California Environmental Protection Agency

Multimedia Workgroup

Briefing for Council Members

Multimedia Evaluations of Biodiesel and Renewable Diesel

June 2015

Why is ARB Interested in Biodiesel and Renewable Diesel?

- Both are low carbon and renewable fuels
- Air quality benefits in toxics, PM, HC, CO_2
- Key strategies for Low Carbon Fuel Std.
- 2030 goal of 40% GHG reduction
- 2030 goal of 50% reduction in petroleum use
- Federal Renewable Fuel Standard 2

Multimedia Evaluation (MME)

- Definition – *Identification and evaluation of **any significant adverse impact** on public health or the environment, including air, water, or soil, that may result from the production, use, or disposal of the motor vehicle fuel that may be used to meet the state board's motor vehicle fuel specifications.* (HSC 43830.8)

- Requirements
  - ✓ MME required before motor vehicle fuel specifications are established
  - ✓ Must address:
    - *Emissions of air pollutants*
    - *Contamination of surface water, groundwater, and soil*
    - *Disposal or use of byproducts and waste materials*
  - ✓ Summary of MME – Multimedia Working Group (MMWG) Staff Report
  - ✓ External Scientific Peer Review
  - ✓ CA Environmental Policy Council (CEPC) Review
  - ✓ CEPC determination of significant impact, less adverse alternatives

CEPC and MMWG

- CEPC
  - Established pursuant to Public Resources Code 71017
  - Council Members
    - *Matthew Rodriquez*, Agency Secretary
    - *Mary D. Nichols*, Chairman, ARB
    - *Lauren Ziese*, Acting Director, OEHHA
    - *Felicia Marcus*, Chairman, Waterboard
    - *Barbara A. Lee*, Director, DTSC
    - *Brian R. Leahy*, Director, DPR
    - *Caroll Mortensen*, Director, CalRecycle

- MMWG
  - Oversees MME process
  - Reviews reports; prepares MME Staff Report
  - Makes recommendations to CEPC
  - Members: ARB, DTSC, OEHHA, Waterboard, OSFM

California Environmental Policy Council Shall:

Determine whether proposed regulation will cause significant adverse impact on public health or environment, whether less-adverse alternatives exist

- No significant adverse impact and no less-adverse alternatives – No further action dictated
- Significant adverse impact or less harmful alternatives exist – Council recommends alternative measures to reduce impacts

ARB MMEs Considered by CEPC

- 2011 – Viscon-Treated Diesel Fuel as verified Diesel Emission Control strategy (vDECS)
- 2004 – PuriNOx-Treated Diesel Fuel as vDECS
- 2004 – Amendments to the California Diesel Fuel Regulations
- 1999 – Ethanol Used in California Reformulated Gasoline

Procedural Requirements/Elements

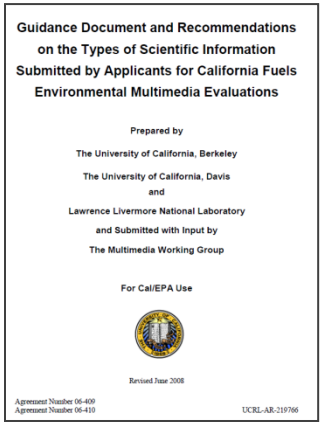
- Bagley-Keene Act applies to EPC:
  - Agenda and notice must be published by June 12
  - Limits on discussions between EPC members
- CEQA does not apply:
  - Ultimate approval authority lies with ARB, not EPC
  - Impact analysis of MME varies from CEQA analysis
- Conduct of hearing:
  - Legal adviser to EPC (TBD)
  - Each BDO on MMWG will have a presentation
  - Staff will respond to questions from EPC members, but not directly to public comment unless EPC members asked for staff response

Multimedia Evaluation Process

Tier I
Work Plan

Work Plan

- Define framework and scope
- Identify key knowledge gaps
- Feedback provided


Guidance Document and Recommendations on the Types of Scientific Information Submitted by Applicants for California Fuels Environmental Multimedia Evaluations

Prepared by

The University of California, Berkeley

The University of California, Davis

and

Lawrence Livermore National Laboratory

and Submitted with Input by

The Multimedia Working Group

For Cal/EPA Use

Revised June 2008

Agreement Number 06-409
Agreement Number 06-410

UCRL-AR-219766

Tier II
Risk Assessment Protocol

Risk Assessment Protocol

- Experimental design developed and submitted
- Protocol reviewed, feedback provided

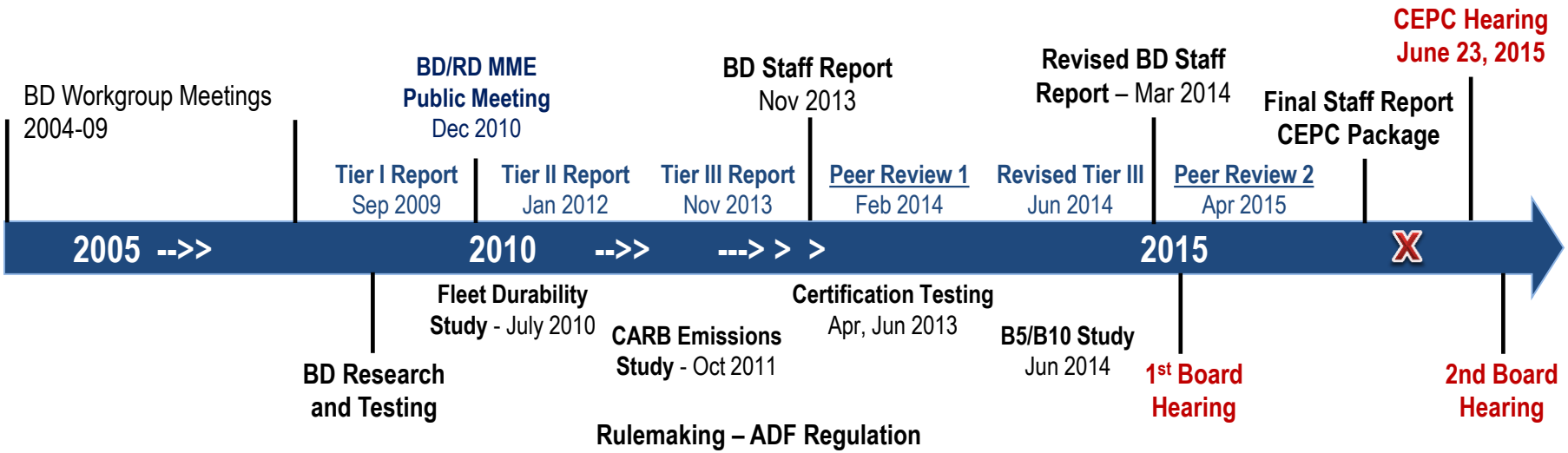
Final Report Risk Assessment

- Execution of MME Risk Assessment
- Final report used as basis for MMWG recommendations

Tier III
Multimedia Risk Assessment Final Report

Multimedia Evaluation Guidance Document , June 2008

Biodiesel Overview



13 Contracts and Grants – Biodiesel Research Studies, Testing, and Multimedia Evaluation

- Contractors/Recipients – UCD, UCB, UCR
- Total Funding ~ $3 million

Biodiesel Peer Review Process

- Initial Peer Review: Nov 2013 - Feb 2014
  - 7 reviewers; 4 areas of expertise (air, water, soil, public health)
  - Support MMWG conclusions, which are based on sound scientific knowledge, methods, and practices
  - 2 reviewers provided emerging public health information on oxidative stress and inflammation
  - New B5/B10 Biodiesel Study published June 2014, ARB updated ADF Regulation
- Supplemental Peer Review: Dec 2014 - Apr 2015
  - 4 original reviewers; 2 areas of expertise (air, public health)
  - Limited to OEHHA public health evaluation (oxidative stress and inflammation) and new B5/B10 Biodiesel Study
  - Confirm support of MMWG conclusions

Biodiesel Conclusions

Air:

ARB concludes that with in-use requirements, BD, as specified in the MME and proposed regulation, does not pose a significant adverse impact on public health or the environment from potential air quality impacts.

Water:

Water Board concludes that given the information provided by the UC researchers, biodiesel presents minimal additional risks to beneficial uses of CA waters than that posed by CARB diesel. Water Board supports the MME of BD, which meets the ASTM specifications, and the finding of no significant adverse impact on public health or the environment.

Biodiesel Conclusions (*Continued*)

Public Health:

OEHHA concludes that the information currently available indicates a reduction in cancer risk from the use of biodiesel and a reduction in GHG emissions, which are associated with a myriad of environmental and public health impacts. It is difficult to state with certainty that the use of BD will decrease cardiovascular or respiratory health risks because of the uncertainty introduced by recent studies that provide some evidence for increased oxidative stress and inflammatory response to BD emissions relative to petroleum diesel particles on a mass basis. The reduction in PM and other emissions may offset this potential increased inflammatory response. CEPC may want to emphasize in its determination the continued importance of emissions controls for BD fueled engines, as has been the emphasis for petroleum diesel fuel engines.

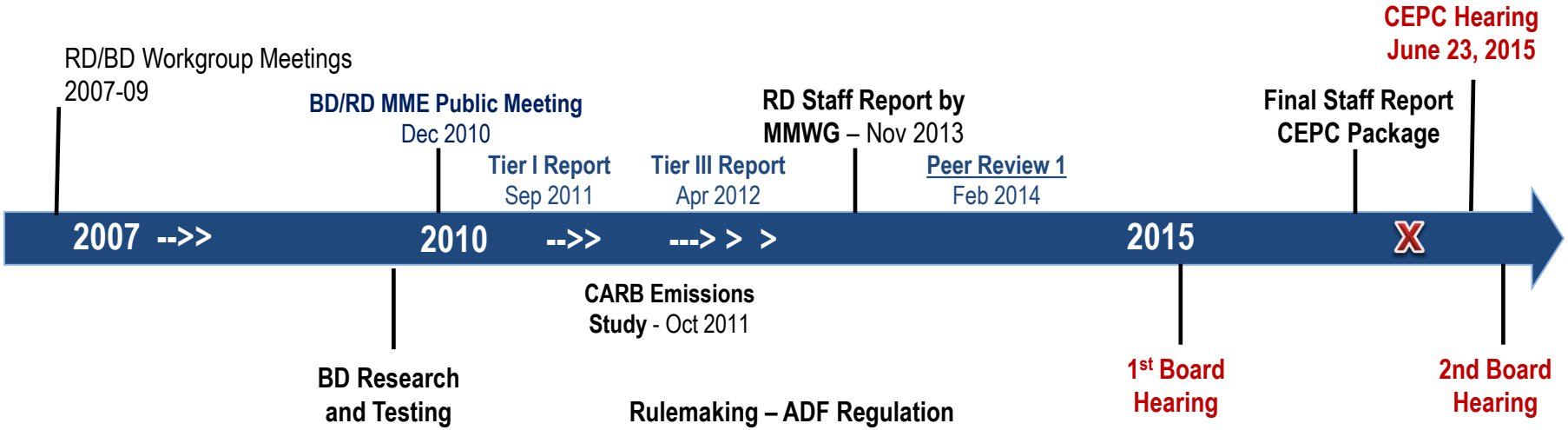
Soil and Hazardous Waste:

DTSC concludes that BD aerobically biodegrades more readily than CARB diesel. Also, some additized biodiesel preliminarily has a higher aquatic toxicity for a small subset of tested species, but further testing is needed to determine a causal relationship. In general, BD has no significant difference in vadose zone infiltration rate. BD's infiltration rate from animal fat appeared to be similar to CARB diesel. However, biodiesel left a noticeable increase in the residual's vertical dimension and spread less extensive horizontally.

Biodiesel Recommendations

- Use of biodiesel does not pose a significant adverse impact compared to CARB diesel fuel
- Conditions
  - Must meet ADF requirements
  - Review:
    - Any new BD formulations/additives
    - New oxidative stress and inflammation literature
    - BD use in light of emerging information

Renewable Diesel Overview



4 Contracts and Grants – RD Elements of BD Research Studies and Testing, and RD Multimedia Evaluation

- Contractors/Recipients – UCD, UCB, UCR
- Total Funding ~ $1 million

Renewable Diesel Peer Review

Peer Review: Nov 2013 - Feb 2014

- 7 reviewers; 4 areas of expertise (air, water, soil, public health)
- Support MMWG conclusions, which are based on sound scientific knowledge, methods, and practices
- No issues raised

Renewable Diesel Conclusions

Air:

Based on a relative comparison between CARB diesel and hydrotreated vegetable oil renewable diesel (HVORD), ARB staff concludes that the use of renewable diesel and the resulting air emissions do not pose a significant adverse impact on public health or the environment.

Water:

Waterboard staff concludes that given the information provided by the UC researchers, and the similarities of renewable diesel and CARB diesel, renewable diesel presents minimal additional risks to beneficial uses of California waters than that posed by CARB diesel alone. Waterboard staff supports the multimedia evaluation of renewable diesel that meets ASTM D975 and the finding of no significant adverse impacts on public health or the environment.

Renewable Diesel Conclusions

Public Health:

OEHHA scientists conclude that use of renewable diesel fuel produced by hydrotreating fatty acids from vegetable oil may reduce the amount of PM and aromatic organic chemicals that is released into the atmosphere in diesel engine exhaust.

Soil and Hazardous Waste:

In comparing renewable diesel with CARB diesel, DTSC's review concludes that the chemical compositions of renewable diesel are almost identical to that of CARB diesel. Therefore, the impacts on human health and the environment in the case of a spill to soil, groundwater, and surface waters would be expected to be similar to those of CARB diesel. Based on the current production, use, transportation, and storage of renewable diesel in California, renewable diesel will not increase the potential negative impacts to human health and the environment.

Renewable Diesel Recommendations

- Use of renewable diesel does not pose a significant adverse impact
- Conditions
  - Must meet CARB diesel specifications
  - Review:
    - New RD formulations/additives
    - RD use in light of emerging information

Proposed Alternative Diesel Fuel (ADF) Regulation

- Creates pathway for commercialization of emerging ADF
- Establishes Biodiesel specifications as ADF
- In-use requirements to preclude NOx increase from legacy fleet
- RD can be used to mitigate NOx from BD
- Exemption for advanced new technology diesel engines with selective catalytic reduction
- Sunset for in-use requirements in 2022 timeframe

Proposed Schedule

TASK	DATE
CEPC Briefings	Late May - Early June
Hearing Notice Released to Public	June 12
Final CEPC Hearing Documents Due to Cal/EPA	June 16
CEPC Hearing	**June 23, 2015**
ARB Hearing on Proposed ADF Regulation	**July 23, 2015**