



Air Quality Analysis for PAR1168

Michael Krause
Program Supervisor
Planning and Rules

PAR1168 Working Group

April 17, 2014

Environmental Analysis



- **Air Quality Impacts**

- ❑ Potential secondary impacts from reformulations or replacements (with water or VOC exempt solvents) to comply with new VOC content limits
 - ✓ Anticipated criteria pollutant benefit
 - ✓ Potential adverse toxic impact from VOC-exempt solvents
 - ✓ Potential adverse odor impacts
 - ✓ Corresponding GHG impacts (e.g., reformulation of aerosol or foam products)
- ❑ If significant, required to apply all feasible mitigation to reduce to less than significant

- **Hazard Impacts**

- ❑ Potential flammability impacts

Toxic Impact Analysis



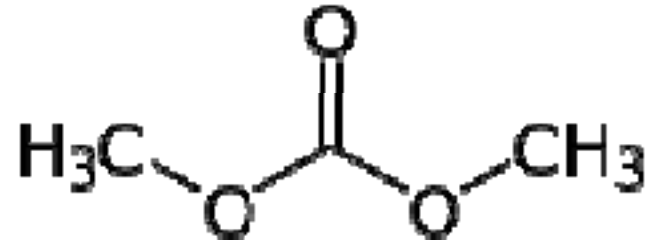
- **Potential Risk**

- Acute (short-term exposure) non-cancer risk
- Chronic (long-term exposure) non-cancer risk
- Carcinogenic cancer risk

- **Receptors**

- Offsite exposure (to resident or worker) – *standard R1401 analysis*
- Onsite worker (“occupational”) exposure
 - ✓ Exposed to indoor source
 - ✓ Exposed to outdoor source

Dimethyl Carbonate (DMC)



- OEHHA review of toxicology of DMC (2012)
- No Threshold Limit Value (TLV) for worker exposure to DMC
- Insufficient data available for Relative Exposure Level (REL)
- No carcinogenicity or long-term toxicity data on DMC
- Metabolizes (breaks down) in the body to methanol
 - ❑ Acute REL = 5 ppm
 - ❑ Chronic REL = 3 ppm
 - ❑ No human evidence for carcinogenicity

Onsite Exposure



- **Commercial/Professional User**

- ❑ Short-term and long-term exposure
- ❑ Rely on OSHA enforceable PEL (200 ppm for metabolite methanol)
- ❑ Scenario of 100-500 gal/day application on 10,000 sq ft roof
- ❑ Less than OSHA PEL; less than significant impact

- **Consumer User**

- ❑ Typically low volume
- ❑ Short-term (acute) exposure
- ❑ Subject to more health protective OEHHA REL (*for methanol*)
- ❑ Acute REL = 5 ppm
- ❑ Could meet limit depending on realistic hourly/daily usage

Offsite Exposure



- **Off-site residential receptor**

- ❑ Short-term exposure
- ❑ OEHHA REL (*for methanol*)
- ❑ Acute REL = 5 ppm
- ❑ Factors that affect the concentration at receptor
 - ✓ Weight fraction in formulation
 - ✓ Usage amount
 - ✓ Area coverage
 - ✓ Distance from source

Other Formulation Compounds



- Found in both existing and reformulated adhesives
 - Methylene diphenyl diisocyanate (MDI) and toluene,-2-4-diisocyanate (TDI)
 - ✓ Pending a review of a study on free monomers during reactivity
 - Ammonia, formaldehyde, vinyl acetate
 - ✓ Trace amounts (*found in MSDS*)