

Peer Review Summary Document

(5/13/2014)

Peer Review Plan

http://www.usgs.gov/peer_review/docs/pah_concentration_ban_on_coal-tar-sealants_austin-tx_050814.pdf [18.1 KB PDF]

Title and Authorship of Information Product Disseminated

PAH Concentrations in Lake Sediment Decline Following 2006 Ban on Coal-Tar-Based Pavement Sealants in Austin, Texas, by Peter C. Van Metre and Barbara J. Mahler.

Peer Reviewers' Expertise and Credentials

Reviewer #1: Is a USGS research hydrologist with a bachelor's degree in Physics and a master's degree in Civil and Environmental Engineering. The reviewer's USGS research has focused primarily on water-quality investigations of surface water with emphasis on nonpoint source pollution, including the study of many different contaminants for determination of occurrence, variability, influence on toxicity to aquatic organisms, and evaluation of the effectiveness of watershed management actions. The primary contaminants the reviewer studied include organic and inorganic aircraft deicers, PAHs, metals, nutrients, and microorganisms.

Reviewers #2-5: Are four anonymous peer reviewers chosen by the scientific journal *Environmental Science and Technology (ES&T)*. The *ES&T* editor who handled this paper is Dr. Ronald Hites, an internationally known expert in environmental organic chemistry. Dr. Hites selected Reviewers #2-5, evaluated those reviews, and had ultimate responsibility to accept or reject the manuscript. The reviewers were selected on the basis of the subject matter of the paper, the experts available in a given area, and knowledge of the habits of proposed reviewers (*Environ. Sci. Technol.*, vol. 23, no. 1, 1989, p. 30).

Charge Submitted to Peer Reviewers

The reviewers were asked to make an objective evaluation of the research, with particular emphasis on the interpretation and discussion of results. They were notified that the subject matter could receive attention on a nationwide scale and be scrutinized at a high level of detail.

Summary of Peer Reviewers Comments

Reviewer #1: The reviewer found that the manuscript represented "advancements in understanding of the impact of coal-tar-based sealants on urban stream sediment" and that it was "well written and well organized. The reviewer had several relatively minor comments which the authors addressed.

Peer Reviewer #2: The reviewer felt that the initial data set, which consisted of two sediment cores collected in 2012 from one location in one lake, was too limited to justify the conclusions. Disturbance of one of the cores by a large flood event added to the uncertainty. The USGS authors response was that Lady Bird Lake is the only lake where the efficacy of a

ban can be tested at this time because Austin was the first city to institute a ban (in 2006) and because it takes years for streams and lakes to respond to such an action. On resubmittal of the revised manuscript, this reviewer still felt that a larger data set would have made for a stronger paper, but agreed that it was publishable work. However, because Reviewer #5 (see below) also expressed a concern regarding the size of the data set during this round of review, the USGS authors collected an additional core and surficial bed-sediment samples in February 2014. Those data confirmed the downward trends in PAHs since the ban indicated by the 2012 cores, satisfying both reviewers' concerns.

Peer Reviewer #3: The reviewer found the initial manuscript to be a well-written work and remarked that the authors provided solid evidence of a decline of PAH concentrations after the ban. The reviewer further commented that the manuscript merits publication in ES&T. The reviewer made several technical and editorial suggestions that the authors addressed. On reviewing the revised manuscript, the reviewer remained positive about the merit of the manuscript, noting that their earlier comments had been addressed and stating that the inclusion of contaminant mass balance modeling was a significant improvement.

Peer Reviewer #4: The reviewer stated: "The scientific arguments are logical and thoughtful. The authors do a great job of staying within the realm of reasonable interpretation." Additional minor comments and suggestions from Reviewer #4 were addressed by the authors.

Peer Reviewer #5: The reviewer received the first revision of the manuscript following initial comments by Reviewers # 1-4. Reviewer #5 made comments similar to those expressed by Reviewer #2 regarding the size of the data set, and also commented on the uncertainty regarding age-dating of the 2012 cores and the effects of the 2007 flood on the integrity of one of the cores. In response, the authors revised the manuscript to include additional data obtained from a core and surficial bed-sediment samples (5 locations total) collected in 2014 that verified the findings from the two cores collected in 2012. The 2014 core showed downward trends in PAH concentrations similar to those observed in the 2012 cores, and the bed-sediment samples added a spatial component by comparing surface-sediment concentrations in 2014 with concentrations measured in 2000 and 2001 at four additional locations in the lake.

Summary of USGS Response to Peer Reviewer Comments

Virtually all editorial comments and revisions suggested by the reviewers were incorporated into the revised manuscript, which strengthened the overall clarity. Reviewer #2 provided numerous useful comments that improved the manuscript. Most importantly, Reviewer #2's concern that the results were based on a relatively limited data set (2012 cores) led the authors to conduct a second sampling campaign in 2014. In response to comments by Reviewer #2 regarding the reasoning for sampling only one lake, information on the characteristics of Lady Bird Lake (population, portion of area and of population affected by the coal-tar-sealant ban) was added. As suggested by Reviewer #3, additional information on laboratory quality control and handling of non-detections was added and quantitative PAH source apportionment using the CMB model was included (this also was suggested by Reviewer #1). Responses to specific comments by Reviewer #4 were mostly editorial, for example, the authors clarified discussion of an earlier paper that attempted to detect trends in PAHs following the sealcoat ban in Austin. Reviewer #5 made a number of substantial and helpful suggestions that resulted in several additions, including suggestions to: 1) include the organic carbon content of samples and carbon-normalized PAH concentration trends (figure S-2) in the supporting information; 2) resample surface sediment samples at four locations in the lake that had also been sampled prior to the ban (in 2000 and 2001);

and 3) collect an additional long gravity core, which corroborated results from cores collected in 1998 and 2012.

The Dissemination

The product will be published as an article in *Environmental Science and Technology* and will be available at <http://pubs.acs.org/journal/esthag>.