October 26, 2016 **VIA EMAIL ONLY**

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SUBJECT: EXTERNAL PEER REVIEW OF THE TEST PROCEDURE FOR DETERMINING ANNUAL FLASH EMMISSION RATE OF METHANE FROM CRUDE OIL, CONDENSATE, AND PRODUCED WATER TANK AND SEPARATOR SYSTEMS

Dear Professor Devegowda,

My letter today is intended to initiate the external review.

The California Air Resources Board (ARB) will receive reviewers' comments and curriculum vitae from me after the review has concluded, and not be a party to the process.

Documents for review are being provided through a secure FTP site. Sections I and II below give instructions for accessing the FTP site and list the documents on the site.

You can access this site through the one month period of review. The URL, username and password are as follows:

I. https://ftp.waterboards.ca.gov/

Username: PRFTP
Password: Waterpr

II. List of Documents at FTP site:

A. August 10, 2016 memorandum signed by Elizabeth Scheehle, Chief: "**Request for External Peer Review of the Test Procedure for Determining Annual Flash Emission Rate of Methane from Crude Oil, Condensate, and Produced Water Tank and Separator Systems**."

Attachment 1: Plain English Summary of the Test Procedure

Attachment 2: Description of Scientific Bases of the Test Procedure to be Addressed by Peer Reviews

The conclusions listed in Attachment 2 are the focus for the review. As expertise allows, comment on conclusions in the order listed.

Attachment 3: List of Participants Associated with the Development of the Test Procedure

Attachment 4: List of References for the Test Procedure:

Initial Statement of Reasons (ISOR) for the Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

Proposed Oil & Gas Regulation (Appendix A of the ISOR)

Test Procedure (Appendix C of the Proposed Oil & Gas Regulation) - it is this Appendix C, the Test Procedure, that is to be reviewed, not Appendix C of the ISOR, which is the Draft Environmental Analysis.

NOTE: Any downloaded or hard copies of the following ASTM or GPA test methods are to be deleted or destroyed immediately following this review.

ASTM D-70-09
Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method)

ASTM D-287-92
Standard Test Method for API Gravity of Crude Petroleum Products (Hydrometer Method)

ASTM D-1945-03
Standard Test Method for Analysis of Natural Gas by Gas Chromatography

ASTM D-2597-10
Standard Test Method for Analysis of Demethanized Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography

ASTM D-3710-95
Standard Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography

ASTM D-3588-98
Standard Practice for Calculating Heat Value, Compressibility Factor; and Relative Density of Gaseous Fuels

ASTM D-4007-08
Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method

ASTM D-4052-09
Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

ASTM D-5002-16
Standard Test Method for Density and Relative Density of Crude Oils by Digital Density Analyzer

EPA METHOD 8021B
Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors

EPA METHOD 8260B
Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

EPA METHOD TO-14
Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Specially Prepared Canisters with Subsequent Analysis By Gas Chromatography

EPA METHOD TO-15
Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/ Mass Spectrometry (GC/MS)

GPA 2174-93
Analysis Obtaining Liquid Hydrocarbon Samples for Analysis by Gas Chromatography

GPA 2177-03
Analysis of Natural Gas Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography

GPA 2261-00
Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography

GPA 2286-95
Method for the Extended Analysis of Natural Gas and Similar Gaseous Mixtures by Temperature Program Gas Chromatography

B. **January 7, 2009 Supplement to the CalEPA Peer Review Guidelines.** This Supplement provides guidance to ensure the review is kept confidential through its course. The Supplement notes reviewers are under no obligation to discuss their comments with third-parties after reviews have been submitted. We recommend they do not. All outside parties are provided opportunities to address a proposed regulatory action through a well-defined regulatory process. Please direct third parties to me.

Please send your review to me on November 23, 2016.

Questions about the review should be for clarification, in writing – email is fine, and addressed to me. My responses will be in writing also. I subsequently will forward all reviews together to Elizabeth Scheehle with reviewers' Curriculum Vitae. These will be posted at the Air Resources Board program website for this proposal.

Your acceptance of this review assignment is most appreciated.

Sincerely,

Gerald W. Bowes

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