Item 9.B.1

Los Angeles Department of Water & Power

INFORMATIONAL BOARD LETTER

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DATE: September 7, 2020

SUBJECT: Update on Valley Generating Station Methane Gas Leak

SUMMARY

On August 21, 2020, LADWP was informed that the Jet Propulsion Laboratory's (JPL) recent airborne emission surveys of the Los Angeles basin detected increased methane plumes over the Valley Generating Station (Valley). LADWP subsequently reported this notification to the Board of Water and Power Commissioners (Board) during the August 25, 2020 Board meeting. As requested by the Board, LADWP is providing additional information regarding methane emissions at Valley.

In August 2019, LADWP became aware of an increased methane leak in the gas compressor units at Valley. LADWP engineers subsequently determined that the existing packing seals were leaking. Between September 2019 and June 2020, LADWP engineers worked with the vendor in procuring improved packing seals known as low emission seals. A purchase order to replace the seals with this improved technology was issued in July 2020, with a repair date scheduled for November 2020 during a scheduled plant outage. The outage could not occur earlier due to the need to continue operating Valley in order to maintain electrical system reliability and minimize power outages during transmission line upgrades.

On August 31, 2020, emergency, temporary repairs were completed on the first of the two gas compressors. Repairs for the second compressor were completed on

September 5, 2020. Based on current operating conditions with one unit in service and the second unit offline, emissions have been reduced between 96 percent and 98 percent. These repairs could be completed because of the assistance provided by the Southern California Gas Company (SoCalGas). As requested by LADWP, SoCalGas was able to raise the incoming gas pressure, which allowed Valley to isolate the compressors and make temporary repairs while continuing to operate the power plant for reliability purposes. If SoCalGas cannot continue to maintain the higher operating pressure, the second unit will need to be returned to service, which will result in slightly higher emissions and an average of 88 percent emission reduction for both compressors.

Based on data recently provided by JPL from their statewide methane emission study and measurements conducted by the South Coast Air Quality Management District (SCAQMD), methane has been observed at higher levels within the power plant due to the gas compressor leak. However, it has not been detected above background levels outside the facility. As described in the attached statement, SCAQMD deployed its mobile monitoring platform on August 27, 2020 to monitor methane levels around the facility's perimeter and in the community. Results from those measurements showed methane levels to be within typical background levels. In addition, SCAQMD did not observe elevated levels of toxic volatile organic compounds within the facility or offsite.

During the initial assessment of the leak, LADWP determined that there was no risk to employees and as such, no public notices were issued. Moving forward, LADWP is committed to improving communication and the sharing of monitoring data with the local community. LADWP will develop a policy to proactively identify and repair methane leaks and provide timely, online notifications of air quality data for Valley, including both power plant emissions and fence line monitoring data.

SAFETY PRECAUTIONS

As part of worker safety protection, LADWP has established safety protocols to ensure employees are not exposed to elevated levels of natural gas through onsite controls and monitoring at LADWP facilities, including Valley, which is home to the Chief Safety Officer, the offices of Corporate Health and Safety, Power System Safety, Joint Safety and Training, and three Power System Training programs.

Specifically, onsite controls for the compressors at Valley include clear demarcation with signage openly communicating the presence of flammable gas as well as the prohibition of smoking or open flames within 50 feet of the surrounding area. Valley personnel have gas detection meters that alarm in the event that methane concentrations reach ten percent of the level required to support flammability. In the instance that a meter alarms, standard operating procedures require immediate investigation into the potential presence, location, degree of emissions and need for restoration. Notifications are made to plant management and safety personnel to ensure, if needed, timely mobilization of emergency response personnel and/or implementation of evacuation measures. It is important to note that detection meter readings consistently indicate that methane levels surrounding the compressor station where Valley personnel work are

below concentrations associated with flammability. The location of the compressors allows for proper ventilation and, thereby, limits the ability of emissions to accumulate at levels that threaten the health and safety of plant personnel and the public.
For background information, raw natural gas, in its original pretreated state, can include pollutants such as benzene and other contaminants. Valley receives treated consumer grade natural gas that has significantly reduced contaminants. At 80 percent to 99 percent by volume, the primary component of natural gas is methane. Methane is colorless, odorless, and non-toxic, according to SCAQMD's Fact Sheet on Aliso Canyon Gas Leak Health Impacts. In addition to trace amounts of odorants added to allow for rapid detection, natural gas may contain smaller, but varying, percentages of ethane, butane, propane, and carbon dioxide. None of the components are regulated as a carcinogen by the Occupational Safety and Health Administration (OSHA), Cal/OSHA, the International Agency for Research on Cancer and the United States Department of Health and Human Services' National Toxicology Program. Moreover, SoCalGas's Safety Data Sheet on natural gas specifies that natural gas' overall composition is not expected to cause eye and skin irritation and is free of association with chronic effects and respiratory sensitization.

Methane is a simple asphyxiant and biologically inert. Adverse health effects result when levels are high enough to displace oxygen in the air. Displacement of oxygen can pose a suffocation hazard. However, this is generally only a concern in confined spaces (such as the inside of a tank), rather than outdoor environments or typical indoor environments, where oxygen is readily available. Methane emissions have been confirmed to be limited to the compressor area of Valley, which is located outdoors remote from facilities or structures that, otherwise, have the potential to capture accumulating concentrations of gas. In addition, the potential for accumulating concentrations of gas is further limited by its buoyancy. Since methane is lighter than air, upon release into the atmosphere it disperses over time and place. Natural gas' consumer grade state does not share the discharge or settling potential of its pretreated components.

REGULATORY REQUIREMENTS

Methane is not considered an air toxic, as it is not on the California Toxic Air Contaminants list nor is it on the United States Environmental Protection Agency Hazardous Air Pollutants list. Methane is considered a greenhouse gas, which is regulated through state and federal regulations. LADWP's power plants are also subject to state and federal reporting requirements for greenhouse gas emissions, but only for the combustion of natural gas to produce electricity. These regulations do not require generating units to report vented natural gas or fugitive emissions from natural gas equipment. With respect to the development of future regulations, the State of California is currently conducting studies to estimate methane leakage rates from large end-users of natural gas. These studies will be used to determine the extent of leaks from individual sources and to better inform future policymaking to reduce methane emissions.

Under current SCAQMD rules, the release of methane gas from a power plant is not subject to permitting or reporting. Valley's Title V air quality facility permit does not have enforceable limits on fugitive emissions such as methane, nor does it have specific permitting conditions for facility's gas compressors. However, any discharges that cause injury or nuisance to the public, or which endanger the comfort, health, or safety of the public are subject to the nuisance rule (SCAQMD Rule 402), regardless of the type of source or quantities of air contaminants. As supported by measurements taken by JPL, SCAQMD, and Corporate Health and Safety, Valley's emissions have been limited to the compressor area and have not been known to migrate beyond the source or the facility boundaries to trigger a violation of this rule.

On August 27, 2020, SCAQMD staff issued Valley a Notice to Comply (NTC) per Health and Safety Code 42303. Under this code, SCAQMD can require facilities to provide information, plans, or specifications that disclose the nature, extent, and quantity of air contaminants which may be discharged by the source for which the permit was issued. Though the gas compressors are not required to be permitted by SCAQMD, Valley is subject to a facility wide permit. Under the NTC, Valley was requested to provide information on their gas usage and emission quantification, as well as, maintenance records, manufacturers' specifications, and manufacturers' recommendations. LADWP is cooperating fully with SCAQMD and is in the process of completing the response by the NTC deadline.

JPL METHANE EMISSION STUDY

Since 2016, JPL with the National Aeronautics and Space Administration (NASA) has been conducting a statewide study on air emissions, which branched out to focus on methane emissions. The methane study performed by JPL is intended to develop a baseline assessment on methane emissions in the State of California. As part of the study, JPL has conducted flyovers via an aircraft that measured methane emissions from different sources. The first phase of the study included data from 2016 through 2018. This data was subsequently compiled into a report that was published in July 2020 and is now publicly available. As a result of the study, JPL found at least 600 methane emitters, categorized them, and quantified the percentage of emissions. Power plants in general were shown to be typically low emitters and represent approximately two percent of total methane emissions, versus other categories such as dairy farms and landfills, which are 26 percent and 43 percent, respectively. Since the publication of the first report, JPL has received additional funding from NASA, allowing the flyovers to continue through 2020.

On August 21, 2020, LADWP was notified that JPL's recent airborne remote-sensing surveys of the Los Angeles basin detected increased methane plumes over the Valley power plant. The reason for the notification was due to the increase of the plume since the last overflight in 2017. JPL indicated that it is standard procedure to notify the owner of a facility when they detect a plume they consider to be noteworthy due to the volatility of methane gas. The plumes were observed during JPL's six overflights in July and August, 2020. Though JPL noted that the methane emissions recently detected over

Valley appear to have increased since the last recorded overflight in 2017, JPL advised that these single data points must be averaged over time to accurately determine the rate of emissions and that emission rates will vary based on operation of the equipment and environmental conditions such as wind speed. JPL also indicated that at the time of the 2017 overflights, the methane emission rate observed at Valley was one of the smaller emitters among the 600 observed methane emitters statewide. However, in the most recent flyovers, preliminary, short term data placed Valley as one of the higher observed methane emitters. Additional overflights by JPL are expected to show significantly lower emissions since the emergency repairs for the compressors are currently underway at the facility. An estimation of the recent leakage rate from onsite measurements of Valley's compressors was approximately 150 kilograms per hour (kg/hour). By contrast, methane emissions from dairies within California can be over 1,000 kg/hour.

GAS COMPRESSOR REPAIR EFFORTS

Valley currently uses two reciprocating gas compressors to supply natural gas to the generating units. The design for these type of compressors can result in fugitive emissions due to leakage from the seals associated with the constant movement of the piston rods that move in and out of the cylinders.

As part of scheduled maintenance and in order to minimize leaks, the two compressors were overhauled in 2014 and 2017, respectively. However, in August 2019, it was noticed that leakage in the second redundant compressor may have increased. Valley station personnel performed a root cause analysis to identify the source of the leak from the compressor and determine the necessary repairs. They determined that the leaks were coming from the packing seals, indicating premature wear of the seals, and began working with a compressor vendor to explore low-emission packing upgrades to address fugitive emissions. LADWP also compared readings with the 2019 Electric Power Research Institute study, which confirmed the root cause analysis findings. Replacement of the seals and scheduled maintenance, which is planned for November 2020, could not occur earlier due to the need to continue operating Valley during concurrent multi-year transmission line upgrades into and out of Valley in 2019 and 2020.

Emergency Repairs Prior to Scheduled Maintenance

On August 26, 2020, LADWP contacted SoCalGas to request an increase of the gas trunk line pressure delivered to Valley, which would allow the facility to bypass and turn off its gas compressors to allow for repairs on the seals. On August 27, 2020, SoCalGas raised the supply pressure and Valley was able to isolate Compressor A, which has been leaking the most and have Compressor B on standby. This allowed Valley facility personnel to inspect and disassemble Compressor A and replace the packing seals. After the repairs were completed on August 31, 2020, the leakage rate from Compressor A was significantly reduced from an estimated 90 kg/hour to three to six kg/hour, depending on the compressor's mode of operation. Compressor B repairs were

completed on September 5, 2020, with a reduction in the emission rate from 60 kg/hour to 12 kg/hour, when the unit is in standby mode. However, since SoCalGas is currently able to maintain a higher gas pressure, Compressor B remains offline with no emissions.

Future Compressor Replacement

Following the scheduled replacement of the packing seals in November 2020, Valley will continue monitoring fugitive emissions from the compressors. In addition, facility personnel will evaluate the effectiveness of the new low-emission packing seals. If the leaks persist, LADWP will then conduct an engineering feasibility study for the replacement of the reciprocating gas compressors with rotary screw compressors that are not susceptible to leakages. Valley is currently requesting specifications and quotations from manufacturers.

EMISSION MONITORING AND COMMUNITY REPORTING POLICY

In order to improve communication and the sharing of monitoring data with the local community, LADWP will develop a policy that proactively identifies and repairs methane leaks and provides timely, online notifications of air quality data for Valley. The reported information will include both power plant emissions and facility perimeter monitoring data. LADWP will be requesting assistance from SCAQMD to establish a fence line monitoring program to evaluate on an ongoing basis of the methane and volatile organic compounds levels in and around the perimeter of the Valley facility and in the community.

LADWP also continues to move forward with implementing the Community Emission Reductions Grant Program approved by the Board in December 2019. The grant program will provide funding up to a total of $10 million over five years for selected regulatory agencies and non-profits, to be used in Council Districts 2, 6, 7, and 15 for emission reduction projects. This program will directly benefit the community surrounding the Valley power plant and advance the goals of the City of Los Angeles "Transformative Climate Communities" program to reduce exposure in communities most impacted by air pollution.

ATTACHMENT

- SCAQMD Valley Generating Station Community Investigation Update

Valley Generating Station

Valley Generating Station

Background

On August 26, 2020, South Coast AQMD learned of an ongoing methane leak occurring at the Los Angeles Department of Water and Power (LADWP) Valley Generating Station located in Sun Valley. South Coast AQMD had not received any prior public complaints concerning odors from the facility, nor were any leaks reported.

Ongoing Investigation

An inspector was dispatched to the site that evening and used a FLIR optical gas imaging camera and handheld toxic vapor analyzer (TVA) to identify leaks consistent with what was reported by LADWP.

A team of inspectors were sent to the site again on August 27th and September 2nd and identified additional leaks at the facility. A Notice to Comply was issued to LADWP requesting maintenance records, data, and other information.

This facility operates under South Coast AQMD's Title V and RECLAIM programs and is subject to annual onsite inspections. Although South Coast AQMD does not regulate methane emissions, it is currently evaluating next steps including potential enforcement actions.

Methane is regulated by the California Air Resources Board (CARB) and South Coast AQMD is coordinating with CARB on future actions and will update this page with further information as it becomes available.

Mobile Platform Air Measurement Results

In addition to an inspection team, South Coast AQMD deployed its mobile monitoring platform to evaluate methane levels in and around the perimeter of the facility and in the community. Results from those measurements showed methane levels to be within typical background levels.

In addition, four air samples were collected on site and upwind. These were analyzed for methane and volatile organic compounds (VOCs). Results of samples taken onsite show elevated levels of methane. No elevated levels of toxic VOCs were observed. The upwind sample results show methane and other VOCs within typical levels.

View Lab Reports (/docs/default-source/default-document-library/vgs-lab-reports-9-2-20.pdf?sfvrsn=6) (PDF)

Map showing measurements near the LADWP Valley Generating Station. Elevated levels are results from samples taken on site. (August 27, 8:30am-12pm)

Complaints

South Coast AQMD continues to encourage the public to call our complaint line at 1-800-CUT-SMOG (tel:1-800-CUT-SMOG) (800-288-7664) or use the on-line (http://www3.aqmd.gov/webappl/complaintsystemonline/NewComplaint.aspx) complaint system to report odors, dust, or any other outdoor air quality concern. The agency continues to attempt to respond to each complaint received. More guidance and helpful tips when calling the complaint line can be found at: www.aqmd.gov/home/air-quality/complaints (http://www.aqmd.gov/home/air-quality/complaints).

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