South Coast
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Assessment of Hexavalent Chromium Data at Paramount Schools

May 3, 2017

Objective and Background

As part of the ongoing investigation to identify and address sources of hexavalent chromium (Cr6) in the City of Paramount, the SCAQMD, with assistance from the California Air Resources Board (CARB), is conducting air sampling for Cr6 at schools in Paramount. The objective of this sampling effort is to assess whether elevated levels of Cr6 (found in some industrial areas) may also be found at the local schools.

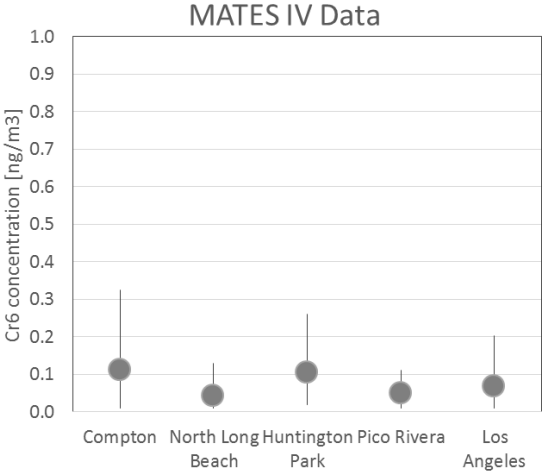
This report is an updated assessment of the monitoring data from the school sites. The previous reports (from February 22, 2017 and April 12, 2017) can be found on the aqmd.gov website.

Approach/Methodology

To determine the levels of Cr6 at the local schools, a sampling program was established to monitor Cr6 concentrations. Sampling began on 12/23/2016 at six Paramount area schools. Sampling for Cr6 at the school sites is conducted over a 24-hour period every third day (one 24-hour sample every third day, or 1-in-3 day sampling schedule). At each Paramount school site, a minimum of seven valid results are used in the assessment. With this sampling schedule, seven data points represent a minimum of two and a half weeks of monitoring, and is a reasonably balanced assessment of the levels at that location during this time period. Sometimes, a sample is determined to be "invalid" due to loss of power in the sampler, equipment malfunction, or other technical reasons. To ensure high quality data, invalid samples are not part of this assessment. To date, this sampling effort resulted in the collection of at least seven valid samples from each of the 12 Paramount area schools surveyed by SCAQMD and CARB.

The overall sampling results from each school will be compared to "background" or typical Cr6 levels found elsewhere in the South Coast Air Basin ("Basin"). Specifically, the Cr6 levels detected at each school are compared to the Cr6 levels from SCAQMD's Multiple Air Toxics Exposure Study IV (MATES IV) <http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv>. The MATES IV study provides a regional estimate of the range of "background" or typical levels of air toxic pollution in 2012-2013 from ten locations

throughout the region. The purpose of these comparisons is to indicate whether the levels measured at the Paramount schools are relatively consistent with air toxics monitoring data across the region. If the levels at a school are relatively consistent with levels at MATES IV monitoring sites near Paramount, then no further investigation at that location is needed. Because it is long-term exposure to Cr6 that is associated with increased cancer risk, the key comparison is for the average levels of Cr6, although the range of measured levels is also part of the assessment.



For MATES IV data, the graph displays the average and the range from the 5th to the 95th percentile of daily average data from the entire study period (7/2012-6/2013).

SCAQMD staff will continue to assess all sampling results with follow-up investigations of potential nearby sources if high levels are detected. Additionally, if the SCAQMD investigation in the Paramount area identifies a facility of concern, the SCAQMD will assess the need for monitors at schools near the facility of concern. This could include schools that previously had monitors, as well as schools where sampling has not yet occurred.

The investigation into potential sources of Cr6, as well as the activities implemented to reduce Cr6 emissions from identified sources continues in parallel to the school-based monitoring. Therefore, levels of Cr6 at the schools may be further reduced as the investigation and compliance activities proceed.

The following five monitoring sites from the MATES IV study were located generally in the central LA and south LA areas, and provide a good basis for comparison: Compton, North Long Beach, Huntington Park, Downtown Los Angeles and Pico Rivera.

Assessment

This report includes an updated assessment for the three schools where additional sampling results since the previous report (from April 12, 2017) are now available: Abraham Lincoln Elementary School ("Lincoln"), Wesley Gaines Elementary School ("Gaines") and Major Lynn Mokler Elementary School ("Mokler"). Four additional schools that were not previously assessed are also included in this report: Los Cerritos Elementary School ("Los Cerritos"), Howard Tanner Elementary School ("Tanner"), Paramount High School--West Campus ("Paramount HS West"), and Theodore Roosevelt Elementary School ("Roosevelt").

The previous report (from April 12, 2017) already included a complete assessment at Harry Wirtz Elementary School, Mark Keppel Elementary School, Frank J. Zamboni Middle School, and

Alondra Middle School. Since no additional samples were collected from these sites since April 12, they are not discussed in this document.

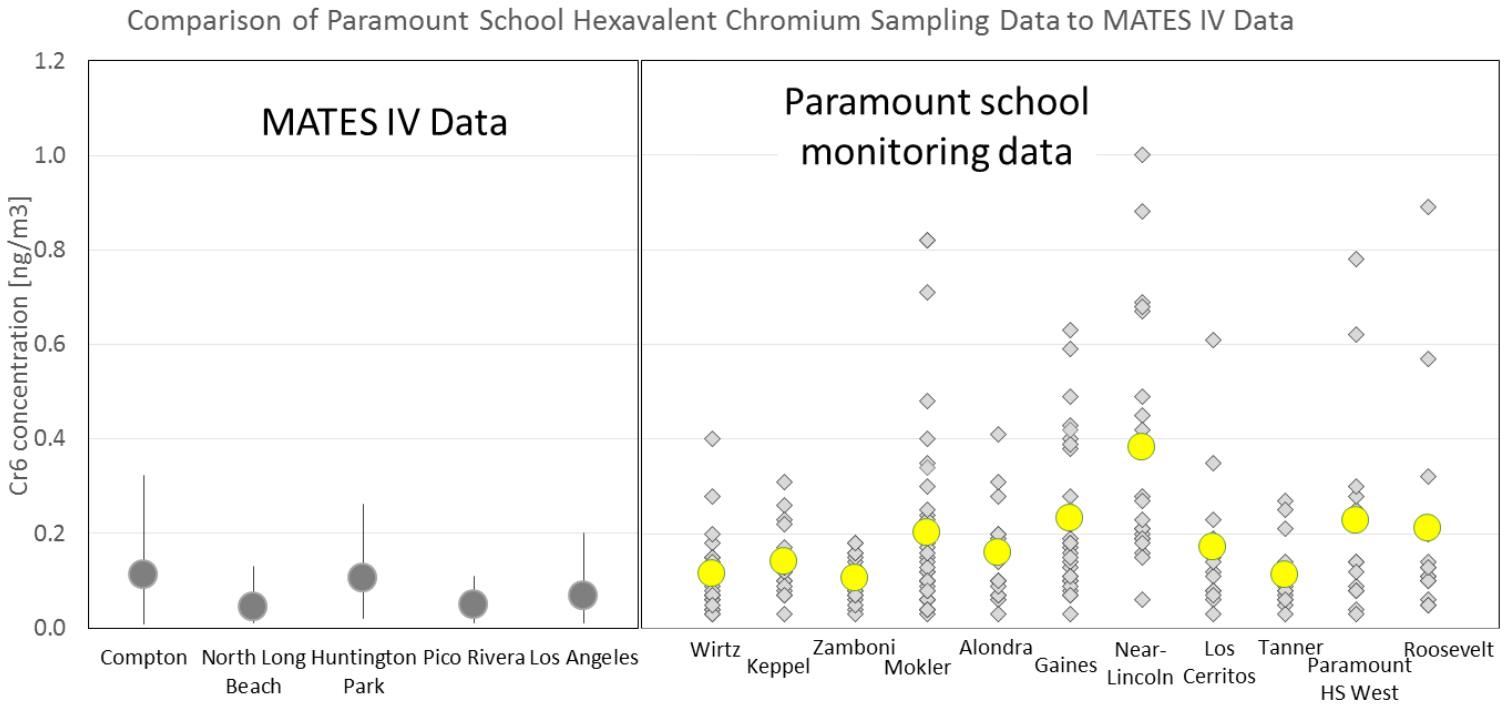
The following is the latest assessment of the Paramount school sites with seven or more valid results:

- Wesley Gaines Elementary School: Based on valid results from the Wesley Gaines Elementary School site collected between 1/25/17 through 4/28/17 (29 valid results), the average Cr6 level measured at this site was 0.23 ng/m3, with a range of 0.03 to 0.63 ng/m3. While the average level and the majority of the samples at this location are similar to Cr6 levels found elsewhere in the Basin in the MATES IV study, a few of the results from this site are higher than the 5^{th} to 95^{th} percentile data range from MATES IV. However, there were a handful of samples from MATES IV that had concentrations higher than these results. Importantly, it is the average level that provides the best estimate of long-term exposure, which is what affects long-term health risks. Staff is continuing to investigate potential sources of Cr6 in the areas near this school.
- Abraham Lincoln Elementary School: Based on valid results from a monitoring location near Abraham Lincoln Elementary School collected between 2/18/17 through 4/28/17 (23 valid results), the average Cr6 level measured at this site was 0.38 ng/m3, with a range of 0.06 to 1.00 ng/m3. The average level at this site is higher than typical Cr6 levels in the Basin measured during the MATES IV study. Staff is continuing to investigate potential sources of Cr6 in the areas near this school.
- Los Cerritos Elementary School: Based on valid results from the Los Cerritos Elementary School site collected between 3/20/17 through 4/28/17 (13 valid results), the average Cr6 level measured at this site was 0.17 ng/m3. The results ranged between 0.03 to 0.23 ng/m3, with the exception of two samples collected on 4/7/17 and 4/22/17, which had a levels of 0.61 ng/m3 and 0.35 ng/m3. While the average level and all but two of the samples at this location are similar to Cr6 levels found elsewhere in the Basin in the MATES IV study, the one result from 4/7/17 is higher than the range of the 5^{th} to 95^{th} percentile data from MATES IV, and the result from 4/22/17 is slightly higher than this range. However, there were a handful of samples from MATES IV that had concentrations higher than these results. As noted earlier, it is the average level that provides the best estimate of long-term exposure, which is what affects long-term health risks.
- Major Lynn Mokler Elementary School: For this site, two monitors were placed side by side ("co-located") at this school to help evaluate data quality. For the purpose of this data assessment, only data from the primary monitor (labeled "Mokler 1") is used. The primary monitor had more complete data, and the results across the two monitors at this location were generally similar. Based on valid results from this site collected between 12/23/16 through 4/28/17 (38 valid results), the average Cr6 level measured at

this site was 0.21 ng/m3, with a range of 0.03 to 0.82 ng/m3. While the average level and the majority of the samples at this location are similar to Cr6 levels found elsewhere in the Basin during MATES IV, a few of the results from this school are higher than the 5th to 95th percentile data range from MATES IV. However, there were a handful of samples from MATES IV that had concentrations higher than these results. Importantly, it is the average level that provides the best estimate of long-term exposure, which is what affects long-term health risks. Staff is continuing to investigate potential sources of Cr6 in the areas near this school.

- Paramount High School—West Campus: Based on valid results from the Paramount High School—West Campus site collected between 3/20/17 through 4/28/17 (14 valid results), the average Cr6 level measured at this site was 0.23 ng/m3. The results ranged between 0.03 to 0.30 ng/m3, with the exception of two samples collected on 3/23/17 and 4/4/17, which had levels of 0.78 ng/m3 and 0.62 ng/m3, respectively. While the average level and all but two of the samples at this location are similar to Cr6 levels found elsewhere in the Basin during MATES IV, the two results from 3/23/17 and 4/4/17 are higher than the 5th to 95th percentile data range from MATES IV. However, there were a handful of samples from MATES IV that had concentrations higher than this one result. As noted earlier, it is the average level that provides the best estimate of long-term exposure, which is what affects long-term health risks.
- Theodore Roosevelt Elementary School: Based on valid results from the Theodore Roosevelt Elementary School site collected between 3/20/17 through 4/28/17 (14 valid results), the average Cr6 level measured at this site was 0.21 ng/m3. The results ranged between 0.05 to 0.32 ng/m3, with the exception of two samples collected on 3/26/17 and 4/19/17, which had levels of 0.89 ng/m3 and 0.57 ng/m3. While the average level and all but two of the samples at this location are similar to Cr6 levels found elsewhere in the Basin in the MATES IV study, these two results are higher than the 5th to 95th percentile data range from the MATES IV study. However, there were a handful of samples from MATES IV that had concentrations higher than this one result. It is the average level that provides the best estimate of long-term exposure, which is what affects long-term health risks.
- Howard Tanner Elementary School: Based on valid results from the Howard Tanner Elementary School site collected between 3/20/17 through 4/28/17 (14 valid results), the average Cr6 level measured at this site was 0.11 ng/m3, with a range of 0.03 to 0.27 ng/m3, which is similar to Cr6 levels found elsewhere in the Basin in the MATES IV study.

The range and average of the sampling results for these sites are shown in the graph below.



For MATES IV data, the graph displays the average (gray circles) and the range (lines) from the 5th to the 95th percentile of daily average data from the entire study period (7/2012-6/2013). For the Paramount school sites, the graph displays the average (yellow circles) and each of the valid results (gray diamonds). Only those schools that have at least 7 valid results are included in this graph. This graph reflects the monitoring data collected at Paramount schools from Dec. 23, 2016 through Mar. 17, 2017 for Wirtz, Keppel, Zamboni, and Alondra, from Dec. 23, 2016 through Apr. 28, 2017 for Mokler, from Jan. 22, 2017 through Apr. 28, 2017 for Gaines, from Feb. 18, 2017 through Apr. 28, 2017 for the site near Lincoln school, and from Mar. 20, 2017 through Apr. 28, 2017 for Los Cerritos, Tanner, Paramount High School West and Roosevelt.

Because Cr6 is one of several air toxic pollutants, it is important to put these results into the larger context of the cancer risks associated with all air toxics in the region. Based on the MATES IV study, the average cancer risk in the Basin from all ambient air toxics combined (including Cr6) is approximately 900 chances in a million. While Cr6 may be a significant contributor to air toxics cancer risk in areas very close to Cr6 emitting sources, there are other important contributors to the overall risk. For example, diesel particulate matter contributes to about two-thirds of the overall air toxics cancer risk in the Basin.

Next Steps

SCAQMD staff is continuing to investigate and address sources of Cr6 in Paramount. This report will be updated as additional data are available for assessment.