EXECUTIVE SUMMARY

The purpose of this report is to analyze the three energy recovery units that supply ventilation air to the new student housing project soon to be built at the Mount St. Mary's University and to determine whether they are compliant with ASHRAE Standard 62.1-2004 ventilation requirements at design conditions.

This new student housing complex is slated to begin construction later this month at the Mount St. Mary's University in Emmitsburg, Maryland and should be completed by the fall of 2007. When finished, the building will stand three stories tall at approximately 60,000 SF, and it will be comprised primarily of 4-person suites all with operable windows.

This dedicated outdoor air system (DOAS) is a constant air volume (CAV) system that consists of three energy recovery units and thirty-six geothermal heat pumps. Each of the three energy recovery units has the capacity to supply 1050 CFM of 100% ventilation air tempered by exhaust air; there is no mixing of ventilation air and exhaust air prior to the introduction of the ventilation air into the spaces served by the units. The majority of these spaces served are 4-person suites, and there are also a handful of 2- and 3-person suites, lounges, laundry rooms, and corridors that receive ventilation. Each of these spaces is equipped with a geothermal heat pump that receives the ventilation air and mixes it with recirculated space air, which is then conditioned and reintroduced into the space served by the unit. Each energy recovery unit serves approximately a third of the building, and for this report, zones have been categorized into regions served by specific heat pumps.

After following the Ventilation Rate Procedure as outlined in Section 6.2 of AHSRAE Standard 62.1-2004, it is apparent that the three energy recovery units alone do not introduce enough outside air to the building to meet ventilation requirements. The building requires approximately 3400 CFM of ventilation air and is receiving only 2850 CFM, making the system insufficient by approximately 15%. However, when natural ventilation through the operable windows is analyzed and taken into account, it quickly becomes evident that the building would receive more than adequate ventilation to all crucial spaces. Therefore, the ventilation system, when analyzed in conjunction with natural ventilation, is compliant with ASHRAE Standard 62.1-2004 as it is described in Section 5.1.1 of the standard.