

February 28, 2011

Office of Environmental Information (OEI)
Mail Code: 2822T
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

ATTN: Docket ID EPA-HQ-ORD-2010-1077

Re: Comments of the Renewable Fuels Association in response to Availability of Draft Report, "Biofuels and the Environment: First Triennial Report to Congress" 76 Fed. Reg. 5,154 (January 28, 2011).

Dear Docket Clerk,

The Renewable Fuels Association (RFA) is pleased to submit the attached comments regarding EPA's draft report, "Biofuels and the Environment: First Triennial Report to Congress."

As you will see in our comments, RFA is greatly concerned that EPA has misinterpreted and expanded the scope of the triennial report as established by the Energy Independence and Security Act (EISA). Specifically, EISA compels EPA to assess only those environmental impacts that are *likely* to result from the requirements of the Renewable Fuels Standard (RFS). Unfortunately, EPA's draft report seems to raise every conceivable environmental problem that could possibly arise from biofuels expansion, without any regard for the actual likelihood that the problem will occur. Further, EPA neglects the EISA requirement to assess environmental impacts of the RFS "to date," choosing instead to focus on highly speculative potential future impacts. In addition, the draft report makes no attempt whatsoever to compare the potential environmental impacts of biofuels to the impacts of the fossil fuels that are being displaced.

We believe the preponderance of scientific evidence shows that the potential environmental risks associated with biofuels expansion can be effectively mitigated through existing regulations, best management practices, efficiency gains, and technology adoption. As such, we believe the RFS, and biofuels in general, offer vast potential to provide important environmental services while displacing substantial volumes of fossil fuels.

In closing, RFA believes the draft report's general approach and content should be substantively reconsidered before finalization and submission to Congress. Additionally, we are requesting a meeting with the appropriate EPA staff to discuss the attached comments and our general concerns with the draft report. Thank you for considering our comments.

Sincerely,



Bob Dinneen
President and CEO

COMMENTS OF THE RENEWABLE FUELS ASSOCIATION

AVAILABILITY OF DRAFT REPORT, BIOFUELS AND THE ENVIRONMENT: FIRST TRIENNIAL REPORT TO CONGRESS; NOTICE OF PEER REVIEW MEETING AND PUBLIC COMMENT PERIOD, 76 FED. REG. 5,154 (JANUARY 28, 2011)

**DOCKET ID
EPA-HQ-ORD-2010-1077**

I. INTRODUCTION

The Renewable Fuels Association (RFA) submits these comments on EPA's Preliminary Draft Report, "Biofuels and the Environment: First Triennial Report to Congress." (EPA/600/R-10/183A, January 2011).

RFA is the leading trade association for America's ethanol industry. Its mission is to advance the development, production, and use of fuel ethanol by strengthening America's ethanol industry and raising awareness about the benefits of renewable fuels. Founded in 1981, RFA represents a large portion of the U.S. ethanol industry and serves as the premier meeting ground for industry leaders and supporters. RFA's 300-plus members are working to help America become cleaner, safer, more energy secure and more economically vibrant.

RFA has worked to make the Renewable Fuel Standard (RFS) program a successful model for reducing dependence on foreign oil since its inception in 2005. The RFS was first established by Congress in the Energy Policy Act of 2005 (EPAct), and the Energy Independence and Security Act (EISA) substantially expanded the volume of renewable fuel required to be used in the United States each year. Congress passed and expanded the RFS in recognition of the numerous benefits of renewable fuels, including ethanol. Ethanol is a clean, energy efficient, environmentally friendly fuel. It is produced at facilities that create jobs and economic opportunity for the communities across the country. The RFS program is a vital part of the energy policy of this country, as it moves the nation toward less dependence on foreign oil. The RFS program also provides for substantial reductions in greenhouse gas (GHG) emissions from transportation fuels.

EISA established that EPA shall assess and report to Congress every three years on the environmental impacts of RFS requirements. Unfortunately, EPA's first draft triennial report substantively fails to comport with the EISA provisions that establish the scope and requirements of the assessment. Further, the draft report wholly fails to provide a balanced and meaningful view of the current and potential environmental impacts of the RFS.

As discussed in these comments, RFA believes the draft report's general approach and content should be substantively reconsidered. Further, we believe significant revisions are needed before the report can reasonably be finalized and submitted to Congress for consideration.

II. EPA MISINTERPRETS AND EXPANDS THE SCOPE OF THE TRIENNIAL REPORT AS ESTABLISHED BY SECTION 204 OF THE ENERGY INDEPENDENCE AND SECURITY ACT (EISA).

Section 204 of EISA requires EPA to report to Congress every three years on the environmental and natural resource impacts associated with the requirements of the Renewable Fuels Standard (RFS). The EISA language establishing this requirement explicitly defines the intended scope of the assessment and specifies certain environmental factors that must be considered by EPA. Section 204(a) of EISA is reproduced below:

(a) IN GENERAL.—Not later than 3 years after the enactment of this section and every 3 years thereafter, the Administrator of the Environmental Protection Agency, in consultation with the Secretary of Agriculture and Secretary of Energy, shall assess and report to Congress on the impacts to date and likely future impacts of the requirements of Section 211(o) of the Clean Air Act on the following:

(1) Environmental issues, including air quality, effects on hypoxia, pesticides, sediment, nutrient and pathogen levels in waters, acreage and function of waters, and soil environmental quality.

(2) Resource conservation issues, including soil conservation, water availability, and ecosystem health and biodiversity, including impacts on forests, grasslands, and wetlands.

(3) The growth and use of cultivated invasive or noxious plants and their impacts on the environment and agriculture.

In advance of preparing the report required by this subsection, the Administrator may seek the views of the National Academy of Sciences or another appropriate independent research institute. The report shall include the annual volume of imported renewable fuels and feedstocks for renewable fuels, and the environmental impacts outside the United States of producing such fuels and feedstocks. The report required by this subsection shall include recommendations for actions to address any adverse impacts found.

Based on the language in Section 204, the EPA draft report clearly exceeds the intended scope as established by Congress. EPA should reevaluate the scope and ensure that the final report to Congress addresses only those issues that the agency is authorized to consider.

- a. *EPA Makes No Attempt to Determine the Probability or Likelihood of the Identified Potential Environmental Impacts Actually Occurring in the Future.*

EISA Section 204 explicitly requires EPA to assess “...the **likely** future impacts of the requirements of Section 211(o) of the Clean Air Act (emphasis added).” However, the EPA report seems to identify every conceivable potentially negative impact associated with biofuels expansion, rather than focusing only on those future impacts that appear most likely or most damaging. Every potential problem associated with biofuels growth is given

equal weight and addressed without regard to the actual risk or likelihood that the problem will occur. This approach may give readers of the draft report the impression that each potential environmental impact identified by EPA is “likely” to occur. To clarify this issue, EPA should develop a methodology to determine which of the identified impacts truly are “likely” to occur and principally focus its analysis on those potential impacts.

- b. *EISA Section 204 Requires EPA to Assess Only the Likely Future Environmental Impacts of Section 211(o) of the Clean Air Act, Not the Potential Future Impacts of “Increased Biofuel Production and Use.”*

In the draft report, EPA states that it must “...report to Congress every three years on the environmental and resource conservation impacts of *increased biofuel production and use* (emphasis added)...” Clearly, this statement misconstrues the actual requirement of Section 204, which is to assess and report only on the likely impacts “of the requirements of Section 211(o) of the Clean Air Act.” EPA should not assume that the impacts of “increased biofuel production and use” are solely the result of implementation of the requirements of Section 211(o) of the Clean Air Act, which contains the expanded RFS. While the RFS is an important driver of biofuels production and use, it is not the singular factor influencing growth in biofuels output and consumption. For example, high oil prices can increase demand for biofuels independent of RFS requirements. Similarly, strong global demand for ethanol may result in increased ethanol production and exportation from the United States, regardless of RFS requirements. Therefore, EPA should be careful to clearly demarcate those impacts that are a direct result of the RFS requirements from those impacts that result from other factors driving increased biofuels production and use.

- c. *EISA Section 204 Does Not Authorize or Compel EPA to Assess Potential Indirect Land Use Change (ILUC) Impacts as Part of the Triennial Report to Congress.*

Section 204 requires that “...the report shall include the annual volume of imported renewable fuels and feedstocks for renewable fuels, and the environmental impacts *outside the United States of producing such fuels and feedstocks* (emphasis added).” Clearly, this requirement is in reference to biofuel feedstocks and biofuels that are produced outside of the United States and imported into the United States in response to the RFS. That is, EPA is required by Section 204 to examine the environmental impacts of imported biofuels and feedstocks in their country of origin. As an example, EPA should consider the environmental impacts in Brazil of producing sugarcane ethanol that is then exported to the United States for the purposes of RFS compliance. These potential impacts would be considered direct environmental impacts associated with producing and exporting biofuels to the United States.

EPA apparently has interpreted this requirement as allowing the agency to assess the potential environmental impacts *outside* the United States that theoretically result from increased production of biofuels and biofuel feedstocks *inside* the United States. These potential impacts would be considered indirect in nature, and it is clearly not the intent of EISA Section 204 to include a speculative assessment of these impacts in the triennial report. In the draft report's discussion of "International Considerations," EPA focuses much attention on the notion of ILUC and heavily references literature that speculates on the possible ILUC effects of increased biofuels production. In keeping with the intended scope of the study, EPA should refrain from extensive discussion and speculation on ILUC.

- d. *EPA Largely Disregards the Section 204 Requirement to Assess the "Impacts to Date" of the Requirements of Section 211(o) of the Clean Air Act, Choosing Instead to Focus on Highly Uncertain and Speculative Potential Future Impacts.*

In addition to calling on EPA to assess "likely future impacts," EISA Section 204 requires the agency to assess "impacts to date." However, there is virtually no discussion in the draft report of actual, verified environmental impacts to date resulting from implementation of the RFS. Aside from general discussion of recent acreage shifts that may have occurred in part because of the RFS, there is very little quantitative analysis of actual environmental impacts related to RFS implementation. Rather than focusing almost exclusively on potential future impacts, EPA should give equal weight to characterizing and quantifying actual impacts from recent years.

III. THE EPA DRAFT REPORT FAILS TO COMPARE THE POTENTIAL ENVIRONMENTAL RISKS AND BENEFITS OF BIOFUELS REGULATED UNDER THE RFS TO THE PETROLEUM BASELINE.

The draft report acknowledges that biofuels required under EISA are "...expected to achieve a 138-million metric ton reduction in CO₂ equivalent emissions by 2022 compared to continued reliance on petroleum-based fuels." But beyond this brief comparison of the GHG benefits of biofuels relative to baseline petroleum fuels, there are no comparisons of the impacts of biofuels and petroleum fuels on water quality and quantity, air quality, soil quality, ecosystems and biodiversity.

The relative impacts of one particular energy option simply cannot be fairly determined unless they are uniformly compared to the impacts of competing energy options. Indeed, the authors of the EPA draft report recognize that the qualitative assessments in the paper have little value when not compared to the attributes of other energy options. EPA states, "While this report provides a starting point for comparing the relative impacts associated with a range of different biofuel feedstock and production processes, it will also be useful to assess biofuel impacts in the larger context of the conventional petroleum fuels that are being displaced under the RFS2 mandates." Similarly, when presenting their qualitative assessments of biofuels impacts, the authors state that, "No attempt has been made to

compare [biofuels] impacts to those of petroleum production, nor do impacts represent possible environmental benefits gained by petroleum displacement.”

The draft report suggests EPA will consider a comparison to the petroleum baseline for its next triennial report in 2013. Although the RFS baseline is comprised of 2005-era petroleum, EPA can and should account for the potential environmental impacts of changes in petroleum sources over time. The 2005 petroleum baseline does not adequately address the increasing use of marginal sources of petroleum. In comparing the relative risks and benefits of future fuel options, EPA cannot ignore the fact that the resource base for conventional liquid fuels is declining and that new volumes of biofuels are displacing and delaying the need for unconventional high-carbon sources of petroleum. It is a basic tenet of lifecycle analysis that the potential environmental impacts of a particular biofuel should be compared to the potential impacts of the fuel it is most likely displacing (ISO, 2006).¹

While it is encouraging that EPA plans to consider a comparison to fossil fuels in its 2013 assessment, the failure to include such comparisons in the current report substantially limits its value as a reasonable decision-making tool. In the final report, EPA should clearly emphasize that the conclusions are to be interpreted with caution insofar as the potential environmental impacts of the biofuels were not compared to the potential impacts of the petroleum fuels they replace.

IV. THE LITERATURE CITED BY EPA FOR THE DRAFT REPORT IS UNBALANCED, LEADING THE AUTHORS TO FOCUS DISPROPORTIONALLY ON POTENTIAL NEGATIVE ENVIRONMENTAL IMPACTS AND LARGELY OVERLOOK POTENTIAL POSITIVE IMPACTS.

Nothing in Section 204 of EISA compels EPA to focus its assessment only on potential *negative* environmental impacts of implementing the RFS. Yet, the draft report overwhelmingly concentrates on the possible adverse consequences of expanding biofuels production and use. The preponderance of scientific evidence suggests that if environmental risks are properly managed or mitigated, biofuels offer vast potential to provide important environmental services while displacing substantial volumes of fossil fuels. It is unfortunate that the draft EPA report largely disregards the current and potential future benefits of biofuels related to water quality, soil quality, air quality, ecosystems and wildlife, and other environmental and natural resource attributes.

It appears that the unbalanced treatment of potential risks and benefits in the draft report stems from the fact that the authors overlooked several important research papers and other resources that highlight the current and potential environmental benefits of biofuels. Much has been written about the potential of biofuels to enhance environmental quality

¹ A key principle of the ISO Standard 14040 is to utilize appropriate system boundaries to make valid comparisons.

while significantly displacing fossil fuels.² However, the literature review conducted by EPA for the draft report appears to have focused on reports that speculate mostly on the potential adverse impacts of biofuels expansion.

For example, in the report's sections on potential environmental impacts of feedstock production and possible international considerations, the authors prominently cite research on ILUC conducted by Searchinger et al. (2008). Aside from the fact that Section 204 of EISA does not specifically authorize the EPA to assess ILUC for the triennial report, it is important to note that the Searchinger report has been the subject of heated debate and disagreement. There have been numerous critiques of the Searchinger methodology and the assumptions and data used.³ Among the flawed assumptions and methodological choices identified are (a) inclusion of unrealistic estimates of ethanol production by 2015, all of which is assumed to be derived from corn (double the amount required by the EISA); (b) failure to incorporate technological advances in agriculture and biofuels; (c) questionable assumptions regarding types of land converted; (d) reliance on satellite data that has significant misclassification problems and that was based on a time period where land use changes were driven by rapid industrial growth and were subject to little or no regulatory control; and (e) inclusion of flawed assumptions regarding distillers grain displacement. Mathews & Tan (2009) of Macquarie University in Australia subjected the Searchinger paper to strict scrutiny, finding it better described "as ideology than as science."

The authors of the EPA draft report do not discuss these numerous critiques of Searchinger et al., nor do they mention that its findings have been the subject of intense academic debate since it was originally published. The EPA report also failed to mention that more recent research on ILUC sponsored by the Department of Energy (Tyner et al., 2010) found potential ILUC emissions possibly related to corn ethanol expansion to be less than 15% of the amount originally estimated by Searchinger. Additional research by the Department of Energy's Oak Ridge National Laboratory (Oladosu & Kline, 2010) found "**...minimal to zero indirect land use change was induced by use of corn for ethanol over the last decade** (emphasis added)." The Oak Ridge findings are based on a rigorous examination of empirical data from the 2001-2008 time period, a span in which U.S. ethanol production more than quadrupled. The researchers found that "Empirical evidence does not support significant effects on U.S. commodity exports [and] other crops or cropland expansion in the U.S."

² For a recent example, see Dale et al. (2010).

³ See Wang and Haq Letter to *Science* (Mar. 2008); Dept. of Energy Response to Searchinger (Mar. 2008); Dale Letter to *Science* (Feb. 2008); Sheehan Letter to *Science* (Feb. 2008); Morris (2008); Darlington (Feb. 2009); Mathews and Tan (2009).

The example of unbalanced literature related to the report’s discussion of ILUC is particularly poignant because many of the potential negative environmental impacts cited by EPA stem from the notion that biofuels expansion will induce land use change. But the ILUC example is not the only example of unbalanced citations from the literature. EPA appears to have also overlooked research addressing the positive air quality benefits of biofuels, as well as additional research focused on other beneficial impacts. Research has shown blending ethanol into gasoline can favorably impact mobile source emissions in at least four main air quality areas: fine particulate matter (e.g., PM2.5), carbon monoxide, toxics, and global warming.⁴

RFA plans to submit to the docket a comprehensive list of peer-reviewed, published research that highlights the current and potential future environmental benefits of first- and second-generation biofuels. In general, EPA should strive to ensure that it is considering the full range of literature on the potential environmental impacts of biofuels—both negative *and* positive. Further, EPA should clearly identify potential impacts—such as land use change—that are not well understood and for which scientific understanding and consensus are lacking.

V. EPA’S REPORT LARGELY OVERLOOKS THE ABILITY OF EXISTING REGULATIONS, BEST MANAGEMENT PRACTICES, CO-PRODUCTS, EFFICIENCY GAINS, AND TECHNOLOGY ADOPTION TO MITIGATE POTENTIAL ENVIRONMENTAL RISKS.

The draft report often fails to recognize that many of the potential environmental risks posed by biofuels expansion are likely to be mitigated through existing regulations, best management practices, efficiency gains, and technology adoption. Indeed, in the “Conclusions and Recommendations” section of the draft report, the authors include the important caveat that, “These conclusions do not account for existing or potential future mitigation measures or regulations.” Additionally, the production and use of biofuel co-products, such as distillers grains from the corn ethanol dry milling process, greatly reduces pressure on land resources by displacing traditional feed ingredients from livestock and poultry feed rations.

- a. *Many Biofuels and Agricultural Supply Chain Activities are Already Subject to Regulations Designed to Mitigate the Types of Environmental Risks Discussed in the Draft Report.*

The EPA authors acknowledge that “Many existing environmental programs and regulations are applicable to the biofuel supply chain, including feedstock production and logistics; biofuel production and distribution, and biofuel use.” Further, after a brief description of some of the environmental laws and regulations that apply to biofuels and

⁴ See McKone (2009).

feedstock producers, the report states, “These statutes provide opportunities within the existing regulatory framework to regulate and mitigate some of the potential adverse health and environmental effects of biofuels.” Yet, despite these general acknowledgements, the bulk of EPA’s discussion on potential environmental risks neglects to consider the ability of specific statutes, regulations, and associated best management practices to mitigate specific environmental risks. As one example, EPA briefly discusses the safeguards against U.S. cropland expansion that are written into EISA (i.e., the “renewable biomass” definition), but then prominently cites “conversion of uncultivated land” in Table 3-2 as an “impact associated with biofuel feedstock production.” EPA’s report should clearly indicate specific potential environmental impacts that may be mitigated through compliance with specific existing regulatory programs.

b. *The Ability of Efficiency Gains and Technology Adoption to Mitigate Potential Environmental Impacts is Largely Overlooked in the Draft Report.*

The draft EPA report makes a few general references to efficiency gains in feedstock cultivation and biofuel production, but the ability of efficiency improvements to mitigate potential environmental risks is largely diminished. Further, the report fails to properly recognize the impact of rapid technology development and adoption over the past several decades for both feedstock cultivation and biofuel production.

Higher feedstock yields have been achieved through better technology and farming practices, not through increased use of fertilizers, pesticides and other inputs. According to a recent report (Keystone Alliance, 2009) released by a multi-stakeholder group that included Conservation International, the Nature Conservancy, Environmental Defense Fund, World Wildlife Funds and others, the following improvements in corn production occurred between 1987 and 2007: 27% decrease in irrigation water use per bushel; 30% reduction in GHG emissions per bushel; 37% decrease in the land required per bushel; 37% decrease in energy required per bushel; and 69% reduction in soil loss per bushel. Productivity gains have greatly reduced the GHG intensity and land use requirements of feedstock production. A recent paper published in the *Proceedings of the National Academies of Sciences* (Burney et al., 2010) found:

...the net effect of higher yields has avoided emissions of up to 161 gigatons of carbon (GtC) (590 GtCO_{2e}) since 1961. We estimate that each dollar invested in agricultural yields has resulted in 68 fewer kgC (249 kgCO_{2e}) emissions relative to 1961 technology (\$14.74/tC, or ~\$4/tCO_{2e}), avoiding 3.6 GtC (13.1 GtCO_{2e}) per year. Our analysis indicates that investment in yield improvements compares favorably with other commonly proposed mitigation

strategies. Further yield improvements should therefore be prominent among efforts to reduce future GHG emissions.

Meanwhile, similar advancements have occurred in ethanol production efficiency at the biorefinery. A recent paper published in *Biotechnology Letters* (Mueller, 2010) noted the following improvements at corn ethanol dry mills between 2001 and 2008: A 28 percent reduction in thermal energy use; a 32 percent reduction in electricity use; an improvement of 5.3 percent in ethanol yield per bushel of grain; and average total water use of 2.72 gallons per gallon of ethanol produced, down significantly from previous estimates.

Such efficiency improvements have led to a significant reduction in the GHG intensity of producing ethanol from grain. A recent paper published in the *Journal of Industrial Ecology* (Liska et al., 2009) found that, “Direct effect GHG emissions were estimated to be equivalent to a 48 percent to 59 percent reduction compared to gasoline, a twofold to threefold greater reduction than reported in previous studies.”

These improvements will continue as new technologies are introduced and the industry continues to evolve. A recent paper published in the journal *Energy Policy* (Hettinga et al., 2008) states, “For the future, it is estimated that solely due to technological learning, production costs of ethanol may decline 28–44 percent.” The article further states, “Future improvements in energy efficiency may lead to lower costs, but also to lower GHG emissions.”

EPA should ensure that its final report properly recognizes the historical ability of efficiency gains and technology adoption to mollify environmental risks. Further, the final report should more thoroughly examine the potential of efficiency gains and technology adoption to mitigate potential future environmental impacts associated with implementing the RFS.

c. *Discussion of the Positive Environmental Impacts of Biofuel Co-products is Entirely Omitted from the Draft Report.*

The production of ethanol from grain results in the co-production of animal feed, most often referred to as “distillers grains” or “DDGS.” The grain ethanol process converts only the starch portion of the grain into ethanol, while the remaining fats, proteins, and other nutrients remain available for use as animal feed. These feed co-products play an important role in mitigating pressure on land resources.

In the 2009/10 marketing year, it is estimated that U.S. ethanol producers generated approximately 36 million metric tons of animal feed. Of this total, approximately one-quarter was exported to countries around the world. Indeed, the draft EPA report

recognizes that “...DDGS has become an increasingly important feed component for confined livestock.” The authors further state correctly that, “About one-third of the corn processed into ethanol is converted into DDGS.” In other words, one acre of corn used for ethanol returns at least one-third of an acre’s worth of feed to the global animal feed market.⁵ Yet, despite this recognition, the draft report fails to discuss the impact of co-products on overall grain ethanol land requirements. For example, the report states, “Approximately 4.6 billion bushels of corn from the 2009 harvest were used to produce corn ethanol.” While this statement is true on a gross basis, as EPA has acknowledged, one-third of every bushel processed into ethanol returns to the feed market. Thus, on a net basis, the equivalent of approximately 3.1 billion bushels were used for ethanol, while the equivalent of 1.5 billion bushels were processed into animal feed. The final EPA report’s discussion of RFS land requirements should take into account the land use “credit” that results from animal feed co-products.

Further, the use of distillers grains in livestock and poultry rations offers certain environmental and animal health benefits that were overlooked by EPA in the draft report. For example, animal scientists have determined that feeding distillers grains to cattle reduces enteric methane loss (McGinn et al., 2009). In fact, the lifecycle GHG analysis conducted by EPA for the RFS final rule included a GHG reduction “credit” that resulted from increased feeding of distillers grains (U.S. EPA, 2010). According to the EPA’s Regulatory Impact Analysis for the RFS final rule:

Use of DGS has been shown to decrease methane produced from enteric fermentation if replacing corn as animal feed. This is due to the fact that the DGS are a more efficient feed source. Consistent with our assumptions regarding the efficiency of DGS as an animal feed in our agricultural sector modeling, we have also included the enteric fermentation methane reductions of DGS use in our final rule analysis.

Unfortunately, EPA’s draft triennial report chose only to focus on potential negative impacts associated with increased feeding of distillers grains. EPA should consider the full range of literature on the environmental and animal health impacts of feeding distillers grains and other ethanol co-products.

Additionally, in its discussion of potential future environmental impacts, EPA should examine the likely environmental effects of emerging co-products for first-generation feedstocks and biofuels (e.g., crude corn oil from dry mill ethanol plants), as well as likely co-products from second-generation feedstocks and biofuels.

⁵ The land use “credit” associated with distillers grains may actually be higher than one-third, as the literature suggests 1 lb. of distillers grains replaces more than 1 lb. of traditional feed ingredients (corn and soybean meal) in most animal rations. See Arora et al. (2008).

VI. WHILE THE EPA REPORT ADDRESSES UNCERTAINTIES AND UNKNOWNNS, THE MAGNITUDE OF UNCERTAINTY IS NOT ADEQUATELY DISCUSSED OR PROPERLY QUANTIFIED.

The draft EPA report includes some discussion of the uncertainties and unknowns associated with the environmental impacts of specific feedstocks, but the report generally fails to characterize or quantify the magnitude of uncertainty surrounding the assessments. Significant gaps in knowledge, a lack of data, and the absence of validated analytical tools contribute to the high level of uncertainty associated with biofuels environmental analysis. It is important that the final EPA report properly characterize the high degree of uncertainty associated with the analysis so that policymakers and other readers of the report can place its conclusions in proper context. As pointed out in a recent paper published in *Environmental Science & Technology* (McKone et al., 2011), the challenges for biofuels lifecycle analysis are immense. According to the paper:

Decision makers who work in real time and often cannot wait for precise results must recognize that LCA can provide valuable insight but it is not necessarily a “truth-generating machine.” Effective LCA can guide and inform decisions, but it cannot replace the wisdom, balance, and responsibility exhibited by effective decision-makers.

Not until the draft triennial report’s conclusion section do the EPA authors suggest that, “A variety of factors make it difficult to draw conclusions about the potential environmental and resource conservation impacts of the increased biofuel production and use mandated by the Energy Independence and Security Act.” The final EPA report should include clear and thorough discussion *early in the paper* (e.g., introduction or background section) regarding the inherent uncertainty related to performing this lifecycle environmental impacts analysis. Further, the authors of the final report should openly warn readers that their conclusions must be interpreted with caution, given the high degree of uncertainty and the extent of the knowledge gaps. Ideally, EPA would attempt to quantify the uncertainty associated with each of the environmental factors analyzed for the report.

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RFA appreciates the opportunity to comment on this important matter and we trust EPA will consider our comments as the agency prepares its final report to Congress. In the future, we look forward to working with EPA to ensure assessments of the environmental impacts of biofuels are conducted in a scientifically sound, fair and transparent manner.

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