Alliance Environmental Group, Inc.

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(401) 732-7600

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Angels' Share

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Angels' Share

The process of creating the distinct, smooth taste of many distilled spirits includes aging in wooden barrels today, just as it has for centuries. This aging process is an art as much as a science and it is widely known that ethanol evaporates through the wooden barrels as this process is taking place. This loss of ethanol is called the "angels' share". These ethanol emissions can be very significant depending on the size of the warehouse, but they can not be controlled easily since the aging warehouses are not climate controlled and are generally open to the outside atmosphere. Since ethanol is a VOC (volatile organic compound), emissions can lead to photochemical production of ground-level ozone, one of the Criteria Pollutants monitored and controlled by the United States Environmental Protection Agency (USEPA). However, since these emissions are considered fugitive they are not included when evaluating the emissions threshold for PSD (Prevention of Significant Deterioration) applicability and therefore these emissions do not receive the same level of regulatory evaluation as similar emissions from point sources.

This angels' share is being blamed for impacts to surrounding properties in many cases because of suspected growth of a black fungus believed to be Baudoinia, which is sometimes called "whiskey fungus". In at least two areas residents have filed lawsuits regarding these impacts: (http://munchies.vice.com/articles/kentuckys-whiskey-fungus-problem-is-out-of-control and http://www.theolympian.com/news/business/article28768783.html).

These impacts are also pushing regulators to consider some form of emissions control for aging warehouses even though the emissions have heretofore been considered "fugitive emissions". At least one brandy distiller in California has installed an RTO (Regenerative Thermal Oxidizer) to control emissions. This technology is an effective method of controlling VOC emissions such as ethanol,

however since this technology requires heating all of the air flowing through the control device, it works best when high concentrations of VOC can be fed to the RTO. Large amounts of supplemental heat are required if the concentrations of VOC are not high enough. Because of the method of aging in barrels and the design of existing warehouses it is very impractical to design a method of collecting high concentration VOC vapors to feed an RTO and therefore any application of RTO technology to existing warehouses would likely be very expensive on both the capital and operating costs.

AEG is following these developments closely and we are evaluating other control strategies to mitigate or reduce impacts. One control technology that we believe will be effective and usable at existing warehouses is to duct vapors from existing vents through a specially designed control device using biological removal of ethanol prior to any air escaping to the atmosphere. AEG has designed a system that uses this technology and can be used either with or without imparting negative pressure on the warehouse to draw ethanol vapors. Contact RHittinger@AllianceEGI.com with any questions or for more information.

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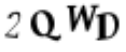

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Fax: (401) 732-7670

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