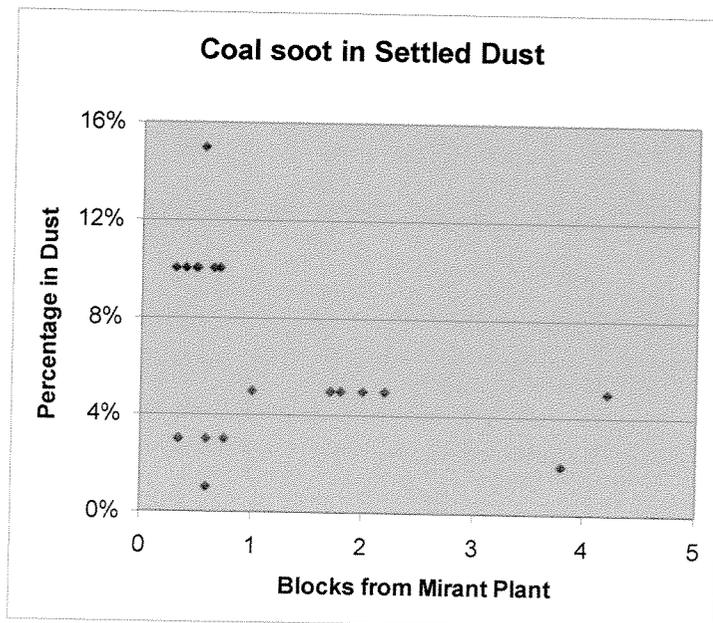




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I have reviewed the report entitled “Collection and Analysis of Particulate Fallout Samples near Coal-Fired Power Plant in Alexandria, Virginia,” dated October 13, 2006 and submitted to the City of Alexandria by Eastmount Environmental Services, LLC. The report is a summary of the analyses of dust samples collected from exterior locations and inside residents’ homes in the communities adjacent to and nearby the Potomac River Generating Station (“PRGS”). The Eastmount report shows that coal soot—flyash, coal ash and coal dust—is pervasive in these communities with the amount of coal soot increasing markedly the closer a sample location is to the PRGS.¹



Amount of coal soot in settled dust samples collected on surfaces on the outside of residences located adjacent to and up to four blocks from the PRGS. All samples contained coal soot, and the percentage of coal soot in the dust samples increased as the distance from the PRGS decreased.

¹ Flyash is the primary end-product of coal combustion; coal ash is partially combusted coal; coal dust is particles of uncombusted coal. In the Eastmount report, energy dispersive x-ray (EDX) spectra show the metal components of the flyash, the partially combusted coal ash, and the unburned coal.

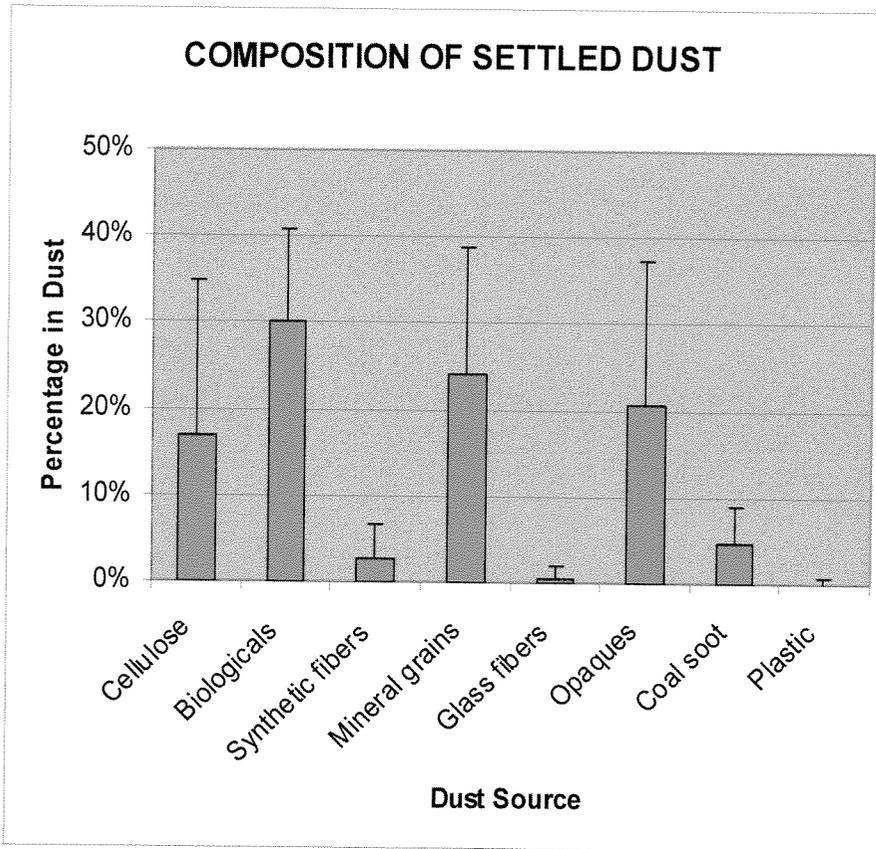
The analyses of these particulate samples confirm that coal burned by the PRGS is accumulating as settled dust both outside and inside of Alexandria's residences.² Of the outdoor samples collected within four blocks of the PRGS, 100% contained identifiable coal soot and 75% consisted of at least 5% coal soot. Of the indoor samples, 86% contained identifiable coal soot and, for nearly half of those samples, 2% of the entire sample was coal soot. The analysis also confirms that coal soot in the Alexandria settled dust is common. If coal soot deposition were intermittent or uncommon, it would be washed away by the rain or removed by housecleaning or other activities and, therefore, generally undetected.³

Except for the presence of the coal soot, the settled dust in these Alexandria communities resembles other mid-Atlantic region settled dust samples. Such samples typically show biologics (*e.g.*, pollen, skin flakes, hair), cellulose (paper fibers), mineral grains, synthetic fibers, and dust from vehicles such as paint chips, tire fragments and rust.⁴ Remove these benign components from the Alexandria samples and there is only coal soot--with the same general composition of the hazardous metals as the coal itself, except for some metals which become enriched in the flyash. The primary inhalation risks in these samples are the flyash and coal ash identified in the Eastmount report.

²“Settled dust” is the particulate matter that collects on exterior and interior surfaces. The composition of settled dust depends on a building's or site's location and surroundings as well as a building's structure and activities conducted within and around the building.

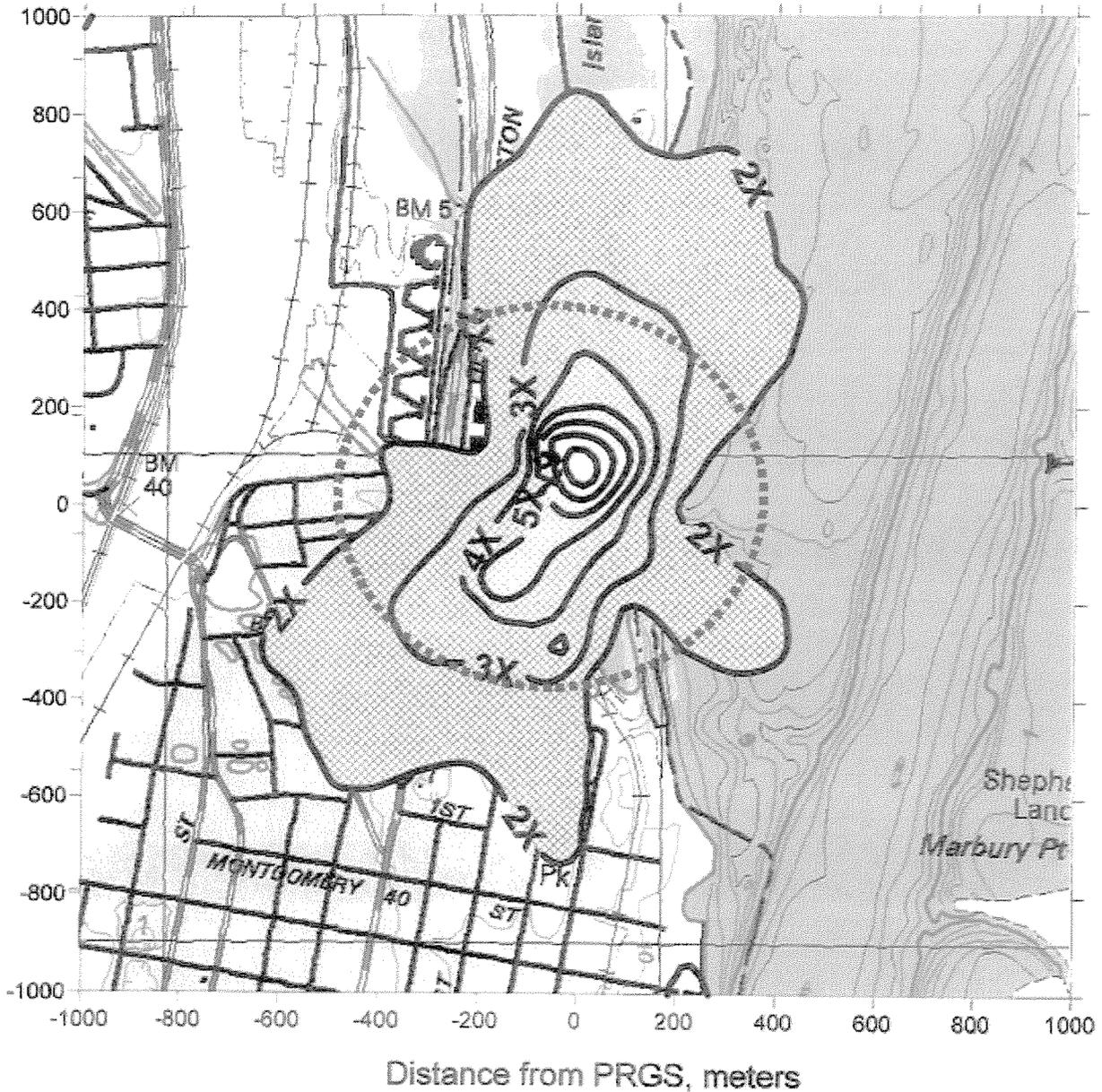
³ I verified that the dust samples were collected under wet weather conditions both from precipitation on the day before the sampling date and intermittent precipitation on the day of the sampling. Under such conditions, it is remarkable that such levels of coal soot were detected in the outdoor samples.

⁴ Yang, C.S., Dougherty, F.J., Lewis, F.A., *et al.* Microscopic Characterization of Settled Dust Collected in Office Buildings in the Mid-Atlantic Region, Proceedings of IAG 92 Environment for People. Atlanta: ASHRAE 1992, pp. 191-196, as cited in Macher, J.M. (2001) Review of Methods to Collect Settled Dust and Isolate Culturable Microorganisms. *Indoor Air* 11(2): 99-110.



Origins of the components of settled dust collected either on the outside or inside of residences located adjacent and up to four blocks from the PRGS. Bars show the mean +1 standard deviation of 25 samples. Dust sources classification: a. Cellulose (vegetative, paper, paper and cotton fibers); b. Biologicals (pollen, organic debris, hair, trichome, spore, spore-related material); c. Mineral grains; d. Opaque (non-combustion vehicle dust, non-soot organic/inorganic, pigmented paint residue, rust, welding spheres); e. coal soot (flyash, coal ash and coal dust); f. Synthetics (synthetic and glass fibers, plastics).

Unfortunately, the particles landing outside and inside Alexandria residences are the tip of the iceberg when it comes to the total number of particles emanating from the PRGS. This is in terms of both geographic scope and in relation to total suspended particles. Using actual weather conditions and PRGS's activity records, modeling studies have shown alarming levels of coal particulates in Alexandria's air, frequently exceeding health based particulate air pollution limits, and in a greater radius around the PRGS than the area in the Eastmount report.



Legend: The dotted circle shows the area of settled dust collection, while the shaded areas show the air quality impact for particulate matter less than 2.5 mg/m³ (PM_{2.5}) from the AERO Engineering August 2005 report. Maximum 24-hour PM_{2.5} impacts including background are shown as multiples of the old national air quality standard of 65 mcg/m³. The 24 hour standard was recently lowered to 35 mcg/m³ because of adverse health effects including increased deaths for heart and lung diseases, increased hospitalizations and emergency room visits and worsening COPD and asthma. The area of adverse impact from the PRGS extends well beyond the area of settled dust collection.

Settled dust particles are a small fraction of total airborne particles generated by coal combustion which primarily creates fine particles. “Terminal Settling Velocity” quantifies the tendency for particles to settle to the ground or remain suspended in the air. Fine combustion particles remain suspended in the air and are drawn deep into the lungs of residents (the human nose is unable to filter out fine particles) where they cause significant harm. A recently released study published in the New England Journal of Medicine provides yet more evidence of the link between the deadly soot observed in these Alexandria communities and the increased risk of cardiovascular death. This is in addition to the extensive survey and assessment by the U.S. Environmental Protection Agency’s Clean Air Scientific Advisory Committee of scientific studies that show the link between adverse and severe health impacts and exposure to fine particulate matter.

Flyash is the mineral residue that contains aluminum, iron and heavy metals. This mineral content exacerbates the problems with respect to the suspended fine particles as well as the settled particles. Settled dust particles create an accumulating burden of metal rich coal soot in soil and river beds. Twenty years ago, settled dust analyses showed that lead from gasoline combustion products contributed to half of the lead in house dust (the other half from lead paint). Banning lead in gasoline dramatically improved children’s blood lead levels nationwide. Similarly, this settled dust analysis points to the PRGS as the source of Alexandria’s pervasive, accumulating outdoor and indoor coal soot pollution and the need for remediation at the source.⁵

⁵ It is reasonable to identify the PRGS as the source of settled coal soot in the surrounding communities. AERO Engineering’s analysis of particulate matter dispersion from the PRGS shows that the deposition rate decreases by approximately 93% from the maximum point of particulate deposition (within 100 meters from the PRGS) to a point approximately one kilometer from the PRGS. There are no other coal combustion facilities in the proximity of these communities that would cause the identified settled coal soot.