



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 7 2009

OFFICE OF
AIR AND RADIATION

The Honorable Bill White
Mayor of Houston
Office of the Mayor
901 Bagby, 3rd Floor
Post Office Box 1562
Houston, Texas 77251-1562

Dear Mayor White:

Thank you for your letter of July 9, 2008, filing a Request for Correction (RFC 08003) under the Environmental Protection Agency's Information Quality Guidelines (EPA IQG).¹ In that letter and your subsequent letter dated January 22, 2009, you cite concerns about the objectivity and utility of the emission factors pertaining to refineries and chemical plants. You request that EPA: (1) immediately establish firm deadlines to revise the emission factors subject to your petition, based upon reliable, accurate and unbiased data from direct observation and other accurate measurements, in order to create valid emission inventories; (2) require the use annually by large refineries and chemical manufacturing plants of cost-effective remote sensing technologies and installation of fence-line monitoring to verify emissions; and (3) require refineries and chemical plants undergoing modification to document emissions reductions through the use of direct measurement if they wish to avoid installing pollution control equipment required under the Clean Air Act. We share your concerns about the accuracy of emissions estimates and hope to work with you and other stakeholders to improve emission inventories at refineries and chemical plants.

As you are aware and as outlined in your request, we have a number of initiatives designed to advance the use of remote sensing technologies (including fence-line monitoring) and better characterize emissions from petroleum refineries and chemical plants. In addition, as a direct result of the concerns outlined in your request, we are planning to undertake a number of additional initiatives.

Ongoing and Planned Initiatives

- 1) A grant was awarded in July 2008 to the City of Houston for measurement and analysis of

¹ Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency, EPA, 2002 (67 FR 63657).
http://www.epa.gov/quality/informationguidelines/documents/EPA_InfoQualityGuidelines.pdf

volatile organic compound (VOC) and air toxics emissions in the Houston Ship Channel area using DIAL (Differential Absorption LIDAR (Light Detection and Ranging)) technology. This grant demonstrates EPA's support for additional data which Houston area stakeholders can consider in making decisions to achieve improved local air quality. Additionally, the data collected will help our understanding of these emissions nationwide. We look forward to working with you in this effort to prioritize sources for assessment, to ensure the sources are well characterized during the assessment, and to understand the results of the effort. Finally, upon completion of this study (estimated to be in 2010), we will evaluate how best to incorporate these results into future projects and ultimately into future emission estimation guidance.

- 2) Prior to receipt of your Request for Correction, we had begun the development of a protocol handbook (with detailed examples and case studies of previous projects) that would include all essential aspects of undertaking a project using remote-sensing technologies for emissions measurements including data quality objectives, quality assurance plans, validation/verification, and data interpretation. Your request confirms the importance of developing this type of handbook and we are committed to issuing a draft by the end of 2010. Further information on this initiative can be obtained by contacting Dennis Mikel at (919) 541-5511.
- 3) Subsequent to the completion of the DIAL remote sensing study that was conducted at the BP Amoco facility in Texas City, Texas, we began evaluating the emission estimates from the test data that was collected during that study. In addition, we will also evaluate data from any future remote sensing studies. We believe these data are the appropriate data to review as we improve emissions estimation methods rather than examining past remote sensing data studies conducted at foreign petroleum refineries, where the refining practices may or may not reflect the practices of domestic refineries and the emission sources were not well characterized. We intend to provide a draft analysis of the BP Amoco data to the public for review within the next 6 months. We plan to accomplish this by following the same established procedures that we follow for soliciting public comments on draft emissions factors. Specifically, we will post the draft analysis to our emissions factors web site (<http://www.epa.gov/ttn/chief/efpac/abefpac.html>) and notify individuals of the opportunity to comment through our CHIEF Listserv service. Further information on this initiative can be obtained by contacting Brenda Shine at (919) 541-3608.
- 4) In direct response to your requests, in January 2009, we began the development of a comprehensive protocol for the estimation of VOC and air toxics emissions from petroleum refineries and chemical plants. This protocol will address all emissions sources and will include startup, shutdown, and malfunction events. In developing the protocol, we will review existing emission factors, including, but not limited to tanks, flares, and cooling towers, and to refine or revise the emission factors as necessary. We plan to make a draft of this protocol available for public review by following the same established procedures that were explained in item number 3 above. In the future, we plan to use data derived from this protocol to: a) evaluate risks to exposed populations; b) conduct comparisons to existing emissions estimates (e.g., TRI) for specific facilities; and c) better characterize the cost effectiveness of controls. In addition, we will develop additional factors and methodologies

for additional emission sources including delayed cokers. This protocol will improve the consistency, transparency and accuracy of future emission estimates for these facilities. Further information on this initiative can be obtained by contacting Brenda Shine at (919) 541-3608.

- 5) As part of our corrective action strategy to the 2006 EPA Office of Inspector General Report,² we have already developed tools such as the Electronic Reporting Tool (ERT) to assist in improving the quality of our emissions factors. In addition, we will continue our efforts to develop a self-sustaining emissions factors program that produces high quality emission factors, quantifies the uncertainty of emissions factors, ensures the appropriate use of emissions factors, considers stakeholder input appropriately, and improves emissions quantification through the use of better tools and knowledge of uncertainty. More information on the ERT can be obtained by visiting http://www.epa.gov/ttn/chief/ert/ert_tool.html, and more information on our efforts to redesign our emissions factor program can be obtained by contacting Bob Schell at (919) 541-4116.

Background

I believe our rationale for undertaking the initiatives outlined above is best explained by first providing some background information on the purpose and intended use of AP-42 emissions factors. These factors are designed to be representative values relating the quantity of a pollutant released to the atmosphere under normal operating conditions with an activity associated with the release of that pollutant. By their nature, these factors are indicative of situations that have broad applicability and, as such, were originally intended as a tool for use in developing national, regional, state, and local emissions inventories. The idea of developing emission factors to account for site-specific conditions such as upsets, start-ups and shutdowns is counter to the definition of an emissions factor. We do not believe that updating emissions factors to account for such site-specific events is the solution for improving emissions estimates at refineries and chemical plants. We believe the issue is larger than just the quality and coverage of specific emission factors and speaks to the need for a comprehensive protocol for developing emission inventories. The protocol will combine emissions factors (to account for emissions during periods of normal routine operations) with other engineering calculations (to account for emissions during non-routine conditions) to allow for the estimation of facility-wide emissions during any stages of operation at a facility. Ultimately, we believe the lack of such a protocol can lead to omission of emission sources, improper characterization of process data and subsequent emissions data, and inconsistent reporting from one facility to the next.

To illustrate our point, consider some of the more common emission sources at petrochemical and petroleum refining facilities, such as storage tanks and flares. While AP-42 emission estimation equations exist for calculating working and standing losses from tanks, the estimates resulting from these equations depend on whether the user has accurately characterized the material stored in the tanks, the conditions of the fittings and seals, and the ambient conditions surrounding the tanks. If these site-specific conditions are not properly characterized,

² EPA Can Improve Emissions Factors Development and Management, U.S. EPA Office of Inspector General, Report No. 2006-P-00017, March 22, 2006. <http://www.epa.gov/oig/reports/2006/20060322-2006-P-00017.pdf>

the resulting emissions estimates will not be representative. Further, if short term inputs resulting in short-term emission rates are then extrapolated to long term or annual emissions without consideration of variability in operations or other conditions, resulting long term emissions will not be representative. Even if we undertake a study to improve the emissions equations, the inputs to these equations will always be site specific and will always affect the quality and accuracy of the emissions estimates. Similarly, a VOC destruction efficiency of 98 percent is often used for flares. While this efficiency may not be achieved in practice under all conditions (and this is an area where newer, state-of-the-art measurement techniques can inform this debate), other factors, such as flow and concentration and variability over time, are just as important to the emission estimate for a flare. Developing better flare emission factors will not address these site-specific variables that are crucial to the overall estimates.

Therefore, in addition to improving specific emission factors for selected processes (e.g., emissions from delayed cokers), we believe that a more comprehensive approach to addressing how facility-wide emissions estimates are conducted is needed to improve the overall accuracy of future emission estimates. This approach, or protocol, would provide a consistent method for selecting and applying emission factors, where available and appropriate, but also would provide guidance on the use of other emission estimation methodologies that do not rely on emission factors. It would address, among other things, minimum data quality objectives for process inputs, coverage of emissions sources, calculation of non-routine events such as startups, shutdowns and malfunctions, and inclusion of other information that would inform the estimates such as temporal variability in processing operations.

We are committed to developing such a protocol for petroleum refineries and petrochemical plants. As part of this effort, we would also review specific emission factors and initiate work to refine, revise and develop additional factors and methodologies for emission sources, including but not limited to tanks, flares, delayed cokers, and cooling towers. This effort could include the use of optical remote sensing techniques to quantify emission sources as well as startup, shutdown, and malfunction events that have been difficult to quantify. It will also include a critical review of available remote sensing data, conclusions drawn from the assessment, and an assessment/prioritization of sources for further study. Finally, we will also attempt to validate any protocol with actual measurement data. We plan to work with you and other stakeholders to undertake this project.

Finally, as noted in item number 5 above, we have embarked upon an effort to redesign our current emissions factor program for both criteria and air toxics pollutants to (1) make the development of emissions factors more self supporting and open to fuller participation by external organizations; (2) increase the use of electronic means to standardize the development process, quantify the quality components, and streamline all aspects of emissions factors development and use; (3) make the emissions factors uncertainties and emissions quantification methodologies more transparent to users; and (4) provide direction on the proper application of emissions factors consistent with non-inventory program goals including clearer guidance and direction on use of more direct quantification tools (e.g., emissions monitoring) in lieu of emissions factors. We believe this effort will provide the foundation that will result in high quality emissions factors based on a significant amount of data for many industrial sectors, including the petroleum refining and chemical industry sectors.

We believe that the efforts we have initiated, especially the development of an emissions protocol document, will allow for more accurate estimation of emissions from these types of facilities. Although we have not provided firm deadlines for revising the emission factors for petroleum refineries and chemical plants, this letter provides a status update and a timeline for the completion of key tasks for each initiative. With respect to your request to require large refineries and chemical manufacturing plants to change their current procedures, federal agencies can not add additional requirements without a formal rulemaking. Before considering this option, EPA would like to evaluate the data from the initiatives outlined in this letter to determine the most effective way to enhance the estimation of emissions from large refineries and chemical manufacturing plants. In closing, we look forward to working with you to further address this important issue, including establishing milestones and priorities for the development of solutions to these important emissions estimation issues.

If you are dissatisfied with this response, you may submit a Request for Reconsideration (RFR). The EPA requests that any such RFR be submitted within 90 days of the date of EPA's response. If you choose to submit a RFR, please send a written request to the EPA Information Quality Guidelines Processing Staff via mail (Information Quality Guidelines Processing Staff, Mail Code 2811R, U.S. EPA, 1200 Pennsylvania Avenue, NW, Washington, DC 20460); electronic mail (quality@epa.gov); or fax [(202) 565-2441]. If you submit a RFR, please reference the request number assigned to the original Request for Correction (RFC #08003). Additional information about how to submit an RFR is listed on the EPA Information Quality Guidelines website at <http://www.epa.gov/quality/informationguidelines/>.

Again, thank you for your letter. If you have additional questions, or require further information on the IQG process, please contact Reggie Cheatham at (202) 564-7713.

Sincerely,

A handwritten signature in black ink, appearing to read "Barbara Johnson for", written over the printed name "Elizabeth Craig".

Elizabeth Craig
Acting Assistant Administrator