# OEHHA's Guidelines Revision

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# What is AB-2588 Risk Assessment?

- AB-2588 risk assessment is a way of estimating public health risks from stationary facilities.
- Stack chemical emissions are estimated from previous data, or sometimes measured.
- A computer program uses meteorological data to estimate ground level air concentrations and soil concentrations.
- Exposure assessment is used determine the amount of the chemical that is taken into the body (dose).
- OEHHA has developed cancer potency factors, acute and chronic Reference Exposure Levels that allow estimation of cancer and noncancer risk to the surrounding community from a given dose.

# Air Risk Assessment Uses

- Pollution control and permitting decisions can be made by the Air Districts and the Air Resources Board based on this information.
- Stationary facilities can be prioritized and pollution control strategies can be mandated (e.g.  dry cleaners, diesel engines and chrome platers).
- Resources can be directed to the areas where the greatest public health benefits can be obtained.

# Risk Assessment and Risk Management are Separate

- OEHHA as a independent scientific office evaluates chemical risk.
- This helps ensures that the scientific evaluation of risk remains separate from the political process.

# Guidelines Revision

- OEHHA completed our last update of the risk assessment guidelines in 2003.
- In recent years there has been a far greater appreciation that children can be more susceptible than adults to adverse chemical effects.
- SB-25 (1999) mandated OEHHA to ensure that our risk assessment guidelines  are protective of children.

# Guidelines Revision

- Air Toxics Hot Spots Program Technical Support Document for the Derivation of Noncancer Reference Exposure Levels was completed in 2008.
- This document incorporated changes in risk assessment science as well as new information on the greater susceptibility of children.

# Noncancer Guidelines

- Chronic  Reference Exposure Levels (RELs) are air concentrations that the general public can exposed to for 24 hours a day for a significant fraction of a lifetime without  noncancer  adverse health effects.
- Acute RELs are air concentrations that the general public can be infrequently exposed to for 1 hour without noncancer adverse health effects.

# Noncancer Guidelines

- 8-hour REL are air concentrations that the general public can be repeatedly exposed for 8-hours a day for a significant fraction of a lifetime without adverse health impacts.
- There are two types of 8-hour RELs for some chemicals;  one for the entire general population and one that would be protective of adults.
- These 8-hour RELs are  a new type of health standard with this update of the noncancer guidelines.

# Noncancer Guidelines

- The RELs are based on the principle that there is an air concentration (or dose) below which noncancer health effects will not be seen.
- People encounter this in their daily lives when they take aspirin; two aspirin helps a headache but taking a half a bottle at one time is likely to be lethal.
- Scientific data are not available to determine the air concentration where health effects would start to be seen in the population.

# Noncancer Guidelines

- Therefore uncertainty factors are applied to address variability in the human population, the uncertainty of applying animal studies to humans, etc.
- This helps ensure that REL value will be below-and likely well below-an air concentration where health effects will be seen in the general population.

# Noncancer Guidelines

- Therefore, exceeding a chronic Reference Exposure Level does not mean that health effects will occur in the community; it means that margin of safety has been eroded.
- RELs for seven chemicals have been completed under the new guidelines.
- The process will continue until all chemicals have been re-evaluated and more will probably be added.
- RELs can be unchanged, lowered or in some cases increase, under the new guidelines.

# Cancer Guidelines Revision

- Air Toxics Hot Spots Program Technical Support Document for Cancer Potency Factors was completed in June of this year.
- Children ages 0-2 are 10x more susceptible to cancer causing chemicals than adults.
- Children 2 to 15 are 3x more susceptible to cancer causing chemicals than adults.
- The bottom line is that lifetime cancer risk (0-70 years)goes up about two fold even before the higher exposures of children are considered.

# Cancer Risk does not have a Threshold

- There is not a dose or lifetime average air concentration below which there is no risk, as with noncancer health effects.
- The cancer potency factor for a given chemical relates a lifetime average air concentration, or dose, to a risk of excess cancer.
- Cancer is usually expressed as chances in a million.
- A 1 x 10-6 cancer risk is a one in a million risk.
- If a million people are exposed a certain air concentration over a lifetime , one addition cancer case would be expected.

# Exposure Assessment

- Most air pollutants are gases and therefore the only way people can be exposed is through breathing them in.
- A small group of chemicals; dioxins and furans, polycyclic aromatic hydrocarbons (PAHs), heavy metals (e. g lead), and polychlorinated biphenyls (PCBs) can also be deposited into the soil and therefore humans can be exposed through some of the other pathways on the next slide.

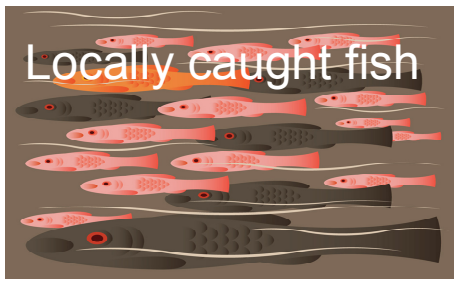

air

Multi pathway Exposure

water

Inhalation






Ingestion


Locally raised
dairy products

Dermal
absorption

Home grown
fruits and
vegetables

Locally raised
meat

# Exposure Assessment

- Exposure assessment requires estimating, for example, the amount that people breath, the amount of soil they accidently eat, the amount of produce consumed, the amount of mother's milk that an infant consumes, etc.
- OEHHA is in process of completing this final step and that must occur before the child protective cancer guidelines can be implemented.

# Exposure Assessment

- Estimates of breathing rates etc for different age ranges are needed 0<2, 2 to 15, and 16 to 70.
- These age ranges are different than our previous age ranges.
- The revised Exposure Assessment Guidance must go out for a 30 to 60 public comment period.

# Approval Process

- All of our Risk Assessment Guidance must be reviewed and approved by the Scientific Review Panel.
- The Scientific Review Panel is an independent body composed of UC professors from various disciplines.
- The time frame for approval is not completely predictable but should occur within the next 12 months or so.

# How Much Will the New Guidelines Change Risk Estimates?

- Estimates of noncancer risk (RELs) will change on a chemical-by-chemical basis , over time as old RELs are re-evaluated and new chemicals are added.
- Estimates in general for noncancer risk will tend to be somewhat higher.
- Estimates of cancer risk will go up somewhere between 2 and 3 times the current risk estimates.
- Cancer risk is often, but not always , the risk of most concern because significant cancer risk occurs at lower chemical concentrations (although not all chemicals cause cancer).

# Limitations of Risk Assessment

- The toxicological database is often inadequate.
- There is missing data on individual chemicals because of limited testing requirements for existing and new chemicals.
- There is uncertainty in using animal data to predict risk in humans.
- Chemicals can interact in ways that we cannot completely predict.
- Risk assessment can be manipulated and often the methods and results are not transparent and therefore the community is not trustful.

# Limitations of Risk Assessment

- The role that chemicals may play in causing asthma and triggering asthma attacks needs considerably more research.
- Odors are not currently addressed by risk assessment.
- Odors can cause headache, nausea, fatigue and other symptoms at concentrations where classic noncancer health effects (e.g. liver damage) are not known to occur.
- The tool has been applied on a facility by facility basis without considering the big picture.

# Cumulative Impacts

- About 80% of the cancer risk in urban areas is due to mobile sources (mainly diesel exhaust).
- Background risks in the Bay Area from widely dispersed air pollution is in the 400 to 500 in a million range.
- There are hundred to thousands of different chemicals at low levels in urban air and the combined impacts noncancer impacts are not well predicted by current science.
- Factors such as diet, immune status, lack of health care can affect susceptibility.

# Summary

- Risk assessment and risk management are typically conducted by different agencies.
- The risk manager uses the information provided by the risk assessor to make risk management decisions.
- OEHHA's new risk assessment guidance for the Hot Spots program will significantly affect risk estimates.