BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

PO Box 88 ~ Glendale Springs, North Carolina 28629 <www.bredl.org> Phone 336-982-2691 ~ Fax 336-982-2954 ~ Email bredl@skybest.com

September 15, 1999

via facsimile: (617) 918-1505

Bob McConnell
1 Congress Street/CAQ, Suite 1100
Boston, MA 02114

Re: EPA Draft Reports on Hot Mix Asphalt Plant Emissions
Plant "C" MRI Project No. 4951-04 4/23/99
Plant "D" MRI Project No. 4951-04 4/8/99

Dear Bob:

I write to comment on the EPA's testing for asphalt fugitive emissions. I have reviewed documents which formed the basis for the tests including:

- Emissions Testing at a Hot Mix Asphalt "Plant C" Los Angeles, California Draft Report
- Emissions Testing at a Hot Mix Asphalt "Plant D" Massachusetts Draft Report
- Evaluation of Emissions from Paving Asphalts [EPA-600/R-94-135, 8/94]
- Enclosure: Requirements for Proposed Emission Test of a Hot Mix Asphalt Plant
- Evaluation of VOC Emissions from Heated Roofing Asphalt [EPA-600/2--91-061, 11/91]
- Emissions Testing at a Hot Mix Asphalt Plant, All American Asphalt, MRI Report 3/10/98
- Site-Specific Test Plan for Manual Emissions Testing at the HMA Plant Load-Out Bay Ventilation System at AAA, Irvine, CA, PES, March 1998 p:\RO12.001\SSTP

The uncontrolled quantity of fugitive emissions generated at asphalt loadout depends on a variety of factors, each of which present conditions that can influence the outcome and the reliability of the test. For the purposes of fugitive emissions estimatation, the tests at the AAA plant in Irvine, California may be fatally flawed.

1) The quantity and quality of fugitive emissions at a typical asphalt plant depends on the volatiles content of the asphalt cement. This depends on where the asphalt cement comes from and how it was produced. The calculations seem to attribute differences in asphalt fume species only to plant operating temperature. Average THC emissions were calculated for each run and varied over a wide range of concentrations. The average range in Plant D was 3.1-3.6 ppm and the high values range from 7.7-8.3 ppm. The high average is 2.3 times higher than the average. What is lacking is a study of the effect of where the asphalt came from, the conditions at the refinery, and asphalt cement additives.

Volatile chemical content varies with the asphalt cement supplier and even with each delivery from the same supplier. For example, asphalt from a refinery that includes hydrocracking and isomerization steps may contain more polyaromatic hydrocarbons than one that relies mainly on distillation. In her 4/27/98 memo to EPA, Dr. Carolyn Eberhard states, "Asphalt cements are not going to be the same everywhere in the country or even at one facility (Ca Valley AR-4000

shows variation from volatiles 0.81 for AAD1 to 0.12 for ABD)." This higher level is nearly seven times higher than the lower level. Tests were needed on asphalt cement manufactured at different times in order to determine the effect of oil refinery operating conditions on the volatiles content. Unfortunately, EPA seems to have ignored advice on this subject and did not eliminate the uncertainties caused by asphalt source and refinery conditions.

> *The plant uses two different kinds of liquid asphalt, AR-4000 and AR-8000. AR-4000 is a softer asphalt with a higher volatile content and is used approximately 90% of the time. The percent by weight of liquid asphalt in the mix varies from 4.8% to 6.0% depending on the size of the aggregate (the smaller the aggregate, the higher the liquid asphalt content).* (EPA Draft Report Plant C page 2-1)

> *Average THC emissions were calculated for each run, as well as the maximum and minimum for each run. The average concentration for the three runs was fairly consistent, falling between 3.1 and 3.6 ppm. High concentrations for the three runs ranged from 7.7 to 8.3 ppm.* (EPA Draft Report Plant D page 4-1)

2) Fugitive emissions vary with the temperature of the asphalt when it is loaded into trucks. Emissions increase with temperature. Also, Asphalt fumes generated at a higher temperature contain different compounds than asphalt fumes generated at a lower temperature. The higher the temperature, the higher the molecular weights of the volatile species. Additives used in asphalt cement require higher temperatures in order to be effective. These temperatures range as high as 425-450 degrees F. This would clearly increase the total level of volatile organics, change the fraction of low/high molecular weight VOC's, and raise the level of heavy metals emitted either as an aerosol or attached to fine particulate matter. I saw no provision for determining these unknowns in the documents I reviewed. How did EPA account for volatile species differences caused by temperature?

> *Five 200-ton heated silos sit on top of a load-out tunnel. The silos serve as a holding station between production and the loading of the asphalt cement into transport trucks. The asphalt cement in storage can have a temperature up to 160* ***degrees*** *C (320* ***degrees*** *F). The load-out tunnel is approximately 183 ft long. During a full load-out schedule, trucks enter the tunnel approximately every 3 min. Single bed trucks hold approximately 21 tons of asphalt cement. Dual bed trucks (i.e., a truck and trailer) hold approximately 25 tons. The temperature of the asphalt cement as it drops from the silo into the truck is approximately 300* ***degrees*** *F.* (EPA Draft Report Plant C page 2-1)

3) Ambient wind velocity may cause changes in fugitive VOC's emitted during loadout. There is no ambient wind in the tunnel of the AAA plant. This is a flaw in the Irvine site which may not be accounted for in a test condition. Unlike the vast majority of plants where the asphalt is loaded

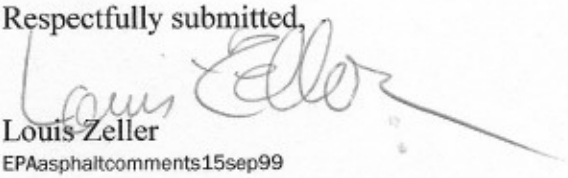
in the open, the tunnel eliminated the effects of wind blowing past the falling stream of asphalt or the loaded truck. The tunnel therefore reduced fugitive emissions. EPA has not simulated conditions in unenclosed plants.

> *The site selected for performing the emissions tests performs all truck loading operations inside a tunnel approximately 183 ft in length with open doorways at both ends. During loading, emissions are captured by activating a double-slotted capture hood located at each individual silo. Thus, the tunnel, ventilation system, and capture hoods work together to form a near-total enclosure for determination of mass emissions for the loading operations.*
> *The selected test site, however, did not meet all of the criteria for a permanent total enclosure (PTE) as defined by EPA Method 204, "Criteria for Verification of a Permanent or Temporary Total Enclosure," Federal Register, Vol. 62, No. 115, June 16, 1997. Specifically, the chosen test site did not meet all the criteria for building geometry, or average face velocity across the two doorways.* (EPA Draft Report Plant C page 1-1)
>
> *Prior to testing at the selected site, a Total Temporary Enclosure (TTE) was constructed around the truck load-out area, thereby allowing "fugitive" emissions to be captured and measured as a "source." The TTE was built to meet criteria specified in EPA Method 204, and served the sole purpose of capturing fugitive emissions for source testing purposes.* (EPA Draft Report Plant D page 1-1)

4) Fugitive emissions vary with the time that the hot mix is in the truck bed from loadout to plant property line. Also, fugitive emissions from trucks traveling from the plant site to the job site depend on the distance traveled. These emissions, although dispersed over a distance, add to the total effect of the permitted asphalt plant on the people living nearby and far from the plant. Ambient temperature affects the buoyancy of heated air emissions. Wind, weather, geography, and buoyancy determine where the plume goes. The SCREEN3 model assumes average ambient temperature, or default value, of 68 degrees-F (293K). But the average ambient temperature in, for example, Boone, North Carolina is not 68 degrees year round. During summer months it is higher, in early spring and late fall it is much lower. This assumption matters particularly when standards specify daily or hourly limits which may not be exceeded without risk to public health. EPA failed to address this in the draft report.

Thank you for the additional time to submit these comments. I appreciate the work you have put into this long process.

Respectfully submitted,



Louis Zeller
EPAasphaltcomments15sep99