



DISPROPORTIONATE IMPACTS OF OIL AND GAS EXTRACTION ON ALREADY “DISADVANTAGED” CALIFORNIA COMMUNITIES: HOW STATE DATA REVEALS UNDERLYING ENVIRONMENTAL INJUSTICE

PA11B-0942

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Introduction

The consensus is that global warming must be limited to 1.5°C to prevent profound environmental harms, and to do so will require reaching net zero CO₂ emissions globally by 2050. This sets the imperative to rapidly phase out fossil fuel production and use, since continued fossil fuel use is inconsistent with emissions reduction goals. Meanwhile, it has been found that living in close proximity to fossil fuel infrastructure can have adverse impacts on human and environmental health, with these impacts often falling disproportionately on low-income and communities of color. Such environmental injustice further sets the imperative for fossil fuel phase out. California serves as an example, with data from the CA Division of Oil, Gas, and Geothermal Resources (DOGGR), data from the CA South Coast Air Quality Management District (SCAQMD), and CalEnviroScreen data all indicating undue environmental burdens placed on low-income and communities of color. It is proposed that, in order to alleviate the environmental justice concerns around oil and gas extraction, low-income communities and communities of color be prioritized in enacting measures to phase out fossil fuel extraction and use.

Methods

Oil and Gas Wells Approved by Gov. Brown in Low-Income or Communities of Color

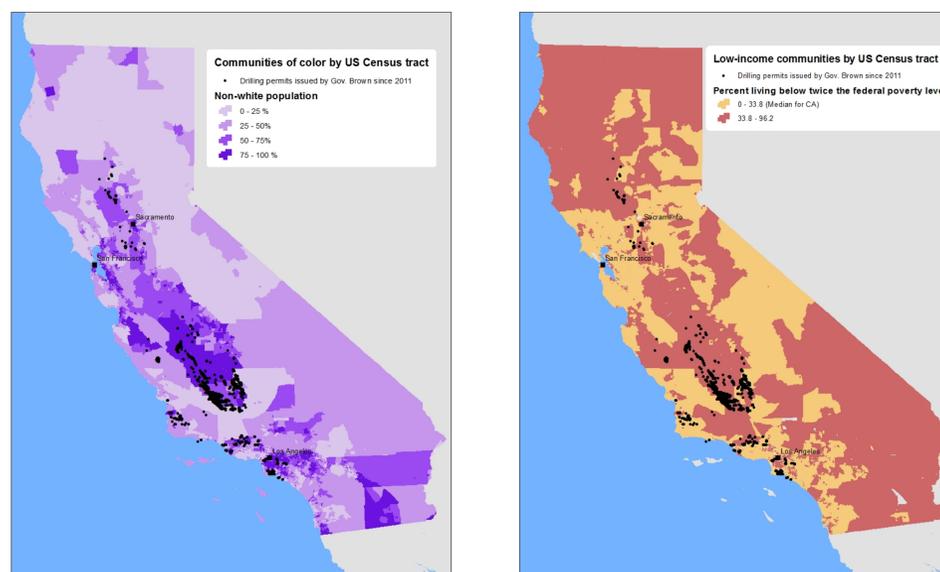
- Using DOGGR well permitting data, it was determined how many oil and gas well drilling permits were issued during Gov. Brown's tenure from 2011 to 2018.
- Low-income and communities of color were defined as communities with a higher-than average percentage of residents living below twice the poverty line and communities with a majority nonwhite population, respectively.
- Using U.S. Census tract data, it was determined where drilling permits were granted relative to low-income and communities of color and mapped using GIS.

Oil and Gas-Related Air Toxic Chemical Usage in Urban Los Angeles County

- Using data which was collected by SCAQMD under Rule 1148.2, requiring oil and gas operators to disclose chemicals used in select oil and gas operations, it was determined the mass and the number of instances of use of air toxic chemicals in Los Angeles county between June 4, 2013 and February 28, 2017.
- An air toxic is defined as a hazardous chemical that can become either a vapor or particles small enough to be transported through the air.
- Chemical usage data was then categorized by zip code, and those zip codes with the greatest chemical usage were labeled with their CalEnviroScreen score.
- The CA EPA's CalEnviroScreen index grants scores to communities based on measures of pollution burden and vulnerability such as poverty level, asthma rates, and air pollution.

Results

Oil and Gas Wells Approved by Former Gov. Brown in Low-Income or Communities of Color



Oil and Gas-Related Air Toxics Chemical Usage in Los Angeles County

Rank	Chemical	CASRN	Number of Times Used	Total Lbs. Used
1	Crystalline Silica	14808-60-7	3,222	46,886,251
2	Methanol	67-56-1	1,622	219,145
3	Hydrochloric Acid	7647-01-0	1,217	20,994,937
4	Formaldehyde	50-00-0	695	79,075
5	Hydrofluoric Acid	7664-39-3	593	10,206,305
6	Naphthalene	91-20-3	554	102,159
7	2-Butoxy Ethanol	111-76-2	522	198,175
8	Xylene	1330-20-7	385	250,238
9	Ethylbenzene	100-41-4	370	120,512
10	Cumene	98-82-8	335	21,828
11	Aluminum Oxide	1344-28-1	277	1,619,464
12	Glutaral/Pentanedial	111-30-8	259	290,752
13	Remaining Air Toxics	--	1,572	17,754,394
Total			11,623	98,743,235

Rank*	Zip Code	Community	Lbs. of air toxics used	CalEnviroScreen Score*
1	90802	Long Beach	48,271,904	80.2
2	90056	Ladera Heights	12,242,946	58.9
3	90744	Wilmington	5,513,548	94.3
4	90813	Long Beach	3,552,481	96.1
5	90670	Santa Fe Springs	3,501,947	93
6	90755	Signal Hill	3,440,721	78.6
7	90640	Montebello	1,225,214	86.5
8	90048	West Hollywood	1,210,425	54.8
9	90018	Jefferson Park, Leimert Park	377,147	91.1
10	90710	Harbor City	303,994	75.8

*LA County communities ranked by lbs. of air toxics usage. Communities with CalEnviroScreen scores in the top 25th percentile (score 75+) are designated "disadvantaged communities" by CalEPA.

	Eye Irritation	Respiratory Impacts	Nausea and Vomiting	Central Nervous System or Neurological Impacts	Reproductive Harm	Increased Cancer Risk	Chemical is flammable or explosive	Other
2-Butoxy Ethanol	✓	✓					✓	Chronic occupational exposure associated with hematuria
Aluminum Oxide	✓	✓	✓	✓				
Crystalline Silica	✓	✓				✓		Occupational exposures are associated with the development of silicosis, lung cancer, pulmonary tuberculosis, and other serious impacts to lung function.
Cumene	✓	✓		✓		✓	✓	Exposure may cause dizziness, headache, or unconsciousness. Evidence of carcinogenic activity in rats.
Ethylbenzene	✓	✓		✓		✓	✓	Animal studies have reported hearing effects and kidney damage with exposure to low levels.
Formaldehyde	✓	✓		✓		✓		Even very low-dose inhalation exposure can result in headaches and difficulty breathing; high dose exposure may cause severe mucous membrane irritation, burning, and lower respiratory effects such as bronchitis. Sensitive individuals may experience asthma even at very low concentrations.
Glutaral/Pentanedial	✓	✓	✓					Repeated exposure may cause asthma.
Hydrochloric Acid	✓	✓	✓				✓	Highly corrosive — acute inhalation may cause pneumonitis, lung edema, or even death in extreme cases. Repeated exposure may cause reactive airways dysfunction syndrome (RADS).
Hydrofluoric Acid	✓	✓		✓			✓	High levels of exposure may cause lung edema and damage heart.
Isopropanol	✓	✓		✓			✓	Acute exposure may result in persistent or recurring headaches, impaired vision, or even permanent motor dysfunction.
Methanol	✓	✓	✓	✓	✓		✓	Exposure to high concentrations may cause hemolytic anemia. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation.
Naphthalene	✓	✓		✓		✓	✓	Cardiovascular and kidney effects have also been reported.
Xylene	✓	✓		✓	✓		✓	

Conclusions

- DOGGR approved 21,397 new wells between Jan. 1, 2011 and April 14, 2018. Seventy-six percent are located in communities with above-average poverty rates for CA, and 67 percent are located in communities of color.
- 77% of the permits for new oil and gas wells issued under Brown from 2011 to 2018 are in communities with a higher-than-average percentage of residents living below twice the poverty line and/or communities with a majority nonwhite population.
- Oil companies used more than 98 million lbs. of chemicals known to cause serious health problems in Los Angeles County between 2013 and 2017.
- Over 30% of the 1,140 well-stimulation operations using air toxics occurred within 1,500 feet of at least one hospital, preschool or residence in Los Angeles County. One well-stimulation event occurred within 12 feet of a home and another within 200 feet of a hospital.
- Eleven of the 15 zip codes with the heaviest air toxics use contain neighborhoods like Wilmington that are considered "disadvantaged" by the CalEPA (Only top ten shown).
- To alleviate the environmental justice concerns around oil and gas extraction, low-income communities and communities of color should be prioritized in enacting measures to phase out fossil fuel extraction and use. This should include enacting a health and safety setback buffer of no less than half a mile protecting homes, schools, and other sensitive sites within which existing wells are shut down first.

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