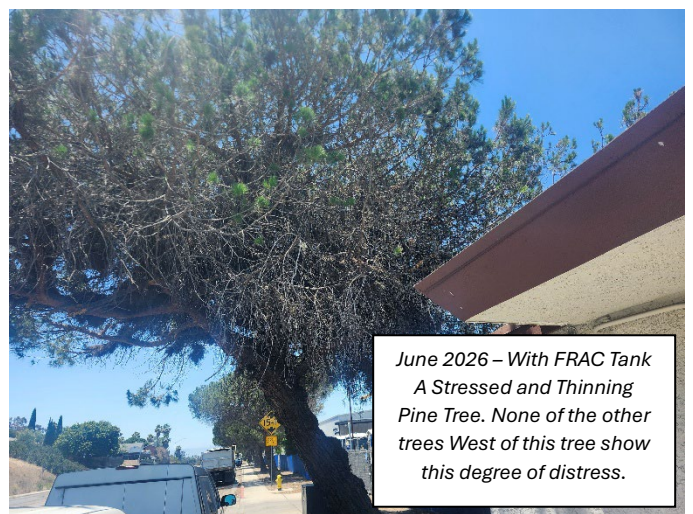


# 6144 Federal Blvd. San Diego, CA Timeline Images

The Before and After Environmental Effects of United Rentals Human Waste Batch Processing in a FRAC Tank as Unregulated Atmospheric Gas, Liquids and Solids Release.



Historical Imagery < Jun 17, 2023 > | 2005 2006 2008 2009 2010 2012



< Feb 11, 2024 > | 2005 2006 2008 2009 2010 2012 2013



# FRAC Tank Off-Gassing & Pine Tree Decline

Environmental Analysis Report — 6144 Federal Blvd., San Diego, CA

## QUESTION POSED:

***What effect, if any, might the off-gassing of gases emitted from the FRAC tank be attributed to the pine tree directly adjacent to the tank, given that the tank has been in service since at least February 2024, as evidenced by the photographic and satellite timeline images from 6144 Federal Blvd., San Diego, CA?***

## 1. Summary of the Visual Evidence

The document presents a compelling chronological photographic and satellite record demonstrating a clear before/after inflection point around early 2024, coinciding with the FRAC tank being placed into service.

Date	FRAC Tank	Tree Condition
April 2007	Absent	Full, healthy, dense canopy
January 2023	Absent	Full, healthy, dense canopy
June 2023	Absent	Row of healthy, full pine trees
February 2024	<b>PRESENT</b>	First satellite evidence of tank in service
June 2026	<b>PRESENT</b>	Visibly stressed, thinning, sparse canopy

## 2. What Is a FRAC Tank and What Does It Off-Gas?

A FRAC (fracturing) tank is a large portable storage vessel used to hold liquids — commonly wastewater, produced water, chemicals, hydrocarbons, or industrial fluids. Depending on stored contents, these tanks can off-gas a variety of volatile compounds, most notably:

- **Volatile Organic Compounds (VOCs)** — benzene, toluene, ethylbenzene, xylene (BTEX compounds)
- **Hydrogen Sulfide (H<sub>2</sub>S)** — a highly phytotoxic gas even at low concentrations
- **Methane and light hydrocarbons**
- **Ammonia** (if storing certain industrial or biological waste streams)
- **Petroleum distillates** depending on the stored material

## 3. Potential Phytotoxic Effects on the Adjacent Pine Tree

### 3a. Hydrogen Sulfide (H<sub>2</sub>S) Toxicity

H<sub>2</sub>S is among the most damaging gases to conifers. Even at concentrations as low as 0.3–1.0 ppm, H<sub>2</sub>S can interfere with cytochrome oxidase in plant cells, disrupting cellular respiration; cause needle chlorosis (yellowing) and premature drop; and produce the kind of progressive canopy thinning visible in the June 2026 images.

### 3b. VOC / BTEX Exposure

Benzene and related aromatics are known to inhibit root uptake of water and nutrients, disrupt stomatal function (reducing photosynthesis), and accumulate in soil around the tank base — creating a root zone contamination zone directly beneath and adjacent to the tree.

### 3c. Soil Pathway — Root Zone Contamination

Perhaps more significant than aerial off-gassing is the soil absorption pathway. If the FRAC tank has experienced any minor seepage, condensate drip, or overflow, volatile hydrocarbons in the soil can displace soil oxygen (suffocating root systems), create anaerobic conditions in the rhizosphere, and directly damage fine feeder roots responsible for water and nutrient uptake. This would explain the **gradual but progressive** nature of the decline seen between early 2024 and June 2026.

### 3d. Atmospheric Deposition on Needles

Pine needles have a large cumulative surface area and a waxy cuticle that is particularly effective at trapping and absorbing airborne hydrocarbons. Chronic low-level VOC deposition can block stomata, degrade the cuticle layer (increasing water loss), and reduce photosynthetic efficiency — weakening the tree over time.

## 4. Significance of the Neighboring Trees Observation

The document makes a critically important notation: *"None of the other trees West of this tree show this degree of distress."* This functions as a natural control group. If the decline were attributable to regional drought, disease, pest infestation, or soil-wide nutrient deficiency, neighboring trees of the same species would show similar symptoms. The fact that they do not strongly implicates a **localized, point-source stressor** — precisely what a FRAC tank in close proximity represents.

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## 5. Opinion

Based on the visual timeline evidence presented, the temporal correlation between the FRAC tank being placed into service (February 2024) and the observable decline of the adjacent pine tree (documented by June 2026) is **highly suggestive of a causal relationship**. The approximately 24–28 month lag between tank activation and visible canopy stress is consistent with how chronic, low-level chemical stress manifests in mature conifers — trees of this size do not decline overnight; stress accumulates gradually before becoming visually apparent.

The localized nature of the decline — affecting this tree and not its western neighbors — substantially undermines alternative explanations and points toward a **point-source environmental stressor**, of which the FRAC tank is the most obvious candidate introduced during the relevant period.

## 6. Recommendations for Strengthening the Case

If this analysis is being prepared for legal, regulatory, or environmental purposes, the following would significantly bolster the evidentiary record:

1. Ambient air quality sampling around the tank for VOCs and H<sub>2</sub>S
2. Soil sampling at the root zone for hydrocarbon contamination
3. Arborist inspection report documenting the tree's current health and identifying chemical stressors

4. Tank content disclosure — identifying exactly what is stored is essential to pinpointing specific off-gassing compounds
5. Additional satellite imagery at 3–6 month intervals to document the progression
6. Wind pattern analysis to confirm the tank's position relative to prevailing winds and the tree

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*This analysis is based solely on the visual and contextual evidence presented in the submitted document. It represents an informed interpretive opinion and is not a substitute for professional arborist, environmental engineering, or toxicological assessment.*