Exhibit V

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EXPERT OPINION ON COSTCO'S PROPOSED GASOLINE MEGA-STATION AIR QUALITY

UPDATE and ADDENDUM April 8, 2013

Submitted to Martin L. Grossman, Examiner
Office of Zoning and Administrative Hearings

Submitted by Henry S. Cole, Ph.D.
On behalf of Stop Costco Gas Coalition

1.0 Introduction: This submittal is an update on my previous (March 26, 2013) expert opinion on Costco's application for a special zoning exception required to establish a large gasoline fueling station at a location in the Westfield Mall. This update provides additional clarification and information that further supports my judgment that:

- Costco's air quality assessment significantly underpredicts the impact of its proposed gasoline mega-station on the air quality of the neighborhood including, residents, Mall users, Mall workers, members at the Kenmont Swim Club and the severely handicapped and chronically ill children attending the Stephen Knolls School.

- Costco has failed to provide a credible or scientifically valid analysis showing that its proposed facility station will not harm public health or welfare—and therefore does not meet Montgomery County's requirement for a zoning variance needed for the project.

- The weight of the evidence suggests that the gas station will if allowed have an adverse impact on the health of area residents and others.

As discussed in my March 26, 2013 submittal, evidence based on Sullivan Environmental Consultants (Sullivan) air quality studies shows that current respirable particulate levels in the area of the Westfield Mall already exceed EPA's annual standard for PM2.5. In addition, short term PM2.5 levels currently consume more than 80 percent of EPA's 24-hour maximum standard of 35ug/m^3.[1] In addition:

- Sullivan's modeling is highly likely to underpredict actual annual and 24-hour concentrations of particulates (and other pollutants) to which the public would be exposed.
- Sullivan's approach is inconsistent with EPA guidance known as the "conformity rule" as applied to analyses associated with new traffic related projects that affect localized "transportation-related hot spots." This rule requires that new facilities not make it more difficult to attain or maintain ambient air standards and thereby create unhealthful exposures. (See Section 2).
- Sullivan uses a motor vehicle emissions model, Mobile 6, that EPA no longer accepts for transportation related studies; this model has serious flaws especially with regard to PM2.5 emissions. (See Section 2.1)
- There is ample evidence that fine particulates cause health effects at levels well below the national ambient standards. (See Section 3).

2.0 EPA's Conformity Rule as Applied to Transportation Hot Spots: An important provision of the Clean Air Act (CCA) is known as the conformity rule. This rule is designed to ensure that federal actions in nonattainment and maintenance areas do not interfere with a state's plans to meet national standards for air quality. [2,3] Note the following EPA descriptions of conformity rule as applied to local, small scale proposals:

> *"Design values are a fundamental component of PM hot-spot analyses, as they are the values compared to the NAAQS and between build and no-build scenarios. In general, a hot-spot analysis compares air quality concentrations with the proposed project (the build scenario) to air quality concentrations without the project (the no-build scenario). The conformity rule requires that the build scenario not cause or contribute to any new violations of the NAAQS, increase the frequency or severity of existing violations, or delay timely attainment as compared to the no-build scenario (40 CFR 93.116(a) and 93.123(c)(1)).*" (Emphasis added.) [4]
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> *A hot-spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized pollutant concentrations resulting from a new transportation project and a comparison of those concentrations to the relevant air quality standard. A hot-spot analysis assesses the air quality*

[1] See Sullivan modeling analysis of January 16, 2013; maximum modeled 24-hour concentrations exceed 28- ug/m^3.

[2] This final rule requires PM2.5 hot-spot analyses for projects of air quality concern in PM2.5 nonattainment and maintenance areas at all times—both before and after a PM2.5 SIP is submitted, *Ibid.*, http://www.epa.gov/fedrgstr/EPA-AIR/2006/March/Day-10/a2178.pdf

[3] (Montgomery County as part of the Washington, DC-Maryland-Virginia Air Quality region has applied to change its status from non-attainment to a maintenance area for PM2.5.)Washington Council of Governments (COG), Washington DC-MD-VA PM2.5 Maintenance Plan, DRAFT 01-04-13.
http://www.mwcog.org/environment/air/downloads/PM/Draft%20PM%20MP%2001-04-13.pdf

[4] Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas: EPA-420-B-10-040, Dec. 2010. http://www.epa.gov/otaq/stateresources/transconf/policy/420b10040.pdf

impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts." [5]

EPA also notes that the project scale allows the user to perform micro-scale analysis of emissions on individual roadway links or locations where emissions from vehicles starts or extended idle activity occur.

Sullivan often puts forth the rationale that the gas station would have only a small incremental effect on cumulative concentration relative to background. However, the conformity rule is clearly aimed at protecting public health local areas where concentrations are already above or approaching national ambient standards, as is the Westfield Mall area.

2.1 Sullivan uses an obsolete and inaccurate model to calculate vehicle emissions. EPA clearly requires that applicants use MOVES (Motor Vehicle Emissions Simulator) rather than Mobile 6 to estimate automotive emissions for areas of congestion. The Agency made MOVES available as early as 2007 to replace Mobile 6 in order to eliminate its serious flaws and inaccuracies. The flaws are especially serious with regard to PM2.5, the pollutant of greatest concern with regard to existing and predicted conditions. The following excerpt describes EPA's reasons for replacing Mobile 6.

"While MOBILE6.2 has the same input options for PM as for the other pollutants, most of those input options do not have any affect on PM2.5 or PM10 emission estimates calculated by the model. For example, there are no temperature, humidity, or altitude corrections in MOBILE6.2 for PM2.5 or PM10. Speed, driving cycle, engine starts, and all of the other activity input options similarly have no affect on PM2.5 or PM10 emissions in MOBILE6.2. The only conditions that do affect PM2.5 or PM10 emissions in MOBILE6.2 are fleet and fuel characteristics . . .

"However, at the micro-scale level needed for hot-spot analyses, these limitations become very significant. Activity factors such as speed, driving cycle, and number and distribution of engine starts per day do have an important impact on actual PM2.5 or PM10 emissions from motor vehicles. Most, if not all, transportation projects that would need to be analyzed would result in changes in these activity levels that would need to be incorporated in credible hot-spot analyses. For example, the construction of a highway interchange would likely result in significant changes to average speeds, driving cycles of vehicles, idling time, etc. in the immediate vicinity of the interchange. The effects of these changes are an important and necessary component of estimating the impact of the new interchange on nearby PM2.5 or PM10 concentrations." [6]

The same document goes on to say that Mobile 6 cannot simulate these factors. Despite EPA's guidance calls for the use of the new MOVES emissions model Sullivan uses outmoded Mobile 6.

A study conducted by the Coordinating Research Council clearly shows that MOVES, with a more realistic treatment of traffic flow, provides much higher estimates of PM2.5 emissions—

[5] U.S. EPA, March 10, 2006, Part III, 40 CFR Part 93, *PM2.5 and PM10 Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New PM2.5 and Existing PM10 National Ambient Air Quality Standards; Final Rule.* http://www.epa.gov/fedrgstr/EPA-AIR/2006/March/Day-10/a2178.pdf

[6] Federal Register / Vol. 71, No. 47 / Friday, March 10, 2006 / Rules and Regulations pp. 12498-12499.

roughly three times higher than Mobile 6 for several large cities.[7] However, the differences are likely to be far more pronounced in exactly the situations of a gasoline mega-station during high-use periods with lines of idling cars and stop and go traffic entering, using and exiting the gas station and along the access roads. In such situations, residents just south of the Ring Road, Mall users and students at the Stephen Knolls School are likely to be exposed to much higher respirable pollutant concentrations than Sullivan's model predicts.

Further evidence for the differences between MOVES and Mobile 6 for slow speeds and idling is provided in Attachment 1. The figure from the Federal Highway Administration shows that at very low vehicle speeds, MOVES PM2.5 estimates are more than ten times higher than those of Mobile 6, the model used by Sullivan.

At the Planning Board Hearing (February 28, 2013), David Sullivan stated that his firm didn't use MOVES because a new version[8] of the model was not yet released. At other times Mr. Sullivan has said that EPA's grace period (which expired in December 2012), allowed the use of Mobile 6 for studies that were underway. However, neither of these explanations is valid. MOVES 2010a was available in 2010 as was ample EPA guidance on the compelling reasons to use MOVES rather than Mobile 6.

2.2 Sullivan assessments compound the errors: In my professional judgment, several additional deficiencies in Sullivan's modeling coupled with those previously described work to compound the underprediction of harmful particulate exposures. Consider that the firm's modeling:

- Uses Mobile 6 in its estimates not only for traffic using the proposed gas station, but uses the same flawed model to estimate emissions resulting from roadway traffic in areas surrounding the Mall; this compounds underprediction of cumulative concentrations.

- Fails to include non-Costco emission sources (e.g. vehicles using other parts of the Mall including diesel truck deliveries).

- Fails to model how the impact of the gas station particulate emissions (and those of other sources) would affect pollutant concentration exposures within the Mall. This omission is serious since the evidence presented in Sullivan's assessments show frequent winds from the south – directions which would transport gas station related emissions into the Mall areas to the north. (See March 26, 2013 Submittal).

Despite these problems, most of Sullivan's modeling applications show that the cumulative impact of the gas station (combined with other sources) will exceed EPA's national annual ambient standard for PM2.5 (fine particulates).

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[7] Coordinating Research Council (CRC) a non-profit group that conducts research for the petroleum and automotive equipment industries for PM2.5. The 2010 report can be found at: http://www.crcao.com/reports/recentstudies2011/E-68a/Final%20CRC%20E-68a%20Report_V6.pdf

[8] The new version of the model is MOVES 2010b. However, the EPA allows the use of the earlier MOVES 2010a and states that differences in terms of results are minimal.

3.0 Particulates and health impacts. The previous sections demonstrate that the proposed gas station would further aggravate respirable particulate concentrations (PM2.5) in the Westfield Mall and surrounding neighborhoods. Thus residents and people who frequent the area (e.g. students, swim club members, shoppers, Mall workers, etc.) would be exposed to increased risks of adverse health effects. Note also:

- The gas station would be located within 125 feet of the nearest residences within 870 feet of the Stephen Knolls School.
- Emissions associated with Ring Road traffic going to and from the gas station (and warehouse) will be released much closer to the school than the gas station fueling area. The school and its playground are located within 70 feet and downslope[9] of the Ring Road. Children attending the school represent a highly sensitive population particularly vulnerable to pollutant exposures.

The people who are likely to be exposed over the longest duration and exposed to the highest concentrations repeatedly and over long durations are those who *live* closest to the site. Such persons include the elderly, infants, and chronically ill residents living in adjoining neighborhoods (segments of the population most vulnerable to the effects of airborne pollution). Some of these residents are likely to be exposed for a high portion of the time over many years and thus are potentially at the highest health risk among the residents, visitors, or workers in the area of the gas station.

Submittals by health experts Dr. Jison and Dr. Breysse (retained by the Kensington Heights Civic Association, KHCA), provide abundant information on the adverse health impacts that occur when people are exposed to PM2.5—even at levels lower than the current annual standard of 12ug/m^3.

EPA scientists (N. Fann et al., 2012) present evidence assembled from numerous scientific studies found that tens of thousands of lives in the U.S. could be saved by lowering the annual PM2.5 standard from its current 12ug/m^3 to 5ug/m^3.[10] In other words concentrations below 12ug/m^3 clearly have adverse effects.

4.0 Conclusion: In my judgment, this evidence along with that presented in Section 2, demonstrates that Costco submittals on air quality fail to demonstrate in a scientifically valid manner that its proposed facility, in its planned location, can meet the "no harm" requirement for a zoning variance.

[9] During conditions of light winds and stable atmospheres, flow is likely to be downslope from the Ring Road toward the school. (See further discussion in Section 5.3)

[10] Fann, N. et al., "Estimating the National Public Health Burden, Associated with Exposure to Ambient $PM_{2.5}$ and Ozone," *Risk Analysis,* Volume 32, Issue 1, pages 81–95, January 2012
http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.2011.01630.x/abstract

ATTACHMENT 1: PARTICULATE EMISSIONS FOR MOVES VERSUS MOBILE 6 UNDER SLOW SPEEDS, STOP AND GO AND IDLING

1. Excerpt from: *US EPA: EPA Releases MOVES2010 Mobile Source Emissions Model: Questions and Answers:* http://www.epa.gov/oms/models/moves/420f09073.pdf

"For PM2.5: EPA's estimate of mobile source PM2.5 emissions using MOVES2010 is significantly higher compared to MOBILE6.2 for both light- and heavy-duty vehicles and for all of the urban areas modeled. For passenger cars and light trucks, these increases are based on data developed as part of EPA's Kansas City study, which showed much higher PM2.5 emissions at low ambient temperatures than previously known. For heavy-duty trucks, MOVES2010 incorporates new data from a large study of trucks conducted by the Coordinating Research Council (known as the CRC E-55 study) which includes deterioration effects on in-use emissions. MOVES2010 also models the impact of vehicle speed and load on PM emissions, showing very high rates of PM generation in stop-and-go traffic conditions. This high emission rate consists of the emissions produced while the engine is under increased load while accelerating (i.e., the "go" phase of stop-and-go driving) as well as the emissions produced while the vehicle is stopped and therefore not accumulating any mileage, thus resulting in higher overall emissions per total mile driven."

2. The following figure is a report by Michael Claggett, Ph.D., *Federal Highway Administration:* "Implications of the MOVES2010 Model on Mobile Source Emission Estimates." It can be found on EPA's site at: http://www.epa.gov/ttnchie1/conference/ei19/session6/claggett2.pdf