Project IAQ Overview and Phase I and Phase II Preconstruction Sampling Results

The Indoor Air Quality (IAQ) Management Plan and all sampling events during construction, has been and will be conducted by the lessor and its contractors as part of Lease Number GS-08P-LCO00059 between GSA and Denver EPA OC, LLC. Data collected by the lessor's contractors was provided to GSA, and after review by the GSA industrial hygiene staff, was sent to EPA Region 8. GSA's assessment of the data indicated that there were no values of analytes above any levels of concern.

The purpose of the Indoor Air Quality (IAQ) management plan is to provide the steps that will be taken during construction to ensure that the EPA project follows the Sheet Metal & Air Conditioning Contractors' National Association (SMACNA) guidelines & strategies for Best Practices in occupied buildings under construction for Indoor Air Quality. In addition to these Best Practices, the Lessor conducts pre and post construction sampling using LEED v4 standards. The goals associated with this plan are to clearly communicate the steps that should be followed to adhere to the guidelines & strategies set forth by SMACNA; to communicate the intent to use the building air handlers during construction; to outline the plan regarding the system flush out; and to set communication expectations regarding tasks that directly affect this projects IAQ. Tenets to this plan are:

Establish a feasible jobsite team-actionable approach to minimize air pollutants from:
- *Construction worker exposure*
- *Collecting within existing building systems*
- *Collecting on building materials*
- *Migrating to occupied spaces*

The Pre-Construction sampling met LEED v4 standards as specified by the lessor's consultant. As a whole, results from the test were well within the range parameters. The only constituent that did not provide results were the PM10 test for Particulates, which was found to be invalid due to improper canister setup. At the cost of the lessor, the consultant subsequently performed another PM10 test in the main Lobby and on the 4th floor near the construction area, to develop a baseline PM10 concentration. The resulting Particulate test (PM10) results showed no adverse particulates above normal range.

Under LEED v4 IAQ, the maximum allowable concentration of PM10 is 50 $\mu g/m^3$. The particle counts via this method are low and the types of particulates found are common to indoor air that would be in an office building in an urban environment. There are no regulatory or industry standard ranges for these types of particulates;however, the lab report does provide "Estimated Normal Ranges" which our building is within. When compared to the Estimated Normal Range, all particulate counts are well within normal ranges, per the lab results.

Air quality testing will continue throughout the project for both pre and post construction. We will post an executive summary on each phase that will state the condition of the indoor air at Wynkoop and provide staff any concerns discovered using this approach. If anyone wishes to see the raw data and contractors sampling strategy, please contact Mike Shanahan at 312-6121.

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Indoor Air Quality (IAQ) Testing Summary Sheet

EPA Denver Renovation Project
1595 Wynkoop St.
Denver, CO 80202

Phase 1- 3rd Floor (Pre-Testing)- January 18, 2018

Parameter	Result	Max. Limit	Value Exceeded (Y/N)
TVOC	120 µg/m³	500 µg/m³	N
CO	<9.9 ppm	9 ppm	Unknown**
4-PCH	<1.2 µg/m³	6.5 µg/m³	N
Formaldehyde	2.1 ppb	27 ppb	N
PM-10	NA*	50 µg/m³	NA*
CO_2	550 ppm	3,000 ppm	N
Caprolactam	<0.015 mg/m³	5 mg/m³	N

Phase 2- 4th Floor (Pre-Testing)- January 18, 2018

Parameter	Result	Max. Limit	Value Exceeded (Y/N)
TVOC	170 µg/m³	500 µg/m³	N
CO	<8.2 ppm	9 ppm	N
4-PCH	<1.2 µg/m³	6.5 µg/m³	N
Formaldehyde	3.7 ppb	27 ppb	N
PM-10	NA*	50 µg/m³	NA*
CO_2	610 ppm	3,000 ppm	N
Caprolactam	<0.015 mg/m³	5 mg/m³	N

NA* = Issue with PM-10 filter during sampling. Could not recover values. Recommend conduct post-testing for values to determine if below Max. Limit.

Unknown** = Value was found to be less than 9.9 ppm but could not be exactly quantified due to the limit of detection being 9.9 ppm. Actual value may or may not be below 9 ppm. Upon laboratory explanation, limit of detection was high due to atmospheric pressure differential between location of calibration (Cinnaminson, NJ approx. 79' elevation) and sample location (Denver, CO approx. 5,280' elevation). Recommended to not use TO-15 Drager CMS for CO analysis and use real-time data logging meter or other method. TO-15 analysis and Drager CMS still appropriate for all other applicable analysis including CO_2 since limit of detection is significantly different that Max. Limit.