
BioMax Environmental

Consulting and Industrial Hygiene Services

October 26th, 2010

Ms. Mary Phelps
City of Richmond Engineering Services Department
450 Civic Center Plaza
Richmond, CA, 94804

Letter Summary Report
Preliminary Industrial Hygiene Monitoring and Assessment Services
Hydrogen Sulfide (H₂S)
Point Richmond Community and Wastewater Treatment Facility

Dear Ms. Phelps:

As per your request, BioMax Environmental, LLC (BioMax) is pleased to present this preliminary letter summary report providing BioMax's findings, conclusions, and recommendations pertaining to our recent performance of hydrogen sulfide gas (H₂S) monitoring within the City of Richmond Wastewater Treatment facility as well as identified areas within the Point Richmond community as directed by City of Richmond staff. BioMax understands that such monitoring has been requested by the City of Richmond Engineering Services Department – Source Control Division (City of Richmond) in an effort to provide professional monitoring and evaluation of current airborne hydrogen sulfide levels within the Point Richmond community following recent reports of odorous conditions experienced and reported by a number of community citizens.

Hence, monitoring locations identified by BioMax during this assessment included areas within the Wastewater Treatment Facility itself, areas of "concern" present within the community as identified by City of Richmond staff, as well as other locations within the community as determined by BioMax based on our best professional judgment.

All monitoring activities were performed by Mr. Michael A. Polkabila, CIH, REA, of BioMax Environmental, LLC. Mr. Polkabila is a Vice President and Principal with BioMax Environmental and was responsible for (and personally performed) all area site monitoring activities as part of this assessment. Mr. Polkabila has been certified in the Comprehensive Practice of Industrial Hygiene by the American Board of Industrial Hygiene and holds the right to the designation "Certified Industrial Hygienist" (CIH) under certification number CP7104. Mr. Polkabila is also certified by the California Environmental Protection Agency (Cal/EPA) as a Class 1 Registered Environmental Assessor (REA) under certification number 05011.

During these preliminary monitoring assessment activities, airborne detection and H₂S measurements were performed utilizing a portable (hand-held) Jerome Model 631-X Gold Film

Analyzer as procured by BioMax from EquipCo Instruments of Concord, California. This instrument is widely understood to be the "industry standard" in hand held H₂S monitoring devices and measures airborne H₂S concentrations accurately to a level as low as 1 parts per billion (ppb) according to information provided by the instrument supplier. Hence, this unit has been utilized throughout this monitoring assessment by and under the direct supervision of Mr. Michael A. Polkabila, CIH, REA as per the City's request. All preliminary and supplemental field monitoring procedures performed during these services were, therefore, conducted in accordance with applicable California Department of Occupational Safety and Health (Cal/OSHA) standards and professional certified industrial hygiene work practices.

Hydrogen Sulfide (H₂S) Monitoring Findings:

Based on current and historical information provided to BioMax, airborne H₂S monitoring was performed on October 20th, 21st, 23rd, and 24th within the City of Richmond and community locations noted below:

- Accessible locations within and/or surrounding City of Richmond Waste Water Treatment Facility located at 601 Canal, Blvd., Richmond, California.
- Various sewer and storm water manhole access locations identified by City of Richmond staff.
- Areas within the City of Point Richmond identified as locations where community "reports" of odors have been noted including:
 - 479 W. Richmond Avenue
 - 331 E. Richmond avenue
 - 55 Idaho Street
 - 318 Washington Avenue
 - 225 Contra Costa Street
 - 28 Montana Street
 - 226 E. Scenic Avenue
 - 651 Ocean Avenue (as added on 10/24/10)
- Other representative areas located throughout the community as identified by BioMax.

It should be noted that light to moderate precipitation was noted during the majority of sampling activities performed on 10/23 and 10/24, respectively.

Waste Water Treatment Facility - Preliminary findings indicated insignificant levels of H₂S at the majority of the accessible locations sampled within the City of Richmond Waste Water Treatment Facility. However, the area of initial sewer filtration and effluent entrance into the facility designated as the "Wet Well" area indicated detectable levels which ranged from 1 ppb to 53 ppb. Such measurements were collected at the well head area during the noted period of sampling.

Sewer and Storm Water Manhole Access Areas - Instrument monitoring findings associated with sewer manhole and storm water manhole areas (located on public streets) indicated varying levels of H₂S ranging from 1 ppb to as high as 650 ppb as measured at a single removed manhole

cover during our survey. These noted areas with significantly elevated H₂S detected existed at a single sewer main manhole located at the corner of W. Richmond Ave and Railroad Ave nearest the Mechanics Bank building. During our inspection, it was noted that "sewer-like" odors were present as detected by olfactory sense (smell). Sampling was performed at multiple intervals at this location and indicated varying detectable levels as high as 650 ppb during a single monitoring period at the open manhole. Following the identification of this elevated H₂S level, a plastic cover was installed beneath the noted manhole cover and retesting indicated negligible emissions as a result of this temporary corrective measure. Also noted during our assessment were observations of a number of manhole covers at community sewer line locations which had the existence of "holes" cast-in the manhole cover itself. According to City of Richmond staff, sewer covers are typically installed with solid covers and storm water manhole covers are typically installed with holes. Hence, this finding of a number of localized sewer manhole covers with the existence of cast-in holes should be investigated further as it is likely a deviation from common City practice. BioMax believes that such conditions represent a potentially significant contributing factor to the occurrence of "sewer-like" odors within the community and, therefore warrants appropriate corrective mitigative action.

Areas of Concern Identified Within the Point Richmond Community - All areas monitored and recorded within the Point Richmond community indicated measured H₂S levels which were at or below the lower detectable instrument levels (less than 1 ppb) of H₂S.

All monitoring and data gathering actions were performed in accordance with standard industrial hygiene procedures as well as standard data recording practices and documentation. Original Instrument Monitoring Records may also be provided for review upon request.

Conclusions and Recommendations:

According to current applicable regulatory standards established by the Bay Area Air Quality Management District (BAAQMD) for ambient levels of Hydrogen Sulfide, a level of 30 parts per billion (ppb) has been adopted as the maximum allowable concentration averaged over a 1 hour period. The BAAQMD has also adopted a limit of 60 ppb for an exposure period averaged over a 3 minute period. Other applicable regulatory limits for H₂S have also been adopted by California's Division of Occupational Safety and Health (Cal/OSHA), included in Title 8 CCR 5155, wherein allowable limits have been established for workers at 10,000 ppb averaged over an eight hour working period, 15,000 ppb averaged over a 15 minute period, and 50,000 ppb as a ceiling limit, respectively. The American Industrial Hygiene's Emergency Response Planning Guideline (ERPG) has stated that a maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects of symptoms which could impair an individual's ability to take protective action as set at 30,000 parts per billion. Please note that all concentration units represented here have been provided in parts per billion for consistency.

Hence, comparing all community instrument monitoring findings recorded during this assessment with the most stringent (protective) regulatory standard established for hydrogen

sulfide (at 30 ppb) has clearly indicated resultant airborne concentrations found within the community were all measured at levels significantly below allowable regulatory limits as identified during the period of this study.

As indicated during BioMax's monitoring assessment, findings of detectable levels of H₂S measured at a number of sewer manhole areas within the Point Richmond community indicated a potential correlation between observed odors, detectable H₂S levels, and possible fugitive sewer gas releases through manhole covers with cast-in holes. Due to this potential, BioMax recommends that City of Richmond personnel considers performing an inventory of sewer main access (manhole) locations and replaces covers found to have cast-in holes with solid covers. BioMax believes that the installation of plastic and/or diaphragm-type manhole cover inserts may also serve as an interim corrective measure designed to reduce or eliminate fugitive sewer gas emissions until more permanent replacement covers are established.

BioMax also believes that the City of Richmond would likely benefit from the procurement and use of portable H₂S monitoring instrumentation (such as the Jerome 631-X unit or equivalent), to be used during future reports of odor releases and to verify concentrations of H₂S levels during such incidents. BioMax believes that such equipment would serve as an invaluable investigative and maintenance tool to the City of Richmond as well as Waste Water Treatment Facility personnel wherein detected H₂S levels found would result in immediate review and corrective action. BioMax has also been asked, and is currently investigating, in the availability and cost of permanent H₂S monitoring equipment similar to that which is currently located at the Point Richmond Fire Department and maintained by the Bay Area Air Quality Management District (BAAQMD). Such equipment is used by BAAQMD to record (and data log) ambient H₂S concentrations at this community location 24 hours a day - 7 days a week wherein data is reported and available for download on the BAAQMD agency web site located at www.baaqmd.gov.

It is BioMax's opinion that the establishment of such permanent monitoring data logging equipment could be beneficial in the long term determination and study of ambient H₂S levels where located, however, BioMax also believes that the cost and maintenance of such equipment permanent may likely prove to be cost prohibitive. Whereas, it is also BioMax's position that the value and use associated with portable H₂S monitoring instrumentation would serve as a significant beneficial use to the Waste Water Treatment Facility as well as to the concerned residents of the Point Richmond community alike. In the interim, BioMax will certainly continue to gather information pertaining to the permanent monitoring station equipment, per your request, and will present such findings once received.

BioMax believes the conclusions and recommendations presented in this letter summary report are consistent with current monitoring findings, site observations, observed conditions, and current industrial hygiene control practices. Please note that the monitoring results presented in this summary report only pertain to the specific times and conditions present and encountered during the performance of this limited monitoring assessment.

Please feel free to contact me directly my offices if you have any questions regarding the information provided in this letter summary report.

Sincerely,



Michael A. Polkabila, CIH, REA
Vice President, Principal



LIMITATIONS

Please note that the professional opinions presented in this review are intended for the sole use of the City of Richmond and any designated beneficiaries. No other party should rely on the information contained herein without the prior written consent of BioMax Environmental and these parties. The professional opinions provided herein are based on BioMax's review and understanding of current site information, analytical data, and observed site conditions present within the areas and locations inspected at the time these services were performed. Recommendations provided are solely intended as items for client consideration and are not intended as a requirement and/or regulatory mandate. Hence, implementation of any of the above measures or recommendations does not, in any way, warrant the day-to-day health and/or safety of building occupants, residents, site workers, nor regulatory or building code compliance status during normal and changing environmental conditions. As all contamination, by nature, may change over time due to changing conditions and changing environments, the findings of this report are subject to change in the event that such conditions and/or environments arise. Also, the professional opinions expressed here are subject to revision in the event that new or previously undiscovered information is obtained or uncovered.

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