Public Meeting: Discuss ARB Guidelines for Rail Yard Health Risk Assessments

August 30, 2006
(Commerce, CA)

California Environmental Protection Agency
Air Resources Board
Overview of Presentations

• Statewide Locomotive and Railyard Strategies
• Statewide Railyard Agreement
• Railyard Health Risk Assessments (HRAs)
• Guidelines for Railyard HRAs:
  – Emission Inventories (guidelines)
  – Air Dispersion Modelling
  – Health Risk Assessments (guidelines)
• Air District Participation
• Summary and Next Steps
Statewide Locomotive and Railyard Strategies

- South Coast Locomotive Agreement (1998)
- Statewide Railyard Agreement (2005)
- ARB Cargo Handling Equipment Regulation (2005)
- National rulemaking for Tier 3 locomotives (2007)
- Greater than 90% reduction in diesel PM and NOx by 2020 and localized risk reduction
Statewide Railyard Agreement

- Limit non-essential idling to 60 minutes.
- Install anti-idling devices.
- Use ultra-low sulfur diesel fuel.
- Identify and repair smoking locomotives.
- Reduce locomotive diesel PM by 20% in and around rail yards.
Statewide Railyard Agreement (cont’d)

- 16 new railyard risk assessments by 2008.
- Additional mitigation measures in the future.
Railyard HRA Responsibilities

- The Railroads (with their consultants)
  - 80% work within yards
  - Railyard emission Inventory
  - Railyard air dispersion modeling

- ARB
  - Review of emissions and modeling
  - Emissions/Modeling outside of the yards
  - Risk assessments
  - Draft HRA reports
RAILYARD EMISSION INVENTORY GUIDELINES
Railyard Emission Sources

- Locomotives (line-hauls, switchers, & passenger)
- Cargo handling equipment (e.g. forklifts)
- Off-road equipment (e.g. transport refrigeration units)
- On-road trucks & vehicles (e.g. container delivery trucks)
- Stationary Sources (point & area)

Railyard Emission Inventory
Methodology of Emission Inventory

- Fleet/Equipment population
- Operation activities
  - Operation hours
  - Vehicle mileage traveled
  - Daily activity hours
- Emission factors
- Fuel characteristics
  - Fuel usage
  - Sulfur content
Locomotive Emissions

- Population of locomotives by classes or groups
- Notch or power settings & idling
- Emission factors
- Hours of operation
- Fuel consumption
Cargo Handling and Off-Road Equipment Emissions

• Population of equipment
• Emission factors by size and model year
• Activity hours
On-Road Truck/Vehicle Emissions

- Number of trucks and vehicles
- Emission factor per mileage traveled
- Vehicle mileage
- Idling emission and hours
Stationary Source Emissions

- Number of sources (point and area)
- Emission factors
- Fuel consumption
Spatial Distribution of Emissions

UP J.R. Davis Yard, Roseville
Off-Site Emission Assessment

- Off-site emissions
- Off-site modeling
- Part of health risk assessment
Introduction

- Rail Yard Health Risk Assessment (HRA) Guidelines
- Identify the risks associated with toxic air contaminants (TACs), especially diesel particulate matter (DPM)
Introduction

- **Air Dispersion Modeling**
  - Emission inventory inputs
  - Meteorological inputs
  - Computer model $\rightarrow$ TAC concentration distributions

- **Health Risk Assessment**
  - Concentration distributions $\rightarrow$ health impacts
  - 70-year-exposure for residents
  - 40-year-exposure for workers
Flow Chart of Railyard HRA

- Meteorological Inputs
- Railyard Emission Inventory
- Air Dispersion Modeling
- Off-site Emission Inventory
- Risk Assessment
- Draft HRA Report
Meteorological Inputs
Air Dispersion Modeling

- **Recommended model:** AERMOD
- **Other acceptable models:** ISCST3, CALPUFF, etc., on a case by case basis.
Risk Assessment

- Consistent with OEHHA HRA Guidelines and ARB Roseville Railyard Study.
- Estimate cancer risk, non-cancer chronic and acute health impacts.
Risk Assessment
Similarities with SCAQMD Rule 3503

- Railyard Emission Inventories
- Railyard Health Risk Assessments
<table>
<thead>
<tr>
<th>Components</th>
<th>ARB Railyard HRA Guidelines</th>
<th>SCAQMD Rule 3503</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable railroads</td>
<td>Only class I railroads (UP and BNSF)</td>
<td>Includes class I and two class III railroads</td>
</tr>
<tr>
<td>Completion of activity data sets</td>
<td>Annual operations and equipment activity data for the most current complete calendar year on an hourly basis</td>
<td>Extrapolation of a period of three months could be used to develop an annual emissions estimate</td>
</tr>
<tr>
<td>Actual activity data vs. average operating mode (AOM)</td>
<td>Actual activity data is preferred, AOM is allowed only if no actual activity data is available</td>
<td>AOM is allowed if operation is in a pattern that is predictable and repetitive</td>
</tr>
<tr>
<td>Di Minimis levels</td>
<td>ARB approval on case by case basis</td>
<td>OEHHA guideline: degree of accuracy</td>
</tr>
<tr>
<td>Air dispersion model selection</td>
<td>AERMOD, (ISCST3, CALPUFF on a case by case basis)</td>
<td>ISCST3</td>
</tr>
<tr>
<td>Meteorological data</td>
<td>Surface + Upper air sounding data required by AERMOD</td>
<td>Surface data required by ISCST3 and suggested by SCAQMD</td>
</tr>
<tr>
<td>Receptor grids</td>
<td>50X50m within 1 km, 500X500m outside, 250X250m in between</td>
<td>100X100m or less</td>
</tr>
<tr>
<td>Demographic data</td>
<td>US census data in a GIS map</td>
<td>Not required</td>
</tr>
<tr>
<td>Exposure duration</td>
<td>70 years for residents, 40 years for workers, in addition, 9 years particular for school children</td>
<td>70 years for residents, 40 years for workers</td>
</tr>
<tr>
<td>Emissions from other sources surrounding railyard</td>
<td>Risk associated with significant offsite emissions will be estimated (including emission inventory, air dispersion modeling, and risk assessment)</td>
<td>Not considered</td>
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</tbody>
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## Railyard Health Risk Assessment Schedules

<table>
<thead>
<tr>
<th>Railyard</th>
<th>Company</th>
<th>Railyard</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Draft Health Risk Assessments to be Completed by December 31, 2006</strong></td>
<td></td>
<td><strong>December 31, 2007</strong></td>
<td></td>
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<tr>
<td>Commerce/Eastern</td>
<td>BNSF</td>
<td>Barstow</td>
<td>BNSF</td>
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<tr>
<td>Hobart</td>
<td>BNSF</td>
<td>San Bernardino</td>
<td>BNSF</td>
</tr>
<tr>
<td>Richmond</td>
<td>BNSF</td>
<td>San Diego</td>
<td>BNSF</td>
</tr>
<tr>
<td>Stockton</td>
<td>BNSF</td>
<td>Colton</td>
<td>UP</td>
</tr>
<tr>
<td>Watson</td>
<td>BNSF</td>
<td>Dolores/ICTF</td>
<td>UP</td>
</tr>
<tr>
<td>Commerce</td>
<td>UP</td>
<td>Industry</td>
<td>UP</td>
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<td>LATC</td>
<td>UP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mira Loma</td>
<td>UP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton</td>
<td>UP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oakland</td>
<td>UP</td>
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Community Involvement

- Public workshops on Draft ARB Railyard Health Risk Assessment Guidelines:
  - Northern California: 8/28/2006 (Sacramento)
  - Southern California: 8/30/2006 (Commerce)

- Community meetings to discuss draft findings at each designated railyard:
  - Early 2007 (first set of railyard HRAs)
  - Early 2008 (second set of railyard HRAs)

- Additional discussions on mitigation measures for each designated railyard
ARB Railyard HRA Contacts

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- **Eugene Yang**, Ph.D.
  - HRA Emission Inventories
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- **Jing Yuan**, Ph.D.
  - Air Dispersion Modeling and Health Risk Assessments
  - (916) 322-8875; jyuan@arb.ca.gov

- **ARB Railyard HRA Website:**
  - http://www.arb.ca.gov/railyard/hra/hra.htm