MEMO

To: Maidencreek BOS
From: Thomas S. Unger, P.E.
Date: 4/11/18

On Monday April 3, 2018 SDEI performed a walk through evaluation of the Maidencreek Township Municipal Building's HVAC system. The purpose of the evaluation was to determine if there was a simple solution to remedy a problem with fumes from the facility's service garage area migrating to the facility's office spaces.

Per our walk through, it appears the office portion of the facility operated at a negative pressure with respect to the garage area. This differential pressure forces fumes to migrate from the garage area to the office space.

The existing HVAC system for the office space utilize horizontal gas fired furnaces with add on split system air conditioning. The systems are fully ducted but not sealed for low leakage. There is no outside air introduced into the systems as the code required ventilation appears to be provided by natural means through operable windows.

The existing HVAC system for the garage is horizontal gas fired unit heaters. There is no outside air introduced into the garage, as there are operable overhead doors. No localized exhaust systems exist within the garage.

Before anything is done with the HVAC system it is recommended steps be taken to tighten the boundary between the spaces. By sealing the partition that forms the boundary and reducing the open space or air gaps, the fume transport airflow can effectively be reduced.

Once the boundary is made as tight as possible, the fume issue can be further remedied by reversing the pressure relationship between the office space and the garage. The office space should be made to operate at a higher air pressure with respect to the garage area. This can be accomplished by either increasing the office pressure or decreasing the garage pressure.

To increase the office pressure the Township would have to introduce ventilation or outside air through the HVAC equipment. However due to the amount of air that would be required this cannot be done with the existing equipment as it would not have adequate heating and cooling capacity. This would require replacing the existing office HVAC entirely; which would likely cost in the six figure range.

To decrease the pressure within the garage space exhaust fans could be added to capture the fumes at their source and expel them outside of the building. These fans could be operated intermittently when fume generating work is being performed. However, during operations in winter months the additional exhaust will draw unconditioned air into the building. This unconditioned air will require additional heat be added to the garage area. While adding