School/Facility: Marriotts Ridge High

Location: Room 214

Date of IEQ Report Form: March 31, 2017

Date(s) Investigated: April 5, 11, 21, and 26, 2017

Date of Report: June 27, 2017

IEQ Concern:

Individual reported recurring musty odor in room.

IEQ Investigation Process:

Identify deficiencies that may impact IEQ and/or sources of odor concerns. Typically includes the following depending on the nature of concern, but not limited to:

- interview/questionnaire of concern individual(s)
- inspection above drop ceiling (condition of roof deck, pipe insulation, return air plenum)
- inspection of ventilation system (operation of variable air volume box and outdoor air dampers, check controls, measurements of carbon dioxide, temperature and relative humidity, sources near outdoor air intake, measure return and supply air volume, cleanliness of coils, liner and condensate pan)
- inspection of exterior
- inspection below drop ceiling (housekeeping, sink and floor drain traps, signs of past and present moisture concern via visual and/or moisture meter, mold growth, ensure connection of current and capping of abandoned sanitary vents, odorizers, excessive plants and fabric items, identify potential pathways, and measure volatile organic compounds, carbon monoxide, and lighting)

Findings:

- The dedicated outdoor air roof top ventilation unit (RTU) was tripped off. The RTU serves a bank of classrooms.
- The reported odor was not detected during the visits.
- The condensate lines of the RTU and FCU tie into the storm water system. During heavy periods of rain, the storm water system becomes overwhelmed and may back rain water into the FCU through the condensate line.
- The outdoor air volume being introduced via the classroom's supply air diffusers was deficient by the +/- 10% rule. The mechanical prints indicate 225 cubic feet per minute (cfm), but actually providing approximately 186 cfm from each of the two diffusers.

Corrective Actions:

- Severe cold weather in the morning can trip the freeze stat on the RTU during start up. This happens when the water in the hot water coils, cools down too fast before the hot water valve can respond. As a result, the RTU shuts down. The RTU and computer controls did not have alarms set to notify Building Services HVAC staff of unit failure. Alarm controls have been set so Building Services are aware of such conditions and can promptly respond. In addition, HVAC personnel are installing new freeze stat controllers and programming during summer break. This occurs in other RTUs serving other portions of the school and they too will be remediated at the same time.

- The RTU may be manually turned off during peak cooling season because the condensate overflows the condensate pan and enters the interior of the building. This is a result of the internal condensate trap being too short and impacting the pressurization of the trap allowing water not to freely drain. Building Services plans to install proper sized drain traps during summer break.

- The condensate drains of the FCUs and RTUs throughout the school are connected to the storm water system. As a result, during short heavy rain, water may back up into the FCUs and wet classrooms to a certain degree. In addition, in theory, under certain conditions, odors may emanate from the storm water system into the condensate drain line and into the FCUs and RTUs. Building Services has a project going out to bid to have backflow preventers installed this summer break to resolve the concern.

- Building Services HVAC shop will evaluate the outdoor air CFM deficiency. If not able to address internally, the services of a mechanical contractor will be rendered to review and address during the summer break.

- Office of the Environment personnel may work from the school on prone days in order to detect the odor and confirm a source.