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MIRANT

June 20, 2007

Dear Dr. Cibulas and Ms. Werner:

Thank you for sharing with us your Stakeholder Letter of June 8, 2007, Ms. Gable's *Exposure Investigation: Airborne Exposures to Sulfur Dioxide, Particulate Matter, and Selected Metals*, dated April 2007 (EI Protocol), and Ms. Gable's and Mr. Dayton's *Exposure Investigation: Monitoring and Health and Safety Plan*, dated April 2007 (EI Protocol H&SP).

Unfortunately, we have found many problems with both ATSDR's overall approach and its EI Protocol. In particular, ATSDR's approach:

- ignores existing and abundant data, and so proposes to fill "data gaps" that do not exist;

- seeks to measure many metals in air near the Potomac River Generating Station (PRGS) — but, remarkably, not in any "control" locations — that (i) derive from numerous sources and are not markers for PRGS emissions; (ii) have already been shown, by very conservative air quality modeling, performed on behalf of the City of Alexandria, to have insignificant impacts even at maximally-affected locations near the PRGS; and (iii) in two instances, cannot even be quantified by the methods proposed in the EI Protocol;

- will not measure three pollutants — HCl, HF, and NO_2 — about which the City, based on conservative air quality modeling, expressed concern;

- will measure $PM_{2.5}$ using a method that cannot provide data suitable for comparison with U.S. EPA's NAAQS; and

- will measure SO_2 by a method that will not provide complete information.

For these and other reasons, detailed below, we doubt that ATSDR's study, unless substantially modified, will allow a determination of how, if at all, emissions from the PRGS affect public health.

Allow us please to elaborate, as follows.

STAKEHOLDER LETTER, JUNE 8, 2007

In the first paragraph, penultimate sentence, reference is made to "ATSDR's air modeling." Nothing in the EI Protocol pertains to air modeling. If there is a separate protocol for such modeling, please provide it to us and others. If instead this reference is incorrect (perhaps the phrase should have been "air *monitoring*"?), please clarify.

Also in the first paragraph, last sentence, you write, "The data will not be used to generate regulatory or enforcement-related data." Since your data will be made public, we do not understand how you could make such a guarantee. If you mean instead that ATSDR has no regulatory or enforcement authority, please clarify.

In the second paragraph, you write that "The geographic locations of monitors and schedule of monitoring events have been removed from the enclosed protocol to ensure participant privacy. . . . ATSDR is concerned about . . . tampering with monitoring devices . . . " We are perplexed by the choice to redact the locations from the Protocol, since ATSDR has previously published maps, resolved at street-level, of air monitors that it has deployed *at people's homes*, and has even indicated which of the residential locations included sampling indoors, as well as outdoors.[1] Moreover, we too are concerned about "tampering with monitoring devices," since, as you must know, some of our neighbors, as well as City staff themselves, have pledged to shut down our facility. We believe that the best way to ensure high-quality data is instead to make the monitor locations publicly known.

EI PROTOCOL: MAJOR COMMENTS

1. On the title page, the date is given as April 2007. However, it is our understanding that external peer-review of the draft EI Protocol was not complete until May 2007. Did the external peer review result in no changes to the draft Protocol? Please clarify.

2. On page 2, the purpose of the EI is said to be "to obtain representative concentrations data . . . " but on page 20, it is stated that the data are expected to be "worst case." How can data be at once both representative *and* worst-case? Please clarify.

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[1] See, for example, Inserra S, Phifer B, Pierson R, and Campagna D. Community-based exposure estimate for hydrogen sulfide. *J Expo Anal Environ Epidemiol.* 2002 Mar;12(2):124-9.

3. On page 2, the topic sentence in the "Sulfur Dioxide" section reads, "The primary objective of the Exposure Investigation is to determine if community exposures to SO_2 are occurring in areas near the Mirant facility." If this is indeed the primary EI objective, the EI hardly seems needed. First, it is common knowledge that SO_2 has been emitted from the Potomac River Generating Station (PRGS) since the 1950's, and that these emissions have been regulated and monitored for decades.

   Second, SO_2 has been a NAAQS-regulated pollutant since 1971: hourly ambient air concentrations of SO_2 are measured at the criteria pollutant monitor in Alexandria (located at 517 N. Saint Asaph St., about 3/4 of a mile from the PRGS). Indeed, an SO_2 monitor has been located at this site *since 1969*. Annual summary data since 1972 for ambient SO_2 at the Alexandria site are readily available (at http://www.epa.gov/aqspubl1/annual_summary.html); *hourly* SO_2 *data since 1995* are also available (at http://www.epa.gov/ttn/airs/airsaqs/detaildata/downloadaqsdata.htm).

   Third, under a consent order with U.S. EPA, in the summer of 2006, Mirant installed six ambient air SO_2 monitors, *specifically located* to capture expected maximal impacts from the plant's exhaust stacks to people who live and/or recreate in the immediate area. These hourly SO_2 data are regularly submitted to EPA, the Virginia DEQ, and the City of Alexandria. Mirant also installed $PM_{2.5}$ monitors at the two locations where high impacts were predicted. Since mid-April 2007, Mirant has been collecting 5-minute SO_2 data at all of these sties, and has offered to share these data with ATSDR in a collaborative manner if an acceptable protocol were to be agreed upon.

   Fourth, since mid-March 2007, the City of Alexandria has also conducted PRGS-targeted ambient monitoring for SO_2, and thus has several months' worth of data, resolved at the level of 5-minute averages.

   The EI Protocol fails to mention or analyze any of these informative sets of sulfur dioxide data. Since all reliable studies begin with an analysis of existing relevant data, and only thereafter determine whether significant gaps in data remain, this is a major omission.

   Finally, since none of our tens of thousands of targeted 5-minute SO_2 ambient air measurements reaches U.S. EPA's draft, health-based, guideline level of concern, we do not believe, based on the evidence, that SO_2 exposures near the PRGS harm public health.

4. On page 2, mention is made of sampling *indoor* air for SO_2. In general, indoor air concentrations of SO_2 are known to reflect outdoor concentrations (regardless of whether windows are open or closed, and regardless of whether air conditioners are in use), but, since cigarette smoke, candles, lighted matches, and incompletely ventilated appliances are indoor sources, if ATSDR wishes to sample indoor air, it must do so with care to exclude these and other confounding sources (such as air intakes being influenced by idling of diesel-powered vehicles). The Protocol

makes no mention of how ATSDR will recognize and account for these confounders.

5. On page 3, it is stated that "only limited concentration data is available for metals and particulates in the investigation area." Again, this does not accurately describe the data. Being home to a major waste-to-energy combustion facility, a sizable hot-mix asphalt plant, other industrial facilities, numerous large-scale construction projects, and a 164-acre Superfund site (the Army Cameron Station), the City of Alexandria has had a long-standing interest in, and program for, monitoring ambient air quality and addressing issues of metals and other hazardous substances. Data on particulate matter (PM) and metals are indeed available from the City, and, as mentioned above, PM data specifically targeted at PRGS are also available. EPA's National Air Toxics Assessment (NATA) also provides modeled estimates *at the census tract level* for airborne concentrations of metals and more than 100 other chemicals (including HCl and HF, about which the City expressed concern) designated as Hazardous Air Pollutants (most recently for the 1999 calendar year (http://www.epa.gov/ttn/atw/nata1999/). Yet the Protocol makes no mention of these estimates. It does the reader a disservice to imply that this is uncharted territory.

6. More importantly, also on page 3, the Protocol is silent on its rationale both for *including* "metals and particulates" among the pollutants to be measured, and for *excluding* several of the pollutants of concern to the City and, presumably, its Health Department that requested this EI. Examining Table 1 on page 10 of the Protocol, one finds that virtually every pollutant for which ATSDR proposes to monitor is either (i) already being monitored for, or (ii) has already been predicted, by conservative, worst-case modeling, to be of no health consequence. More remarkably, several of the air pollutants that the City apparently *is* concerned about — and which no one, to our knowledge, is measuring in the immediate area of the PRGS — are *not* proposed for measurement by ATSDR.

   In particular, using very conservative[2] air quality modeling of the PRGS's emissions (combined with assumed background values), on behalf of the City, Maureen Barrett, P.E. (August 2005, available at http://alexandriava.gov/tes/DEQ/pdfs/aero_report.pdf) predicted (though, lacking relevant ambient measurements, could not verify) unacceptable concentrations of six pollutants. Three of these (NO_2, HCl, and HF) the Protocol ignores entirely; the other three ($PM_{2.5}$, PM_{10}, and SO_2) the Protocol proposes to measure using

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[2] In this context, "conservative" means "likely to over-predict airborne concentrations." We can assess the extent of over-prediction by comparing Ms. Barrett's *modeled* annual average SO_2 estimate, at the maximally-affected receptor (Northeast fence-line), with the long-term average *measured* SO_2 concentration from samples taken at the monitor deployed at this location for almost every hour, from July 1, 2006 through May 31, 2007. So doing, we find that the modeled long-term impact (1,009 ug/m^3) over-predicts the measured long-term impact (18 ug/m^3) by a factor of 56!

non-standard methods that are not likely to yield completely informative or interpretable data.

Moreover, Ms. Barrett conservatively modeled worst-case impacts from PRGS's presumed emissions of a large number of "toxic air pollutants," including heavy metals and organic products of incomplete combustion (such as formaldehyde and acrolein). *In each case*, she estimated that the maximum ambient air impacts, on both a short-term (1-hour) and long-term (annual) basis, were acceptably small when compared with either Virginia's health-based ambient air quality standards or U.S. EPA's estimates of safe levels (EPA's reference concentrations). Yet, these are the very metals that the Protocol proposes to measure! Given the very conservative nature of Ms. Barrett's modeling, and given the limited duration of proposed ambient air monitoring by ATSDR, it is not credible to imagine that ATSDR will find concentrations of any of these metals or combustion products, attributable to emissions from the PRGS, at levels even close to those predicted by Ms. Barrett as being both worst-case and safe.

Overall, then, it is difficult to determine how the proposed EI would fill significant data gaps or otherwise advance knowledge of air quality surrounding the PRGS.

EI PROTOCOL: ADDITIONAL COMMENTS

7. On page 3, ATSDR writes, "An exposure investigation is NOT a study." What is meant by this? If it's not a study, what IS it? Please clarify.

8. Following from above, we read, "Rather, it is a biased attempt at identifying the individuals most highly exposed and sampling their exposure." The phrase "biased attempt" is peculiar, at best. In what way is it biased to target the most highly exposed members of the public? Isn't that ATSDR's job? Of course, if there is only one such individual (or perhaps only a very few), an argument could be made that effects at the single-individual level do not constitute effects on public health. Also, what does "our results are a public health service . . ." mean? Please clarify.

9. On page 9, ATSDR writes that "Table 1 lists pollutants that will be measured during the EI and associated comparison values, if available." However:

    a. Table 1 lists hexavalent chromium as a pollutant to be measured, but the analytical method specified on page 17 for determination of the concentration of toxic metals (EPA Method IO-3.5, ICP/MS) cannot be used to measure hexavalent chromium; the method can instead measure only total chromium (which, even in urban ambient air, is almost entirely, if not entirely, trivalent). Moreover, ATSDR's own *Toxicological Profile for Chromium* (1994) indicates that only 0.2% of the chromium emitted from coal-fired power plants is in the hexavalent form!

    b. The ATSDR MRL listed in Table 1 for mercury is applicable to elemental mercury exposures. However, the sampling method specified on Page 17

(EPA Method IO-2.1, high volume sampling for total suspended particulate matter), will not collect elemental mercury, which is, of course, a vapor.

10. ATSDR does not describe how it will use the "Comparison Values" listed in Table 1, nor does it provide a rationale for the selection of these values and, importantly, the exclusion of other health-based values. More importantly, Table 1 fails to provide the specific time frames over which data will be averaged, despite the fact that all ambient air guidelines and standards (whether developed by EPA or VDEQ) specify such time frames (such as 1-hour averages, 24-hour averages, etc.). ATSDR's acute MRLs, in contrast, as developed in the Agency's Toxicological Profiles, apparently can apply to data averaged over a period of 1 day up to 14 days, regardless of the specific time frame over which relevant health effects occur. Our discussions with ATSDR, however, indicated that, for SO2, in particular, 10-minute or 5-minute ambient data are to be sought. If so, the Protocol should specify this. In fact, valid peer review of this Table cannot be accomplished without such specification and explanation for each pollutant.

    More generally, Table 1 fails to provide, for the peer reviewer or general reader, many of the other (and very different) health-based values for these various chemicals and mixtures. This is an especially significant omission, both because of the large ranges and the vanishingly small concentrations listed for some of the pollutants. The ATSDR acute MRL (which applies to exposures of up to 14 days) and the EPA 24-hour NAAQS for SO_2 (which, by definition, is designed to protect the public, including sensitive populations, with an adequate margin of safety) should be applicable to the same 24-hour-averaged data, but these values differ by a factor of 14! Similarly, the ATSDR CREG and the California chronic REL for arsenic differ by a factor of 150. Moreover, the ATSDR CREGs for arsenic, cadmium, and hexavalent chromium are smaller than the concentrations reported in the respective ATSDR *Toxicological Profiles* as being typically present in remote and background measurements! Clarification is needed to describe how ambient air concentrations that might be comparable to remote, non-industrialized, non-densely populated background levels, yet "exceed" the CREGs, will be evaluated with respect to potential health implications for a densely developed city such as Alexandria. In addition, full references should be given for each of the sources listed.

11. The method ATSDR has chosen for $PM_{2.5}$ monitoring (the use of a Met One beta attenuation monitor) will provide data on the hourly trends in $PM_{2.5}$ levels, but the ambient air standards are based on 24-hour and annual averages. More importantly, because the chosen method is not a Federal Reference or Equivalent Method, the data it provides should not be used for comparisons with the EPA's $PM_{2.5}$ NAAQSs (despite ATSDR's listing these NAAQS as "comparison values" in Table 1). The Protocol should explain why this beta attenuation method was chosen, its advantages and disadvantages, and the Agency's proposed use, for purposes of public health assessment, of the data that the chosen method will provide.

12. The use of a TSP (total suspended particles) high-volume sampler, as described on page 17, is inappropriate for the evaluation of exposures to atmospheric metals emitted by the Mirant PRGS. For the investigation of such emissions, the use of a PM_{10} sampler would provide more meaningful results. The TSP samples that ATSDR will collect will contain (and may well be dominated by) particulate matter that is too large to be inhalable, and is therefore of less interest from a toxicological perspective. The coarse particulate matter in the TSP samples will also contain material that is present due to emissions from fugitive sources such as windblown crustal material and resuspended roadway dust, yet the Protocol proposes no "control sites" that would allow evaluation of these confounders. Moreover, high-volume samplers are quite noisy, but the Protocol makes no mention of having informed residents of this issue.

13. On p. 16, ATSDR describes a pre-monitoring survey that will be used to configure the SO_2 monitoring equipment for measurements between either of two ranges: 5 to 200 ppbv, or 200 to 6,000 ppbv. This is another indication that ATSDR has chosen an inappropriate method. Had the Agency reviewed even the abundant hourly data to date, it would have been apparent that, although short-term SO_2 concentrations in the targeted study area are almost always below 200 ppbv, on occasion they exceed this level. Therefore, ATSDR should use the standard EPA analytical method that easily spans the relevant range (1 ppb to 1,000 ppb), rather than cutting off either the typical low values or the occasional high values.

14. The demographic data provided on page 8 are inadequate. First, the Protocol implies that the "approximately [sic] 133,479 people" who live in Alexandria are a "target population." No basis for this "definition" of target population is provided, and, given (i) the extreme easterly location of the PRGS, (ii) prevailing winds, and (iii) the geography of Alexandria, the entire city is not in fact a "target."

    Second, the Protocol refers to "Appendix B" as the source of its demographic data, but the data provided in Appendix B do not match the data provided on page 8.

    Third, the Protocol fails to mention the high population density of Alexandria, which can influence both air quality and public health.

    Fourth, the Protocol states that it provides the "percentage of population" of each race/ethnicity, but it does not.

    Fifth, a "boiler plate" description of "special populations" is given, with no pollutant-specific rationale. Moreover, the genuinely sensitive population for the primary pollutant of interest — the subset of SO_2-sensitive asthmatics who live or recreate close to the PRGS — goes completely unmentioned and un-enumerated! The Virginia Department of Health goes to great lengths to track and enumerate Virginians with asthma: these data are readily available for all counties and major

cities, including the City of Alexandria (http://www.vahealth.org/cdpc/asthma/documents/PDF_2007/Comprehensive%20Asthma%20Data%20Report_Internetversion01.pdf.pdf) and should be provided in the Protocol.

Sixth, the fact that "biological sampling will not be conducted" is not, by definition, an "exclusion criterion."

Overall, then, it seems to us that ATSDR would have benefited from our, the City's, and the VA Department of Health's technical review of this Protocol before it was finalized. Although we asked repeatedly for such an opportunity, it was not provided.

I trust that you will find these comments helpful..

Sincerely yours,

Robert Driscoll
Chief Executive Officer
Mirant Mid-Atlantic

cc: Lora Werner
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