SNAPS
Baldwin Hills

Knox Presbyterian Church: February 11th, 2020
Culver City Senior Center: February 12th, 2020
• Background and Scope

• Stationary Monitoring and Potential Monitoring Sites

• Mobile Monitoring

• Health Analysis
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• Mobile Monitoring

• Health Analysis
Study of Neighborhood Air near Petroleum Sources

- Study air quality in neighborhoods
- Select neighborhoods close to oil and gas extraction facilities
- Characterize cumulative impact from surrounding sources
First Round Communities

1. Lost Hills

2. Baldwin Hills

3. South Los Angeles

McKittrick/ Derby Acres
Motivation

- Exposure concerns raised by communities
- California Council on Science and Technology (CCST) recommendations
- Aliso Canyon underground natural gas storage leak
- Part of broader CARB effort to understand impacts of oil and gas operations
## Scope

### Program Goals
- Characterize air quality in communities near oil and gas operations
- Identify emission sources as feasible
- Analyze data for possible health risks

### Major Pollutants
- **Toxic Air Contaminants (TACs)**
- **Criteria Pollutants**
  - Particulate Matter (PM$_{2.5}$)
  - Carbon Monoxide (CO), Ozone (O$_3$)
- **Volatile Organic Compounds (VOCs)**
- **Methane (CH$_4$)**
- **Hydrogen Sulfide (H$_2$S)**
- **Metals**
- **Glycols**
## Data Availability

### Measurement

<table>
<thead>
<tr>
<th>Instrumentation</th>
<th>Pollutants</th>
<th>Time to Public Posting of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site</td>
<td>CH$_4$, H$_2$S, O$<em>3$, CO, PM$</em>{2.5}$, black carbon (BC)</td>
<td>Hourly</td>
</tr>
<tr>
<td>Discrete Samples</td>
<td>Toxic air contaminants (TACs), non-TAC VOCs and metals</td>
<td>With published report</td>
</tr>
</tbody>
</table>

- Results streamed hourly on project website
- Report published following the completion of monitoring
Website Real-time Data Display

Air Monitoring Snapshot

Air Quality Index (AQI)

Hourly AQI (combined \( PM_{2.5} \) and \( O_3 \)) for the SNAPS measurement site(s) and nearby regional air monitoring stations are shown below (AQI, see AirNow for more information and full calculation methods). A description of AQI colors and values are shown in the table.

![AQI Chart](https://ww2.arb.ca.gov/our-work/programs/study-neighborhood-air-near-petroleum-sources/snaps-data-display)

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Google search: “SNAPS data display”
• Background and Scope

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Comprehensive instrumentation

Capability to monitor over 200 pollutants
Site Selection Process - Baldwin Hills

1. Hold community meeting(s) for input on potential monitoring sites
2. Ensure sites meet technical and logistical requirements
3. Create short-list of monitoring sites
4. Present short-list to community
5. Finalize monitoring sites
6. Establish agreements with the final selected sites
7. Begin air monitoring and host kickoff meeting
Stationary Site Logistical Requirements

• Power
  • (1) dedicated 220 v/50 Amp circuit & (2) dedicated 120v/20 Amp circuits

• Security
  • Examples include: built-in fencing, security cameras, locked gate

• Space
  • Approximate flat footprint area of the trailer is 24’ x 36’
  • Potential height of meteorological equipment mast up to 30’

• Site Access
  • Regular access during business hours for maintenance and operations
Potential Monitoring Sites

- CARB is planning to locate monitoring equipment at 2 sites
  - Prospective site on edge of oilfield (near Kenneth Hahn State Recreation Area)
    - Sentinel Peak Site 1
  - Prospective site east of oilfield
    - Hillcrest Drive Elementary School
  - Potential sites west of oilfield
    - Marycrest Manor
    - Sentinel Peak Site 2 (western edge of oilfield)
Potential Site On Edge of Oilfield

**Sentinel Peak Resources Site 1**

- Can assess community exposure for Kenneth Hahn State Recreation Area users
- East-northeast of gas processing plant and several tank farms
- Will help gather ambient air quality data near pollution sources
- Meets technical and logistical requirements
Potential Site East of Oilfield

- WSW Prevailing Wind Direction

Hillcrest Drive Elementary School

- ~1 mile east-northeast of Inglewood Oil Field
- Located in community, with potential to collect data from numerous pollution sources
- Can assess community exposure
- Meets technical and logistical requirements
Marycrest Manor

- Located between Culver City and the central and western portions of the Inglewood Oil Field
- West-southwest of gas processing plant and tank farms
- Will capture data near a residential area
- Meets technical and logistical requirements
Potential Site West of Oilfield: Option 2

Sentinel Peak Resources Site 2

- Located on northwestern edge of the Inglewood Oil Field, adjacent to West LA College
- Will capture near-source as well as community-level data
- West-southwest of several storage tanks
- Meets technical and logistical requirements
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• Health Analysis
SNAPS Mobile Monitoring Platform

Mobile Monitoring between 8.30am and 11am on September 4th
Mobile Monitoring

• Instruments housed within a vehicle
  • Measures methane and hydrogen sulfide every second
  • BTEX (benzene, toluene, ethylbenzene, xylenes) measurements every 15 minutes

• Monitoring along public roadways in and around Baldwin Hills

• Measurements are ‘snapshots’ in time
  • Multiple passes on streets of Baldwin Hills and surrounding communities
  • Includes upwind and downwind measurement periods
Wonderful Park
SNAPS Monitoring
Trailer
Lost Hills
School
Interstate 5
Lost Hills California
Route 46

Methane concentrations varied around Lost Hills across space and time.

Example: Lost Hills Methane Mobile Monitoring (Oct 1st)

Measurement Time: 6:25 – 7:38 am

**Data are preliminary. Final results will be published in the final report.**
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Risk = Toxicity \times Exposure

How dangerous is the chemical? How dangerous is the chemical?

Air monitoring data

Does chemical contact or enter our body? Health Guidance Values

Air monitoring data

Health Guidance Values
How do we determine the toxicity?

OEHHA develops benchmarks for toxicity called Health Guidance Values

• Noncancer Reference Exposure Levels
  o Amount of chemical in air that is not likely to cause noncancer health effects
  o For short- and long-term exposures

• Cancer Health Guidance Values
  • Describe how cancer risk increases as exposure increases
  • For long-term exposure
What influences toxicity?

- Amount
- Length of exposure (time)
- Sensitivity

https://www.meadindoormeetphysicians.com/
Toxicity depends on the duration of exposure

OEHHA develops Reference Exposure Levels for specific amounts of time

- Brief exposure (acute): occasional 1-hour exposures
- Moderate exposure: repeated 8-hour exposures over a significant fraction of a lifetime
- Constant exposure (chronic): continuous exposures from 1 year to a lifetime

https://accesspharmacy.mhmedical.com/content.aspx?bookid=2462&sectionid=194918140
How do we determine risk from a chemical in air?

**Noncancer**
How does the amount in air compare to the Reference Exposure Level?

- Higher? May be some concern
- Reference Exposure Level
- Lower? Little concern

**Cancer**
How much does the amount in air increase cancer risk by?

- Higher? Concern
- Lower? Less concern

Reference Exposure Level
Moving Forward

• Continue monitoring in Lost Hills while site lease is active

• Finalize Baldwin Hills monitoring site selection

• Locate monitoring equipment in Baldwin Hills, currently anticipated for Summer 2020

• Hold kickoff meeting once monitoring begins near Inglewood Oil Field

• Monitor air quality for approximately six months-one year