

Draft Outline for Multimedia Guidance Document with
Recommendations on the Types of Scientific Information to be submitted by Applicants
for California's Fuels Environmental Multimedia Evaluations

I. Executive Summary

- A. Results of Integration of all media analyses (air, water, soil, etc.)
- B. Conclusions of the Multimedia Risk Assessment
- C. Recommendations

II. Philosophy of Multi Media Guidance Document

- A. Flexibility to address factors unique to each fuel type
- B. Consultation and review
- C. The tiered approach
 - 1. Tier 1: Technical peer review consultation to establish the risk assessment element
 - 2. Tier 2: The experimental design for future work is developed and reviewed
 - 3. Tier 3: Final product is produced and used as the basis for the recommendations that go to the Environmental Policy Council

III. California Regulatory Review Process

- A. Preliminary review of proposed multimedia approach by the CalEPA Multimedia Interagency Working Group
- B. Multimedia Risk Assessment Design Review
- C. Final Multimedia Risk Assessment Submittal

IV. First Tier: Preliminary Review Elements

- A. Summary of regulatory approvals
 - 1. This should include any individual state or national regulatory approvals that are available or in progress and any government-adopted health criteria.
 - 2. Should international approvals/protocols be consulted?
- B. Background fuel information

1. Fuel and fuel modifications
2. Chemical composition
3. Summary of manufacture, transportation and storage of the fuel and additive components
4. Historical use of fuel components or additives

C. Establish Information Necessary for Risk Assessment Design

1. Technical peer review consultation to establish the risk assessment elements needed for the proposed fuel
 - a. The applicant brings to the Multimedia Working Group a summary of what is known based on their experience and expertise. Including:
 - Physical, and chemical and environmental toxicity characteristics of the reference fuel, candidate fuel and additive components
 - Summary of all potential distribution, and use release scenarios including a discussion of the most likely release scenarios
 - b. Release Scenarios - The list of defined release scenarios should consider:
 - Summary of the expected environmental behavior (transport and fate) of proposed fuel or fuel components that may be released
 - Example Release Scenarios
 - Comparison of physical, chemical, and toxic properties of the fuel or additive components to appropriate agreed upon control fuel or fuel components.
 - Each piece of data that needs to be provided to answer a specific question.
 - c. The applicant then proposes and justifies to the working group a set of key elements that will be used as a basis for the multimedia risk assessment.
 - d. The working group agrees to or amends this list of key elements.

V. Second Tier: Risk Assessment Design Review Elements

The experimental design for future work is developed and reviewed by the multimedia working group. This experimental design is also peer reviewed.

A. Experimental Design

1. Scope and data set recommendations
 - a. The Risk Assessment design should be a comparison between the proposed fuel and additive and the appropriate CARB fuel
2. How will knowledge gaps be addressed?

- a. Role and Use of models
 - b. Surrogate chemicals
3. How to address areas of important health/environmental impacts where experimental tools are not well defined
 4. Methodology of Integrating of all media analyses (air, water, soil, etc.)
 5. Identification of fate and transport conceptual models for releases of the modified fuel into both surface and subsurface waters.
 - a. Consideration should be given to fuel transport as a non-aqueous phase liquid and as a vapor phase. In the subsurface, this should include consideration of the processes that occur under saturated and unsaturated groundwater conditions and should consider the interaction of the fuel with the soil matrix.
 - b. Fate and transport conceptual model questions that should be addressed include:
 - Will there be any changes in tailpipe emissions that could affect water quality (i.e., through washout)?
 - What are the effects on capillary and soil pore conditions and partitioning within the soil environment?
 - What are the effects on the fate and transport of surface and groundwater plumes – Once it reaches water, will a modified fuel plume move faster or farther or be more persistent than, for example, ultra-low sulfur diesel?
 - Will there be any relative change in biodegradation rates?
 - What will be the ultimate fate of the product by component as compared to existing fuel specifications or for the new components in the modified fuel that are not already in existing fuels (mass balance)?
 - Will daughter products be produced during natural environmental transformation processes and what is the hazard associated with these daughter products?
 - What will be the impact if a release commingles with existing soil/groundwater contaminated with petroleum hydrocarbons or fuel additives such as MTBE or TBA? Specifically, will the modified fuel mobilize petroleum contaminants in soil or groundwater?
 6. Uncertainty in the current state of knowledge regarding the modified fuel should be discussed throughout the data package and key uncertainties should be identified. If experimental data is provided, standards, tests, and

experiments used to generate this data must be fully described, and discussed along with proper experimental controls. Whenever possible standardized methodologies should be employed.

- a. Test data quality (data uncertainty, precision and accuracy, and statistical design recommendations)
- b. Evaluation of uncertainty (models, test data, surrogate chemicals, and applicability of testing data)

B. Toxicity Tests

C. Additional toxicity tests beyond the standard acute or chronic toxicity testing used in ecological risk analyses

D. Additional Tests

1. Taste and odor characteristics in drinking water?
2. Effects on color/clarity of water?

E. Calculations

1. Risk calculation
2. Potential toxic effect calculation

VI. Third Tier: Final Multimedia Risk Assessment Elements

Third tier: Final product is produced and used as the basis for the recommendations that go to the Environmental Policy Council. This final product is also peer reviewed.

A. Summary of Preliminary Review and Experimental Design Review

B. Output of Risk Assessment

1. A screening risk analysis for potential environmental, and resource impacts that may result from the identified most hazardous and/or likely release scenarios. This risk analysis typically would address questions such as:
 - a. Results of aquatic toxicity tests, including benthic, fish and phytotoxicity.

C. Release Scenarios-

1. Description of the potential environmental release scenarios of the modified fuel and the additive package from a life cycle perspective including an evaluation of which scenarios pose the greatest threat to human health, the environment, and beneficial use of water resources. This evaluation will also

include an estimation of the likelihood of occurrence for each scenario and the basis for that estimate.

2. Possible release scenarios that should be considered include:
 - a. Catastrophic release of the modified fuel or the additive package during rail or truck transport into California. Releases to both freshwater and marine environments should be considered.
 - b. Catastrophic release of the modified fuel or additive package from an underground storage tank
 - c. Release of additive package or the modified fuel from a bulk storage container at mixing facility
 - d. Slow release of the modified fuel or additive package from an underground storage tank
 - e. Additional release scenarios as appropriate for fuel or additive and identified by the State of California or peer reviewers.
3. Air Releases of Criteria Pollutants, Green House Gases, Toxic Air Contaminants, and Ozone Precursors
 - a. Exhaust emissions
 - b. Evaporative emissions
 - c. Other (Manufacturing and Production, Accidental, Transport)

D. Exposure Pathways

1. Identify potential exposure pathways on the additive and candidate fuel components
 - a. Compare CARB fuels
 - b. Primary Exposure Pathways
 - c. Secondary Exposure Pathways

E. Fate and Transport Mechanisms

1. Air, Water, and Soil
2. Biodegradation and transformation issues

F. Bioaccumulation

G. Exposure to both Human and Ecological Receptors

1. Chronic exposure
2. Acute exposure
3. Human exposure for multiple media

- a. Air
 - b. Water
 - c. Soil and groundwater
4. Exposure and toxicity to other organisms

H. Risk Determination

1. Impact on human health and the environment resulting from the production, use, and disposal of additive/fuel.
2. Impacts on Air Quality
 - a. Air Basins with highest impact

I. Environmental Risk and Waste Management Issues

1. How would a release of the modified fuel respond to standard petroleum cleanup technology and strategies?
2. Would the modified fuel be easier or harder to cleanup?
3. If a spill occurred, would the contaminated soils be a hazardous waste?
4. If the soil is a hazardous waste, what is the appropriate management of the contaminated soil?
5. What hazardous waste is generated in the manufacturing process of the components of the additive package or the modified fuel?
6. If the additive package or the modified fuel were discarded, would the waste be a RCRA hazardous waste or a non-RCRA hazardous waste?
7. What would be the appropriate management of the hazardous waste?