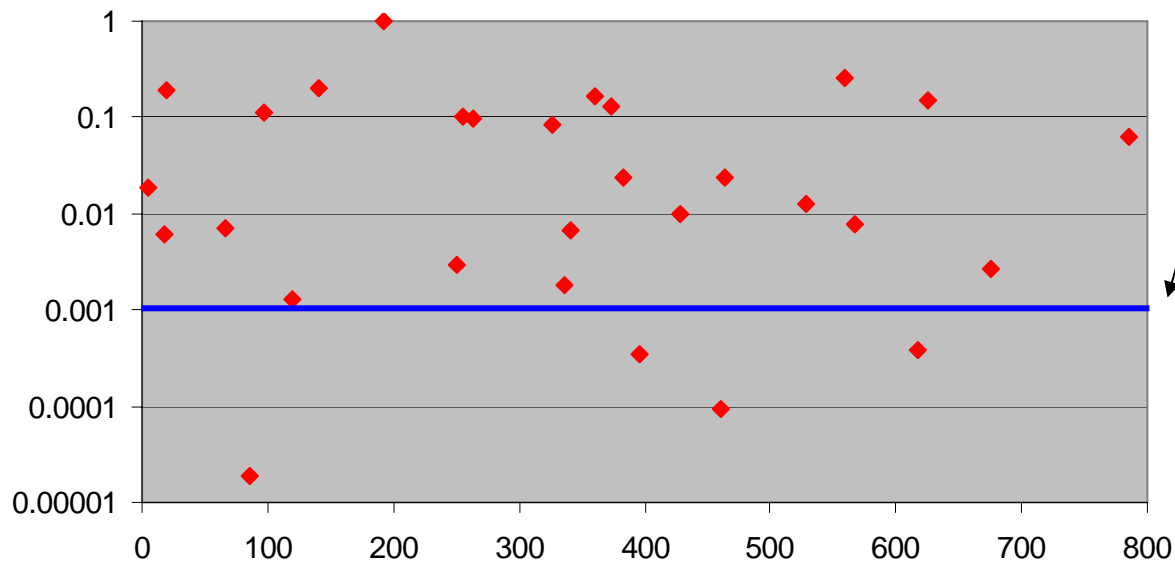


- 11 of the most recent 13 TLVs are within 10x to 400x of the RfC (factor of 40 dispersion)
- Of 5 TLVs from 1979, GM (TLV/RfC)= 1060;  
of 6 TLVs since 2004, GM= 105

Cancer Risk at PEL



Cancer Risk at TLV



1/1000: uppermost end of Supreme Court acceptable risk range in *Benzene*

# Nutrition Facts

Serving Size 1 Twinkie (148g/5.3oz)

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**Amount Per Serving**

**Calories** 100    **Calories from Fat** 81

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% of production cost

**Total Fat** 9g                      **19%**

    Saturated Fat 0g              **0%**

**Cholesterol** 0mg                **0%**

**Sodium** 0mg                    **0%**

**Potassium** 720mg              **21%**

**Total Carbohydrate** 26g    **9%**

    Dietary Fiber 3g              **12%**

    Sugars 3g                      **39%**

**Protein** 4g

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Vitamin A 0% • Vitamin C 45%

Calcium 2% • Iron 6%

Thiamin 8% • Riboflavin 2%

Niacin 8% • Vitamin B<sub>6</sub> 10%

Folate 6% • Phosphorous 6%

Zinc 2% • Magnesium 6%

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SHORTEST

Snorting Elk



LONGEST

Northway Ridge



SUNNY

Right Angle



SHADY

N. Back Country



“SNORTING ELK”

This is what workers and users of MeCl<sub>2</sub> learn from  
Dow Chemical's current (2009)  
Material Safety Data Sheet:

**CARCINOGENICITY:** Methylene chloride has been shown to increase the incidence of malignant tumors in mice and benign tumors in rats. Studies have shown that tumors observed in mice are unique to that species. Other animal studies, as well as several human epidemiology studies, failed to show a tumorigenic response. Methylene chloride is not believed to pose a measurable carcinogenic risk to man when handled as recommended.

## Origins of Dow's Claim:

“This research, *which is now complete*, shows that B6C3F1 mice... are uniquely sensitive at high exposure levels to methylene chloride-induced lung and liver cancer, and that other species, including humans, are not at similar risk... As a result of this research program, it appears that there are *no foreseeable conditions in which the carcinogenic effects seen in mice would be expected to occur in man.*”

-- from HSIA letter to OSHA, Oct. 1995 (emphasis added)  
(62 FR 1520)



# Scientific Reaction to HSIA Research: 1

“This experiment [comparing spectra of DNA point mutations caused by MC with those caused by formaldehyde and 1,2-dibromoethane] is extremely weak and not of publication quality. It is unlikely that such a naïve experiment could detect differences in spectra between the different chemicals used... This exhibit contains no useful information for risk assessment.”

--Dr. Douglas Bell, NIEHS (62FR 1521)

## Scientific Reaction to HSIA Research: 2

“I have serious concerns about this [DNA single-strand breaks] assay. It is well known that this assay is extraordinarily difficult to standardize and is sensitive only to very high doses of genotoxic compounds... This data, therefore, is certainly not compelling; persuading any independent scientist of its relevance to humans would be difficult.”

--Prof. Karl Kelsey, Harvard School of Public Health (62FR 1521-22)

## Scientific Reaction to HSIA Research: 3

“This interpretation of mRNA distribution is profoundly in error and contradicts some of the most well established and fundamental principles of molecular biology... Finding mRNA in the nucleus is unsurprising and uninformative about the eventual location of the protein products.”

--Dr. Lorenz Rhomberg, Gradient Corp./Harvard School of  
Public Health (62 FR 1526)

# “Risk-Based Exposure Goals”: Right-to-Know for the Workplace

- ★ 6(b)(5) standards can take thousands of person-hours of work per substance-- but this is “5% calculation, 95% perspiration”
- ★ Our risk assessors, with help from NIOSH, could calculate 20-40 “risk-specific concentrations” per year
- ★ Each “RBEG” would be based on state-of-the-art risk assessment techniques, but would jettison many extraneous studies, need no extensive narrative write-up, and explicitly ignore feasibility issues entirely

# “RBEGs” Will Be Useful In:

- ★ Leveraging cooperation where we have no credible rulemaking threat;
- ★ Responding to ETS and other petitions;
- ★ Complementing 6(b) standards by increasing the cost of avoiding them via substitution to a more hazardous substance;
- ★ “Jump-starting” more extensive work on 6(b) stds.;
- ★ Giving workers the means to gauge whether they are at unacceptable risk (literature on success of TRI);
- ★ Providing “stretch targets” for leading companies to visibly meet (“Health-STAR” status?)