

**Dioxins and other health  
hazards in dust at Former  
Marble Quarry Landfill BCP  
site**

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# Polychlorinated dioxins & furans (PCDDs, PCDFs)

- A mixture of >100 types, with wide range of toxicities
- Formed during incineration/combustion
- 2,3,7,8-TCDD = “dioxin”

# Health effects of dioxins

## Acute:

- hair loss, swelling of the face, and moderate to severe chloracne

## **Chronic:**

- Cancer [“known human carcinogen”]
- reproductive damage and birth defects
- endocrine disruption
- interferes with immune system

# Sources of dioxins

- ~~chemical products (e.g. Agent Orange)~~
- incinerator ash
- combustion at the site

“I witnessed repeated spontaneous combustion of the site. There were Eastchester Fire Trucks parked in front of the Quarry because of the constant fires. As they kept filling the quarry with toxic debris, ash, and all sorts of containers of combustible chemicals, the area would ignite.”

-testimony of longtime resident of Tuckahoe, J. Marinello

# How can one be exposed to these chemicals?

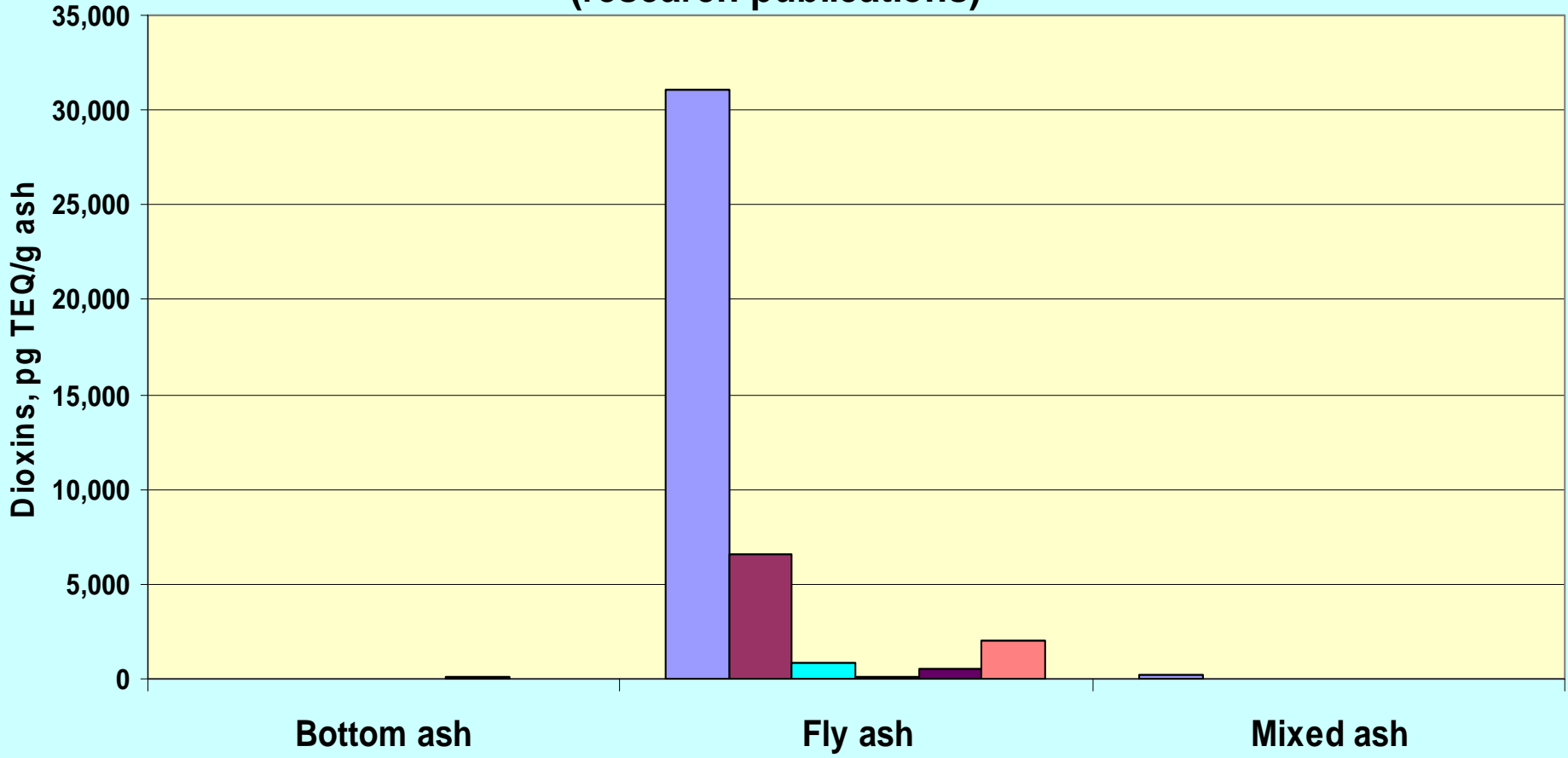
- Dust from site becomes airborne during construction
  - hot spot soil removal
  - grading of entire site
  - trenches for drainage
  - driving piles = hotel foundation

# Current science on dioxins

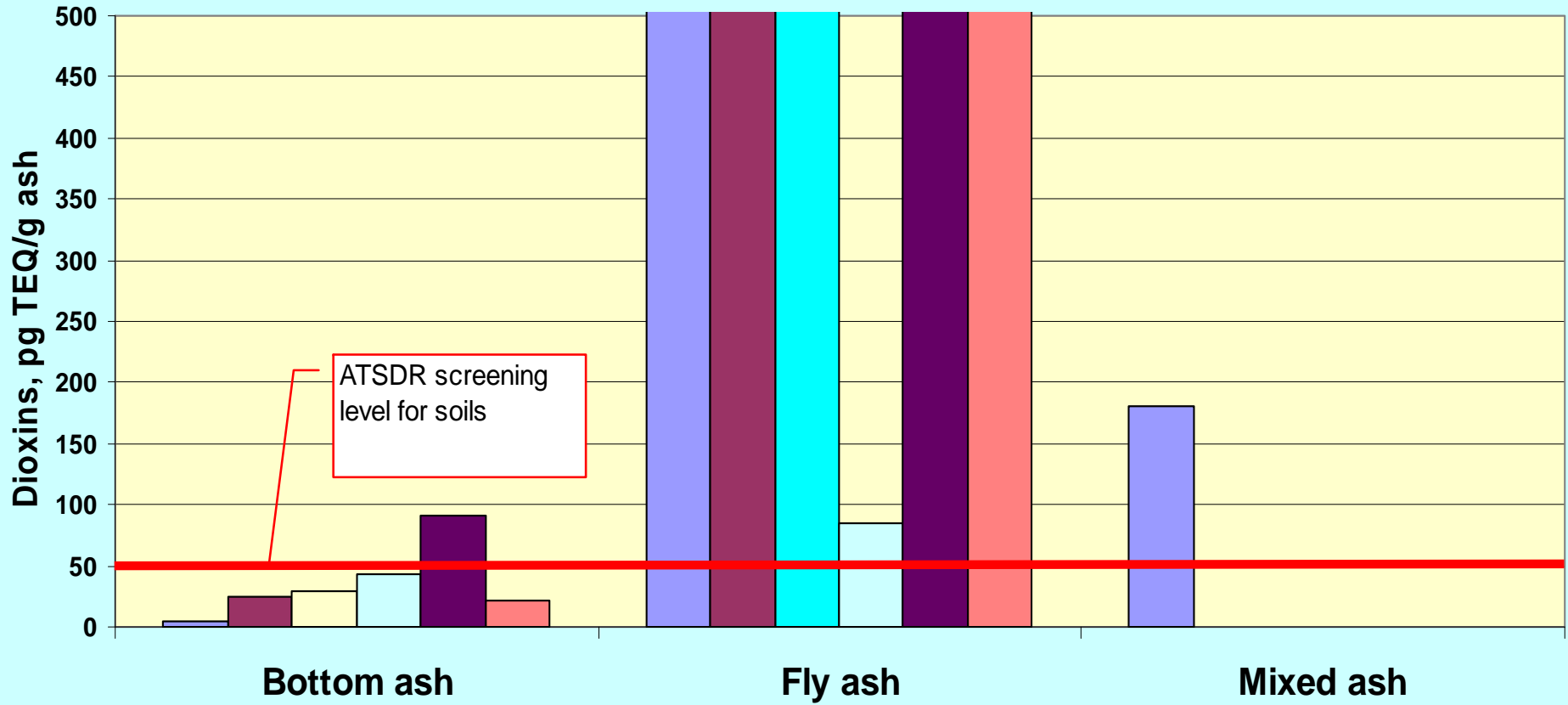
It is now believed that incineration and combustion processes are the most significant sources of chlorinated dibenzodioxins to the environment  
(Zook and Rappe 1994)

90% of exposure is through consumption of food

## Dioxins in incinerator ash (research publications)

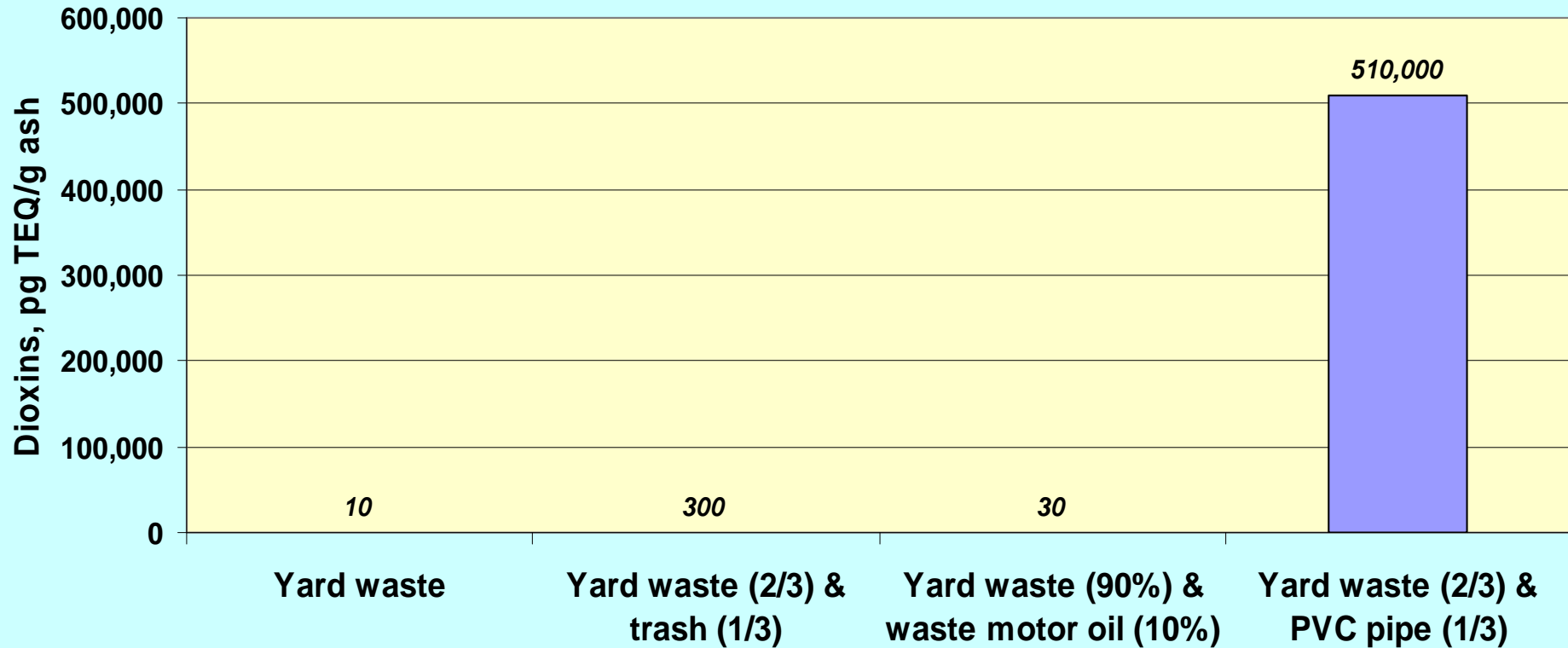


## Dioxins in incinerator ash





## Dioxins leftover in ash: open burning of waste materials



Hedman, B. M. Näslund, C. Nilsson, and S. Marklund (2005) "Emissions of Polychlorinated Dibenzodioxins and Dibenzofurans and Polychlorinated Biphenyls from Uncontrolled Burning of Garden and Domestic Waste (Backyard Burning)," *Environmental Science & Technology* **39**: 8790-96

# Bottom line...

- Marble Quarry site must contain dioxins from incinerator ash & on-site fires
- Dioxins adhere to dust particles – can become airborne when site disturbed
- DEC protocols do not take dioxins into account

# other chemicals of concern: metals

Element	Health Risks
<b>Arsenic</b>	probable human carcinogen
<b>Beryllium</b>	probable human carcinogen; inflammation of lungs, skin
<b>Cadmium</b>	probable carcinogen; diarrhea, kidney damage
<b>Chromium</b>	hexavalent form is carcinogenic
<b>Lead</b>	decreased intelligence, stunted growth, fetal death; possible carcinogen
<b>Mercury</b>	neurotoxin: interferes with brain function
<b>Vanadium</b>	Nausea, mild diarrhea, and stomach cramps ( @ high exposure)
<b>Zinc</b>	an essential nutrient; but high levels are toxic

# Chemicals of concern: PAHs (polynuclear aromatic hydrocarbons)

- 19 types listed by USEPA
- 13 are cancer-causing
- found throughout the site in soils, groundwater
- Sources:
  - petroleum products
  - Formed during combustion