

September 27, Missouri Air Conservation Commission

I would like to thank you for the opportunity to be here today. It is interesting that the Clean Air Act was put together as a result of midnight darkness coming to noon and now I am here to talk about noon brightness coming to midnight. Light pollution is a problem plaguing our natural nighttime sky. As highlighted in our one-page discussion sheet:

- 75% of Missouri State Parks have lost the ability to see around half its visible stars and the Milky Way.
- Light pollution is increasing in the US at 5%-10% annually
- The Kansas City and St. Louis Metropolitan areas alone waste an estimated 164.5 million kWh per year just in light shining into the sky
- All living things exposed to the sun have evolved natural circadian rhythms to govern when they rest, feed and cell regeneration. Extensive research has shown that artificial night lighting can have an effect upon all living things.
- In humans, exposure to light at night has been shown to suppress production of a natural cancer-fighting hormone. Light shining into bedroom windows is a nuisance and leads to poor sleep. This in turn leads to such health problems as high blood pressure, diabetes, depression and obesity.

So, how do we resolve this problem? Let's suppose a state park like Watkin's Mill decided it wanted its campers to see the Milky Way at night. They might install better lighting, lights that shine down and emit less glare. Would it bring back the stars? No. So, having only a few lights they get desperate and shut them all off. Certainly that would bring back the stars! But, the stars haven't returned.

Why? The National Park Service has traced light pollution in National Parks from cities as far away as a couple of hundred miles. What happens in Las Vegas apparently doesn't stay in Las Vegas. So how does Watkins Mill bring back the Milky Way? It must manage light emissions on a regional basis and that is why I am looking for your feedback today. To start getting control of problematic light emissions in our protected areas, we are looking at developing legislation that limits the night sky brightness to twice the natural nighttime sky brightness. Additionally, we want 90% of our protected areas to be at less than 30% over natural nighttime sky brightness. Finally, we are looking at long-term goals to bring down the night sky brightness even further.

How are other states addressing this problem? Serc Online mentions 27 states that have existing or proposed light pollution laws. Like many cities and building codes such as LEED 2.1 these place restrictions on light being directed into the sky. To my knowledge, if passed, ours will be the first quantitative limit on light pollution. It will be up to the group managing this to develop regulations and monitor progress against these limits.

Federal Help? As you are aware the Clean Air Act has declared:

“Congress hereby declares as a national goal, the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution”

It allows the administrator flexibility to analyze and classify new pollutants such as nano particles and restrict manmade emissions of these pollutants. With over 25% of our Class 1 Federal areas having severe light pollution problems, and light pollution growing, I believe eventually Federal limits will be established.

How can light pollution be measured? The light pollution overlay, used to determine the pollution levels in our state parks, was put together by NOAA and other scientists using the U.S. Air Force Defense Meteorological Satellite Program readings. On the other side of the spectrum, handheld Sky Quality Meters can be obtained for around \$120. These Provide localized readings, and are able to quickly determine the compliance of a location.

I look forward to your comments and questions, thank you for your time.

Robert Wagner