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Gasoline Service Station Industrywide Risk Assessment Guidance Virtual Workshop

October 13, 2021
5 p.m. to 7 p.m.

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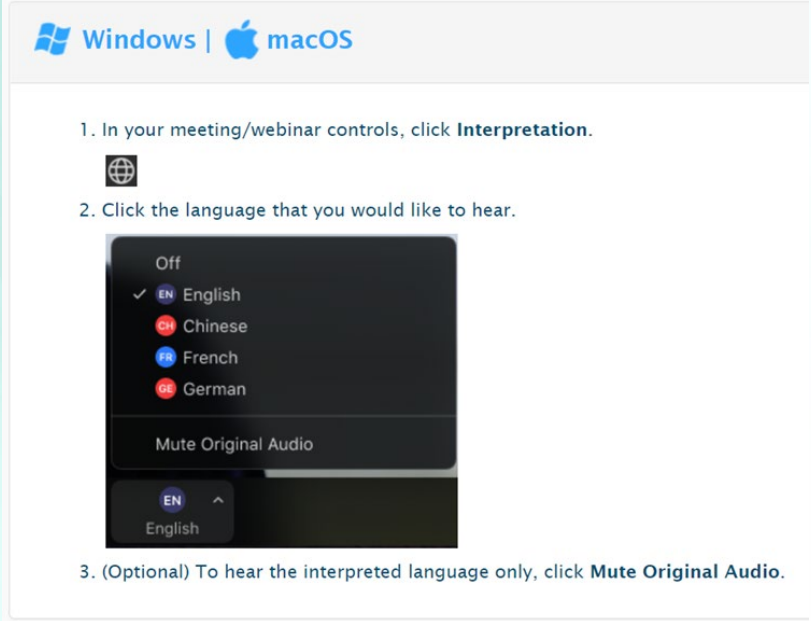

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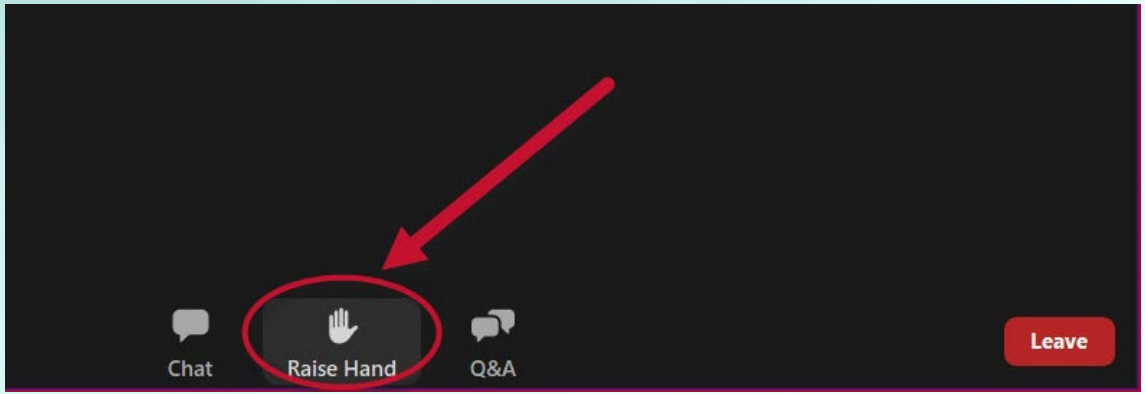

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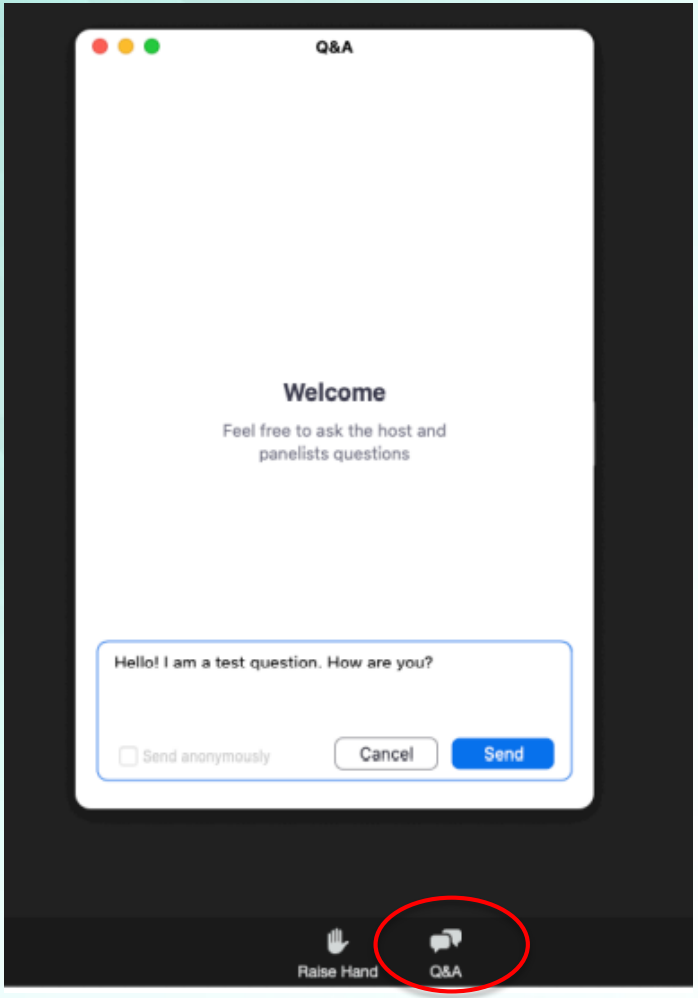

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Agenda

- Part 1 – 5 p.m. to 6 p.m.
  - CAPCOA/CARB Technical Guidance
  - Screening Tools
  - Q&A
- Part 2 – 6 p.m. to 7 p.m.
  - CARB Supplemental Policy Guidance
  - Q&A

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Part 1:
CARB & CAPCOA Gasoline Service Station Industrywide Risk Assessment Technical Guidance

Purpose of the Technical Guidance

- Establish a statewide, cost-effective, and uniform method for preparing emissions inventories and risk assessments to meet the requirements of AB 2588 Air Toxics "Hot Spots" Program
- Local Air Districts may use this document for permitting gas stations
- The Guidance is intended to be used as a screening tool to identify potential cancer risks and noncancer health impacts near gas stations

Changes from the 1997 Guidelines

- Updated OEHHA methodology and health factors
- Current U.S. EPA-preferred air dispersion model (AERMOD)
- Updated gasoline speciation profiles
- Updated emission factors based on current control technologies
- Expanded to address short-term non-cancer impacts

What's in the Technical Guidance?

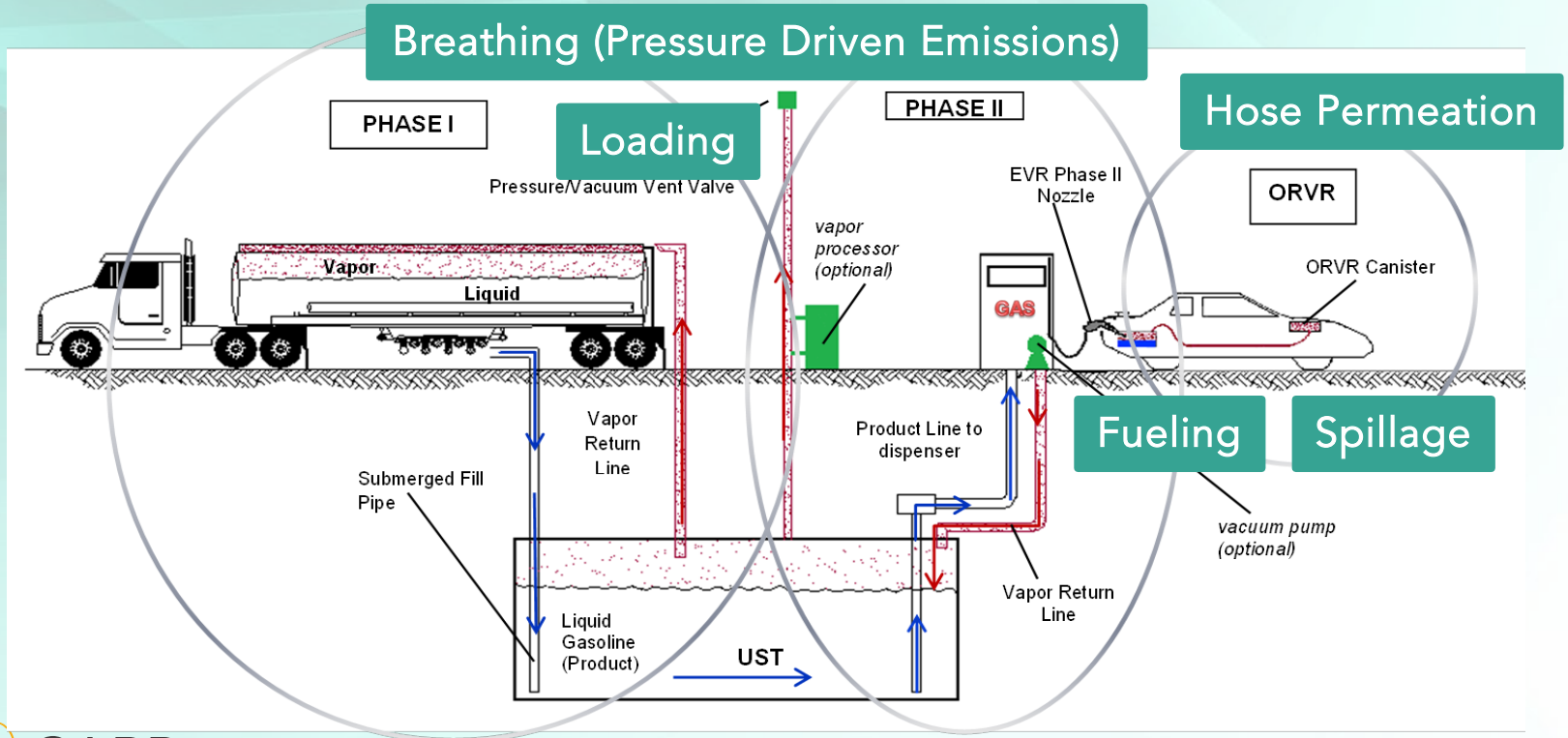
- Executive Summary
- Technical Guidance
- Appendices
  - Modeling Protocol
  - Analysis of Building Downwash
  - Cancer Risk and Acute Hazard Index Tables
- Screening Tools

Modeling Considerations

- Emission Sources
- Generic Facility Configuration
- Scenarios
- Meteorology
- Substances of Interest
- Emissions
- Building Downwash

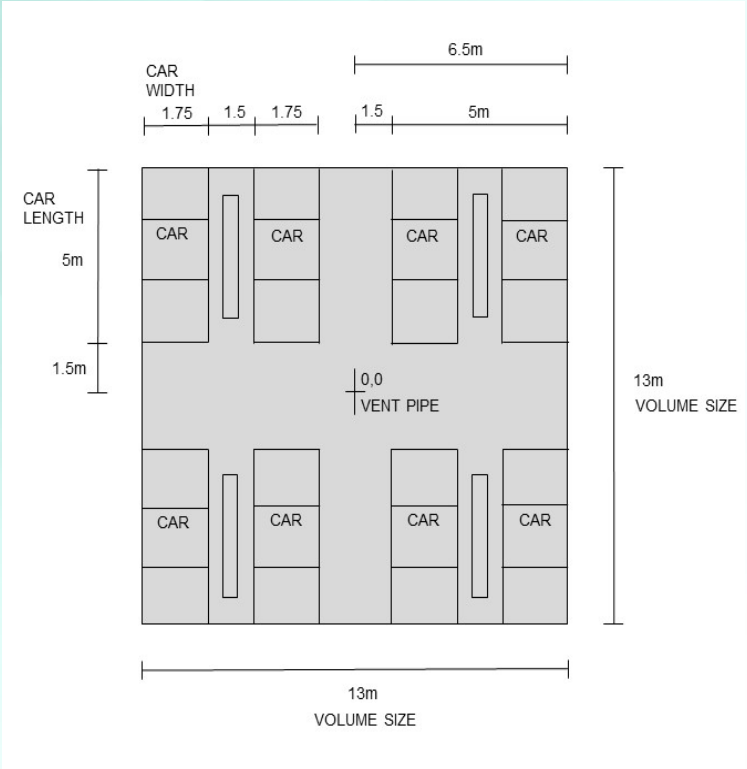
Emission Sources

- 5 emission sources



Generic Facility Configuration & Operating Schedule

- Facility Plot Plan
  - Canopy: 13m x 13m x 4m
  - Four dispensers
  - Eight nozzles
  - Vent Pipe in Center
- Operating Schedule
  - 85% Day, 15% Night



Scenarios

- Seven scenarios

1. EVR Phase I and EVR Phase II (97% of CA gas stations)
2. EVR Phase I and pre-EVR Phase II
3. EVR Phase I only (ORVR vehicles only)
4. EVR Phase I only
5. Pre-EVR Phase I and pre-EVR Phase II
6. Pre-EVR Phase I only (ORVR vehicles only)
7. Pre-EVR Phase I only

Meteorology

- 6 Meteorological Data Sets
  - Urban
    - San Jose
    - Fresno
    - San Diego
    - Ontario
  - Rural
    - Redding
    - Lancaster

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Substances in the Gas Station Guidance

- 7 substances with OEHHA health factors

Substance	Cancer	Acute	Chronic
Benzene	X	X	X
Ethyl Benzene	X		X
n-Hexane			X
Naphthalene	X		X
Propylene			X
Toluene		X	X
Xylenes		X	X

Emissions

- CARB emission factors (December 2013)
- Annual Emissions
  - Expressed in 1 million gallons/year
  - Annual Emissions: 59.2% Summer, 40.8% Winter
- Hourly Emissions
  - Loading emissions: 8,800 gallons/hour
  - Dispensing emissions: 1,000 gallons/hour
  - Hourly Emissions: Summer gas

Building Downwash

- Applied to point sources only
  - Loading and Breathing
- Modeled effects of 10m x 5m x 4m building
- Adjustment Factor Tables

Receptor Distance	Potential Cancer Risk	Non-cancer Acute Hazard Index
0 m – 60 m	1.25	4.25
>60 m – 150 m	1.20	4.85
>150 m – 200 m	1.15	3.90
>200 m – 300 m	1.05	2.05
>300 m	1.00	1.00

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Risk Results - Cancer

- Based on 1 million gallons/year throughput
  - Rural and urban similar downwind
- Cancer Risk Calculation
  - Risk Value from Guidance x (Throughput/1,000,000)
- Example of Scenario 1 table from Guidance:

Grid Distance (meters)^2	Rural		Urban			
	Redding	Lancaster	Fresno	Ontario	San Diego	San Jose
10	8.86	6.07	7.02	7.45	6.40	7.64
20	4.94	3.46	3.85	4.23	3.42	4.55
30	3.15	2.23	2.42	2.72	2.12	2.99
40	2.19	1.56	1.67	1.89	1.46	2.11

Hazard Index Results – Acute

- Acute HI Calculation = Loading HI + Dispensing HI
  - Loading HI = Risk Value from Guidance x (Throughput/8,800)
  - Dispensing HI = Risk Value from Guidance x (Throughput/1,000)
- Example of Rural Scenario 1 table from Guidance:

Grid Distance (meters)[2]	Redding		Lancaster	
	Loading[3] (8,800 gal)	Dispensing[4] (1,000 gal)	Loading[3] (8,800 gal)	Dispensing[4] (1,000 gal)
10	0.55	0.33	0.51	0.33
20	0.35	0.23	0.36	0.25
30	0.26	0.15	0.27	0.18
40	0.25	0.15	0.24	0.16

Hazard Index Results - Chronic

- Chronic HI is very low compared to cancer risk
  - Charts will not be included in Guidance for Chronic HI or 8-hour Chronic HI
- Example of Chronic results:

Grid Distance (meters)^2	Rural		Urban			
	Redding	Lancaster	Fresno	Ontario	San Diego	San Jose
10	0.03	0.02	0.03	0.03	0.02	0.03
20	0.02	0.01	0.01	0.02	0.01	0.02
30	0.01	0.01	0.01	0.01	0.01	0.01
40	0.01	0.01	0.01	0.01	0.01	0.01

Screening Tools

- Screening Tool #1 – Screening Lookup
  - Look-up tool using Guidance modeling results
  - Scale via actual throughput
- Screening Tool #2
  - AERMOD modeling using site-specific meteorology.
  - Allows for some limited customization
- HARP2 input files
  - Provide input files for site-specific modifications

Next Steps

- Public Comment Period – Closes November 6, 2021
- CAPCOA Approval of Technical Guidance – November/December 2021
- Finalize Guidance Documents – December 2021

CARB Staff Contacts – Technical Guidance

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Technical Guidance

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Spreadsheet Tool

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Technical Guidance Q&A

Part 2:
CARB Gasoline Service Station Industrywide Risk Assessment Supplemental Policy Guidance

Purpose of the Supplemental Guidance

- Discusses community-scale health impacts from gas station emissions
- Provides considerations and recommendations for Districts and local governments regarding public policy for gas stations
  - Local governments can address gas station emissions during the planning phase of a gas station
  - Districts conduct health risk assessments (HRAs) and air quality permitting once the planning phase is complete
- Identified in the AB 617 Blueprint to support community engagement on land use and transportation strategies for impacted communities

Overview of the Supplemental Guidance

- Introduction
- Supplemental Policy Guidance
  - Existing public policy
  - Exposure impacts from gas stations
  - Recommendations/considerations to reduce emissions
- Appendices
  - Analysis of Multiple Gas Stations
  - Population-Wide Cancer Risk

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What are Cumulative Impacts?

- Combined effects of air pollution from multiple sources of toxic emissions in close proximity to one another
- Disproportionately affect communities with multiple sources of toxic emissions
- Gas stations are sources of toxic emissions that are typically located within or nearby areas where people live and work

Multiple Source Assessment - Approach

- Modeled the following scenarios in HARP for the most conservative meteorological data sets in the Technical Guidance (Redding and San Jose):
  - A single three-million-gallon gas station
  - A single 12 million-gallon gas station
  - Four three-million-gallon gas stations, modeled at five separation distances (100m, 150m, 200m, 250m, 300m)
- Compared:
  - Point of maximum impact (PMI)
  - The total area exposed to gas station emissions (zone of impact)

Multiple Source Assessment - Findings

- Potential health impacts from multiple gas stations in close proximity to each other can be highly site-specific
- The largest zones of impact occurred at a separation distance of 100m for both the urban and rural scenarios
- The modeling results showed potential cancer risks as high as 30 chances per million
- The zone of impact for four three-million-gallon gas stations can be over 4x larger than the zone of impact of a single three-million-gallon station

PMI Results (chances per million)		
	Single 3-million gallon station	Four 3-million gallon stations
Rural	26	27 to 29
Urban	20	21 to 23

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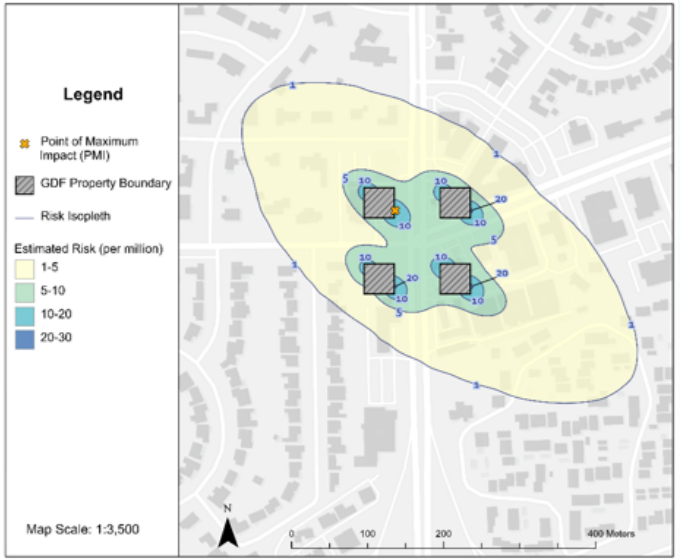
Multiple Source Assessment - Findings (continued)

- Example Zone of Impact Maps

Figure A4. Zone of Impact of Gas Station Emissions: Single Three-Million-Gallon Gas Station (Urban)[1,2]

Figure A6. Zone of Impact of Gas Station Emissions: Four Three-Million-Gallon Gas Stations with 100m Separation (Urban)[1,2]



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Recommendations for Air Districts

- CARB recommends that Districts:
  - Evaluate population wide health impacts for gas stations requiring site-specific assessments
  - Consider cumulative impacts in air quality permitting decisions
  - Consider all control strategies available to reduce community exposures to gas station emissions
  - Collaborate with gas station operators on ways to minimize emissions from new and existing gas stations

Recommendations for Local Governments

- CARB recommends that Local Governments:
  - Consider cumulative impacts in siting and permitting decisions
  - Ensure areas around gas stations are properly zoned to avoid or minimize air quality impacts
  - Include mitigation measures to avoid or reduce air quality impacts as conditions of approval

Next Steps – Supplemental Policy Guidance

- Public Comment Period – Closes November 6, 2021
- Finalize Guidance Documents – December 2021

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Supplemental Policy Guidance Q&A

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