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CUSTOMERS FIRST

Update on Valley Generating Station Methane Leak
Energy, Climate Change and Environment Justice Committee
September 15, 2020

Council File Number 20-1099
Council File Number 20-1107
Council File Number 17-0360
Council File Number 20-0620



Valley Generating Station Overview

- 576 MW natural gas fueled power plant with one 533 MW combined cycle unit and 43 MW simple cycle unit. Provides electricity for up to 460,000 residents.
- Located in the same site as LADWP's Health & Safety Office and Joint Safety and Training Programs.
- Natural gas supply provided through Southern California Gas Company's distribution system.
- Operates with advanced pollution control equipment to reduce nitrogen oxides (NO_x) emissions
- Two reciprocating gas compressors (primary and redundant) used to increase pressure before gas is combusted in generating units.
- Incidental or fugitive emissions are inherent to the design of reciprocating gas compressors.

Timeline of Events

- Most recent overhaul of the gas compressors were performed in 2014 and 2017 to replace seals and reduce the potential for fugitive emissions.
- In 2016, JPL starts statewide study on methane gas emitters. JPL indicated that VGS was in their flight path to another type of facility and only detected an incidental plume in 2017.
- In August 2019, fugitive emissions were observed by VGS staff during a regular inspection, a Root Cause Analysis was performed and found the emissions were coming from one of the compressors, indicating premature wear of the seals.
- In September 2019 through the first half of 2020, plant engineers worked with the compressor vendor to explore options for improved packing seals to reduce fugitive emissions.

Timeline of Events

- During the same time frame while working with the vendor (September 2019 - June 2020), necessary transmission line upgrades required VGS to be operated continuously for system reliability, restricting maintenance on the compressors.
- In July 2020, a purchase order for the packing seals was issued, with replacement scheduled for November 2020.
- On August 21, 2020, LADWP was informed of a detected methane plume which appeared to have increased from 2017.
- On August 27, 2020, the Power System worked with the Gas Company to raise the incoming gas pressure, which allowed for the isolation of the compressors in order to begin repairs and continue to operate the power plant.
- On September 5, 2020, repairs on the compressors were completed, resulting in an emission reduction, based on current operating conditions (one compressor remaining in standby), from 150 kg/hr to 3-6 kg/hr, which is approximately 96-98%.

Safety Precautions/Plume Delineation

- In August 2019, when LADWP was first aware of the increase in methane emissions, LADWP followed protocols to protect its employees and the public
 - Verified with gas monitors used at the VGS within the facility
 - Verified with gas monitors to ensure emissions weren't detected at fence line
- LADWP also compared readings with the 2019 EPRI study, and it confirmed the VGS Root Cause Analysis findings
- EPRI readings confirmed that the fugitive emissions were coming from the two compressors.
- In addition, JPL had also conducted a flyover in 2017 and additional flyovers in 2020. Results showed the plume was limited to the compressor area.
- No worker safety issues were identified, and we did not notify beyond the VGS boundary.

Methane Gas Usage and Health Impacts

- Methane is not a California Toxic Air Contaminant or a US EPA Hazardous Air Pollutant.
- Based on Southern California Gas (So Cal Gas) Natural Gas Safety Data Sheet (SDS):
 - Natural gas' overall composition does not cause eye and skin irritation, and does not cause chronic effects or respiratory sensitization.
- Natural Gas is not Regulated as a Carcinogen by
 - OSHA
 - International Agency for Research on Cancer (IARC)
 - United States Department of Health and Human Services' National Toxicology Program

Component and Percent by Volume	
Methane: 80-99%	Ethane: 0.1-12%
Propane: 0-5%	Butane: 0-1.5%
Carbon Dioxide: 0-3%	Odorants at trace amounts

Methane Gas Usage and Health Impacts

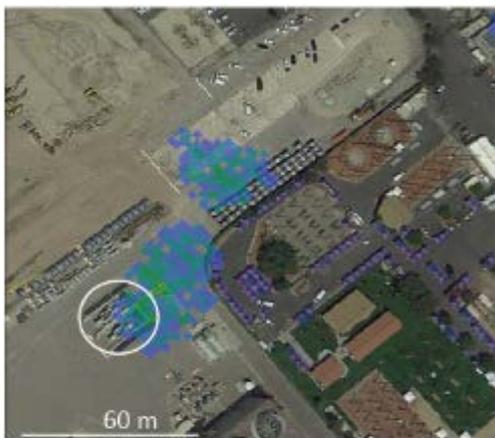
- Health Hazard:
 - Simple Asphyxiant: can pose a suffocation hazard in confined spaces
 - Otherwise Methane is Biologically Inert
- Physical Hazard:
 - At large concentrations, methane is highly volatile/flammable.
- All hazards listed on SDS do not apply to VGS.
 - The compressor area is not confined, but located outdoors away from any buildings, and therefore does not pose a suffocation hazard.
 - The compressor area has signage stating flammable/volatile and personnel have gas detection meters that would alarm if methane is detected at 10% of the level required to support flammability.
- Emission levels did not threaten the health and safety of plant personnel and the public.

JPL Emission Study

- Since 2016, JPL has conducted a statewide study on methane emissions.
- In 2017, JPL study showed plume over VGS was considered incidental.
- In 2020, JPL study showed an increase of the plume over VGS.



NASA Instrument Tracks Power Plant Methane Emissions - VGS



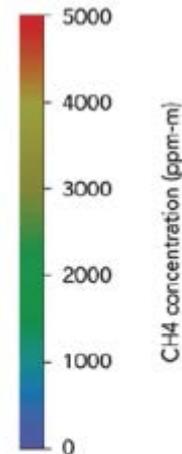
September 7, 2017
96 +/- 28 kgCH₄/yr



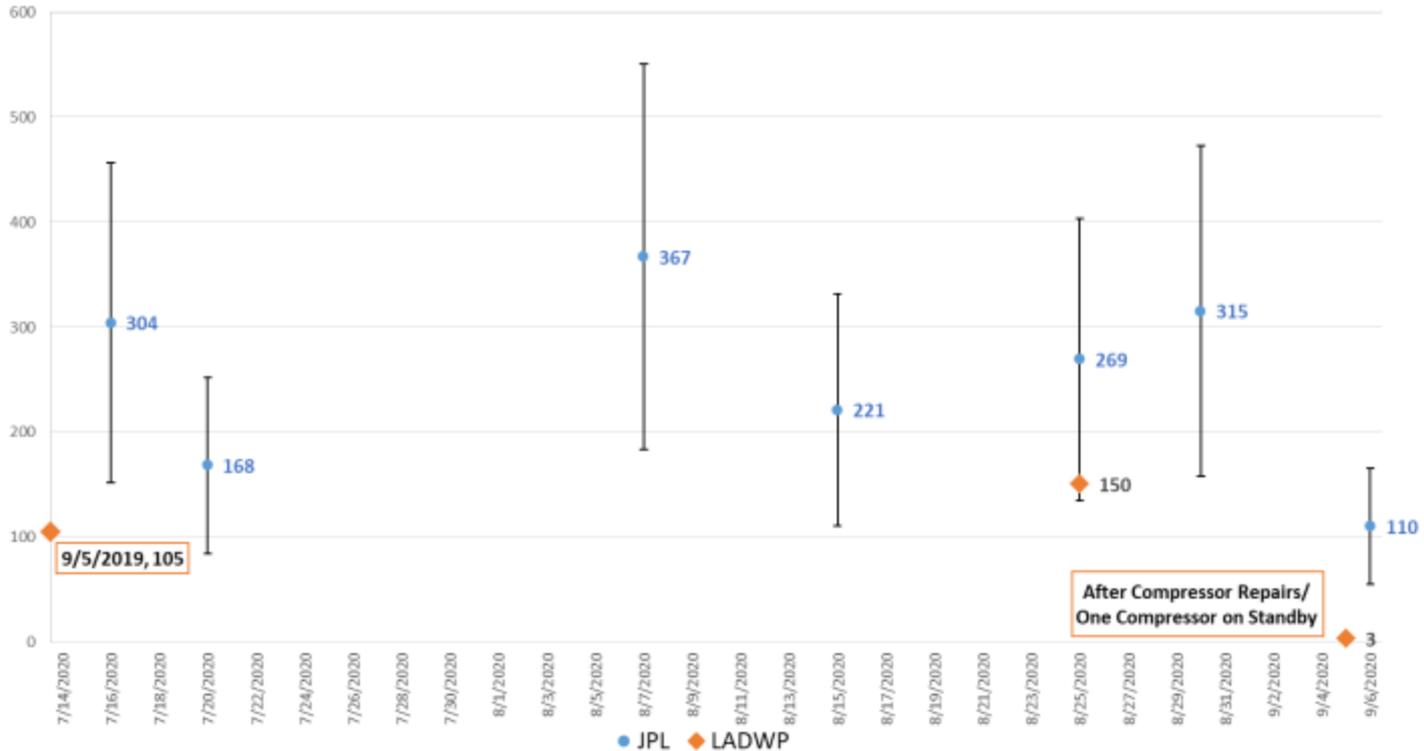
August 7, 2020
367 +/- 200 kgCH₄/yr



Sept 6, 2020
110 +/- 52 kgCH₄/yr

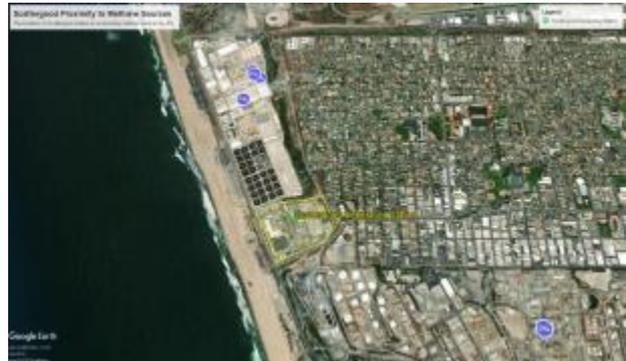


Methane Emission Rates (kg/hr) Recorded by JPL and LADWP



- Single data points need to be averaged over time to accurately determine emission rate.
- Results vary due to wind speed and other factors; each single data point is an instantaneous snapshot that is not intended to be used as the rate over time.
- LADWP results shown on 9/5/2019 and 8/25/2020 are within range of variability.

JPL Study and Flyovers – Coastal Plants



- Out of 199 observed methane emitters found within LA County, LADWP's three coastal plants were not found to be emitters.
- Figures above show no plumes found over Harbor, Haynes, or Scattergood.

Regulatory Requirements

- AQMD Title V Air Quality Permit
 - Advanced Pollution Control/Best Available Control Technology.
 - Continuous Emission Monitoring System.
 - No enforceable limits for fugitive emissions.
 - No permit required for the compressors.
- AQMD – Community Investigations
 - AQMD monitoring showed that methane levels around the perimeter of the facility and the community to be within typical background levels.
 - No elevated levels of toxic volatile organic compounds within facility.
- CARB Greenhouse Gas (GHG)
 - CO2 emissions from electricity generation reported to CARB.
 - No reporting requirements for fugitive methane emissions.
 - Power plants are subject to GHG requirements only for combustion of natural gas to produce electricity.

Moving Forward, LADWP will:

- Develop a policy that proactively identifies and repairs methane leaks in a timely manner.
- Develop air quality monitoring data base for the public view for real time updates.
- Work collaboratively with AQMD on fence line monitoring and establish a community notification protocol.
- Monitor and quantify fugitive emissions.

Community Emission Reduction Grant Program

- As we transition to a clean energy future, environmental justice is a priority.
- Valley Communities are disproportionately burdened by multiple pollution sources, such as refineries and truck traffic and are ranked high in CalEnviroScreen.
- LADWP funding grants for emission reduction projects over the next 5 years, which includes Council Districts 2, 6, and 7.
- Purpose is to reduce particulate, nitrogen oxide, and greenhouse gas emissions.
- Grant opportunities will be available in late Fall 2020.

QUESTIONS