August 4, 2016
AWS 1733

Cathy Reineke
San Mateo County Schools Insurance Group
1791 Broadway St
Redwood City, CA 94063

RE: Scope of Work – Drinking Water Sampling for Lead
San Mateo County Schools

Dear Ms. Reineke:

Air & Water SCIENCES (AWS) is pleased to provide this scope of work to collect drinking water samples at the schools within San Mateo County. The scope of work detailed herein is based on the information provided in discussions that took place on August 2, 2016. AWS has not visited the facilities and is basing this scope of work on similar work we have done in the past for other San Francisco Bay Area school districts.

The goal of the initial sampling effort at each school as proposed herein is to identify whether there are concerns regarding elevated lead levels from drinking water sources within the San Mateo County schools. The sampling strategy and protocols proposed are detailed below and are based on guidance provided by the US Environmental Protection Agency (EPA) in the document entitled "*3Ts for Reducing Lead in Drinking Water in Schools, Revised Technical Guidance, October 2006"(3T's)*.

Sampling Strategy

First it is assumed that the county schools have undergone routine maintenance to their water fountains' aerators and bubblers. Each fixture should be cleaned at least once per year by simply removing and rinsing the aerator or bubbler of any debris and replacing it back onto the fixture. With proper maintenance, aerators should not need to be replaced often; however, if the aerator is rusted out or corroded it should be replaced.

The number of samples collected per school depends on the level of testing San Mateo Office of Education (SMCOE) or the individual school decides to undertake; if needed AWS can assist SMCOE in making this decision. The EPA in their 3T's guidance document recommends sampling all high priority drinking water outlets at each school. High priority water sources are those used for drinking or

cooking and are described in more detail below under Sample Locations. This averages around 40 outlets for an average size public school (elementary, middle, and high schools). Please note that the EPA's 3T's document is solely a guidance document and is not a regulation. As the water agency is required to deliver safe water to the school at the street, the effort for the school should be to ensure that the piping and fountains are not contributing elevated lead to the water provided to the teachers and children. AWS has used representative sampling to evaluate piping and fixtures at a number of schools to determine conditions within the buildings. This is typically performed by grouping like outlets in the same building. For example, if six similar type fountains are within one building, quad or hallway, two representative samples can be collected from this type of fixture in a similar area. Using this method, most schools have between 15-40 primary outlets depending upon the size of the school. More or fewer outlets per school can be tested, of course, but the possibility of missing problem areas is much greater with fewer samples collected. We will work with the San Mateo County Office of Education to provide meaningful sampling strategies.

Initial sampling efforts at the schools focuses on "first draw" samples from high priority outlets. These are samples that are collected from the first flow of water after the line has been stagnant for a minimum of eight (8) hours and a maximum of eighteen (18) hours. The purpose of these samples is to identify whether elevated levels of lead are due to either the fixture or an upstream source.

In the event that elevated levels of lead are identified in any of the sources sampled, a follow-up sampling plan will be recommended to identify the source of lead in the water at the specific outlets with elevated levels. The follow-up samples will include flush samples, meaning they are collected after the water has been allowed to run for a specified time (usually 30 seconds) from faucets that failed to meet the target criteria. In addition, if outlets from a school do not meet target criteria, it was also likely be recommended to collect first draw samples from all previously untested high priority faucets, and 30 second and 3 minute flush samples from the tap that is closest to the water service connection to determine lead levels entering the school facility. Data from the follow-up samples will be compared to the initial samples and used to evaluate whether elevated lead levels are attributable to the outlet, upstream piping or other plumbing elements. The purpose of this additional sampling is to evaluate how problems encountered with the water quality during the initial sampling effort can be resolved, as well as to determine the exact number of units where concerns are presented.

Sample Locations

Water samples collected from high priority outlets include those that are used regularly for drinking and cooking. These include: drinking fountains (all types), kitchen sinks, classroom combination sinks with drinking fountains, and sinks in teachers' lounges, nurse's offices, special education and/or home

economics classrooms. AWS typically does not sample medium and low priority outlets such as classroom utility sinks (often found in science and art classrooms), bathroom faucets, other utility sinks and ice machines during the initial sampling.

As mentioned above AWS recommends collecting representative samples by grouping identical outlets in proximate locations and collecting a representative number of samples from each group. This strategy can be applied for two cases: 1) in classroom wings or quads of elementary schools where all classroom sink combination drinking fountains are identical, and 2) drinking water fountain pairs located immediately adjacent to each other.

Prior to sampling, a site survey at each school is needed to determine all high priority outlets, and secondly, which outlets should be selected for sampling. AWS will work with SMCOE staff knowledgeable about each location using site specific maps of the schools that are labeled with each sink, faucet and water fountain. AWS can also provide training and guidance in what types of information is needed in accomplishing this task. AWS will also field verify all maps and data when we are at each school.

The EPA 3T's guidance document recommends that samples be collected the day after a school day so that samples are collected under typical use patterns. When the sampling is done after a school day it is usually performed between 6:00am-8:00am the following morning (Tuesdays through Saturdays). The day before sampling SMCOE representatives will need to tape-off and label all outlets as "do not use" until sampling is completed in accordance with instructions and maps as discussed with AWS.

All sample locations will be recorded on facility maps as well as sampling documentation forms in a manner that they can easily be identified. In addition, AWS will record the manufacturers and models of all water coolers identified at each school and compare them against the list of water coolers banned by EPA in 1990 due to lead lining of the tanks.

Sampling and Analytical Procedures

A "first draw" water sample will be collected from each outlet selected for sampling. A "first draw" sample is of water that is the first to come out of the tap after a period of inactivity. This water should be stagnant meaning that the outlet should not be used for at least 8 hours prior to sampling. EPA recommends that the water should not sit for more than 18 hours as it will not then be representative of water provided during normal use. Those outlets that are infrequently used can be stagnant longer. A duplicate sample will be collected from one of the sample locations as a Quality Assurance/Quality Control (QA/QC) sample.

During follow-up sampling when outlets are found to have exceeded the target criteria of 15 ppb, the resampled faucets will include three types of samples:

1. A first draw sample from all remaining high priority faucets,
2. A 30 second flush sample from faucets that did not meet the target criteria during the first sampling event and,
3. A 30 second and a 3 minute flush sample from the outlet closest to the water service connection to the facility to test the water coming from the service connection pipes and also the main water line from the water supplier.

Samples will be collected in a 250 milliliters (ml) laboratory provided container. The sample size is representative of a smaller section of plumbing primarily associated with the fixture providing the water, and therefore, is more effective in identifying the source if elevated lead levels are identified and follow-up flush sampling is necessary.

Samples will each be given a unique sampling identification number. The sample location, date and time of collection, and the type and manufacturer of outlet will be recorded. Samples will be delivered by courier to Alpha Analytical Laboratories in Ukiah and Dublin, CA, under standard chain-of-custody procedures. This laboratory is certified by the State of California as part of the Environmental Laboratory Accreditation Program (ELAP# 1551). Water samples will be analyzed for lead by EPA Method 200.8.

Data Review

The analytical data will be reviewed and compared against applicable regulatory standards and guidance. The EPA Maximum Contaminant Level (MCL) for lead in public water systems is 15 parts per billion (ppb). For schools there is no regulatory standard; however, the EPA recommends that all high priority water outlets (i.e. those that provide water for drinking or cooking) meet a lead concentration of 20 ppb or less. AWS will compare all data collected from the initial sampling to the more stringent MCL of 15 ppb.

If lead levels in select outlets exceed the 15 ppb level, AWS will recommend the follow-up sampling listed above. This data is needed to help identify whether the source of lead is the fountain or tap or the building plumbing system. AWS will also provide a list and specific location information of any water coolers that may be in use that do not meet EPA regulations.

Reporting/Recordkeeping

AWS will provide a brief letter report for each school facility tested. The report will include sample location maps, a summary of the results, and recommendations for additional testing if needed. Supporting documentation including sampling and analytical procedures, sample location maps, and all analytical data from the laboratory will also be attached. In addition, AWS will enter all sampling data into an Excel format such that it can easily be accessed by the school district, and additional data, if collected in the future, can be added.

AWS appreciates the opportunity to provide this scope of work for you and we look forward to working with the San Mateo County Office of Education on this project. Please contact us at (707) 769-2289 if you have questions or comments regarding this scope or if you have additional site specific information that can be used to refine a cost estimate.

Respectfully submitted,
Air &Water SCIENCES

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