THE LAW OF ALGAE
—The Renewable Fuel Standard and Application—

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I. Background. On May 5, 2009, the Administrator of the Environmental Protection Agency (the "EPA") released proposed rules based on changes that the Energy Independence and Security Act of 2007 ("EISA") made to the Renewable Fuel Standard ("RFS"). These proposed rules establish a new regulatory scheme ("RFS 2") for renewable fuels under the Clean Air Act (the "CAA"). Upon the printing of the rules in the Federal Register (which occurred on May 26, 2009), a 60-day public comment period commenced, which has now been extended to September 25, 2009. During this period, the EPA is gathering comments in writing and holding related public hearings and workshops. After the period has ended, the EPA will revise the proposed rules and publish a final version. It is noteworthy that this Notice of Proposed Rulemaking (the "NPRM") introduces an unusual level of regulatory uncertainty in that the EPA has left multiple issues unresolved either by proposing alternative versions of provisions or by explicitly leaving unresolved issues open for public comment. This chapter was drafted during the period of the public rulemaking. As such, there remain substantial unresolved regulatory issues that will have significant impact on the algae biofuels industry. Given this context, this chapter provides an analysis of the proposed regulations as presently drafted and indicates key areas of controversy that may yield changes to the rules and impact the algae biofuels industry.

While the EPA has proposed to leave significant portions of the existing RFS regulatory system ("RFS 1") in place, the proposed RFS 2 rules represent a major overhaul of the current program. Whatever changes are made as a result of the public comment period, the impact of the final version of the RFS 2 rules will be quite substantial on the biofuels industry. In many respects, the proposed rules are interrelated such that the new framework established by the RFS 2 program must be examined as a whole to effectively analyze the cost impacts and regulatory issues that are of primary importance to the algae biofuels industry: the fuel categories, the methodology used to calculate lifecycle greenhouse gas ("GHG") emissions, the factors impacting the value of Renewable Identification Numbers ("RINs"), and the extent of obligations imposed on the algae biofuels industry under the new program. RINs are the unique numbers assigned to qualifying renewable fuel under the program and are used to show compliance by obligated parties.

II. RFS 2 Program Overview, Scope, and Implementation Dates.

A. Integration of RFS 1 and RFS 2. RFS 1 was adopted by the EPA to implement the provisions of the Energy Policy Act of 2005 ("EPAct"), which added section 211(o) to the CAA. With the passage of EISA, Congress made several important revisions to these renewable fuel requirements. In the NPRM, the EPA released proposed changes to the RFS program regulations to implement these EISA provisions. The proposed changes would apply starting January 1, 2010 unless the EPA modifies its proposal on the effective date. For the remainder of 2009, the current RFS 1 regulations would apply. EPA, NPRM, 40 C.F.R. pt. 80, RIN 2060-A081, at 15 (issued May 5, 2009) (referring to pagination of PDF file originally released by EPA).

B. Separate Volume Mandates for Renewable Fuel Categories. Unlike RFS 1, EISA specifies four separate categories of renewable fuels, each with a separate volume mandate. The categories are Renewable Fuel, Advanced Biofuel, Biomass-Based Diesel, and Cellulosic Biofuel. Throughout this chapter, these terms will be capitalized when referring explicitly to the categories that have been defined by the EPA in this rulemaking. When uncapitalized, these terms have their common meaning.

As mandated by EISA, the rules establish the framework for the expansion of biofuels as a transportation fuel over the next 13 years. There is a substantial and rapid increase in the mandate for cellulosic biofuels in particular. EISA increased the Cellulosic Biofuel mandate from 250 million gallons in EPAct to 1.0 billion gallons by 2013, with additional yearly increases to 16 billion gallons by 2022. The following table details the requirements for the various categories. NPRM at 20.

Table II.A.1-1
Renewable Fuel Volume Requirements for RFS 2 (billion gallons)

	Cellulosic Biofuel requirement	Biomass-Based Diesel requirement	Advanced Biofuel requirement	Total Renewable Fuel requirement
2009	n/a	0.5	0.6	11.1
2010	0.1	0.65	0.95	12.95
2011	0.25	0.80	1.35	13.95
2012	0.5	1.0	2.0	15.2
2013	1.0	a	2.75	16.55
2014	1.75	a	3.75	18.15
2015	3.0	a	5.5	20.5
2016	4.25	a	7.25	22.25
2017	5.5	a	9.0	24.0
2018	7.0	a	11.0	26.0
2019	8.5	a	13.0	28.0
2020	10.5	a	15.0	30.0
2021	13.5	a	18.0	33.0
2022	16.0	a	21.0	36.0
2023+	b	b	b	b

a To be determined by EPA through a future rulemaking, but no less than 1.0 billion gallons.
b To be determined by EPA through a future rulemaking.

C. Fuel-Specific Analysis of GHG Emission Profiles. Perhaps the most substantial new development in RFS 2 is the EPA's attempt to quantify lifecycle GHG emission reductions of renewable fuels compared to a petroleum fuel baseline. The EPA notes that this is the first time it has undertaken such a program. It states the following approach to this issue:

> The lifecycle GHG emissions means the aggregate quantity of GHGs related to the full fuel cycle, including all stages of fuel and feedstock production and distribution, from feedstock generation and extraction through distribution and delivery and use of the finished fuel. EISA established specific greenhouse gas emission thresholds for each of four types of renewable fuels, requiring a percentage improvement compared to a baseline of the gasoline and diesel used in 2005. EPA must conduct a lifecycle analysis to determine whether or not renewable fuels produced under varying conditions will meet the greenhouse gas (GHG) thresholds for the different fuel types for which EISA establishes mandates . . . . As mandated by EISA, the greenhouse gas emission assessments must evaluate the full lifecycle emission impacts of fuel production including both direct and indirect emissions, including significant emissions from land use changes.

NPRM at 16.

The EPA's regulatory role on these issues requires it to integrate scientific and technical analysis into its categorizations of fuels. Because a lifecycle analysis necessarily encompasses all GHG emissions released and trapped from a wide range of activities in the production and use of a specific fuel, achieving a precise lifecycle GHG analysis for even one fuel is currently impossible, as no scientific consensus has yet emerged regarding methodology. The undertaking becomes even more difficult when magnified across multiple feedstocks, production techniques, and fuels. Thus the EPA has been required under RFS 2 to develop its own methodology that it can first defend scientifically and legally, and then implement and enforce. Given the breadth and novelty of the program, it is to be anticipated that the program will undergo some significant changes after the EPA has received public comment.

D. The Requirement of Renewable Biomass. The other novel and substantial change imposed by RFS 2 is the requirement that renewable fuels must be produced through the use of renewable biomass. EISA contains a host of definitions and distinctions pertaining to what qualifies as a renewable biomass. This is a substantial area of controversy currently. To the benefit of the algae biofuels industry, algae is explicitly defined as renewable biomass.

III. Renewable Fuel RIN Categories and Factors Impacting Value of RINs. EISA created new categories and requirements of renewable biofuels. The NPRM establishes a regulatory system to enforce EISA's requirements. As under RFS 1, RINs will be the tool of compliance for obligated parties who are subject to the mandates. Unlike RFS 1, there will be four different categories of RINs. These RIN categories are not completely distinct, however, with significant overlap between the categories and some fuels qualifying for multiple categories. To assess the value of RINs under the new system, it is necessary to examine the interaction between the various categories as well as the new approaches to allowances and equivalence values that the EPA has proposed. This examination will be focused on the factors most likely to impact the RIN value of fuel produced from algae.

A. Renewable Fuel. Renewable fuel was the basis for all RINs under RFS 1 and was defined generally as "any motor vehicle fuel that is used to replace or reduce the quantity of fossil fuel present in a fuel mixture used to fuel a motor vehicle." Renewable Fuel remains the broadest category under RFS 2 and would encompass all subcategories of fuel under the regulation. The definition of "Renewable Fuel" has changed substantially to the following:

Renewable fuel means a fuel which meets all of the following:

1. Fuel that is produced from renewable biomass.

2. Fuel that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel, home heating oil, or jet fuel.

3. Ethanol covered by this definition shall be denatured as required and defined in 27 CRF parts 19 through 21. Any volume of denaturant added to the undenatured ethanol by a producer or importer in excess of 5 volume percent shall not be included in the volume of ethanol for purposes of determining compliance with the requirements under this subpart.

NPRM at 480.

The change included in subpart (2) of the definition reflects the expansion of RFS to encompass home heating oil, jet fuel, locomotive fuel, and other fuels beyond the previous motor vehicle fuel limitation. The renewable

biomass requirement in (1) is imposed on the subcategories of renewable fuels as well. As will be discussed later, the renewable biomass requirement will have different significance in different contexts depending on the GHG reductions required.

The Renewable Fuel category may best be described as the lowest rung, catch-all category. Obligated parties will be required to meet their specified RIN obligations in the various specific categories and will be able to utilize excess RINs from those categories to satisfy the Renewable Fuel category. Depending on whether there is a substantial premium value to these specific category RINs, obligated parties may use them to satisfy their Renewable Fuel category obligations or sell them on the market where they could also acquire RINs to cover their deficit. It is to be expected that some market participants will utilize these higher value RINs to satisfy their Renewable Fuel obligations as a matter of convenience but only to the extent they have relatively few surplus higher value RINs.

B. Biomass-Based Diesel. "Biomass-Based Diesel" is defined as a Renewable Fuel that is either biodiesel as defined by ASTM D6751-07 or a non-ester renewable diesel. Renewable fuel that is coprocessed with fossil fuel is expressly defined as not Biomass-Based Diesel. To qualify for the Biomass-Based Diesel designation, biodiesel must qualify for a D code of 2. The cross-referenced section is a chart that provides the approved pathways for renewable fuel production. The pathway variables are the feedstock utilized and the production process requirements. The chart for biodiesel has two distinct pathways; both utilize transesterification as the production process, but the feedstock is distinguished between "soybean oil and other virgin plant oils" in one pathway and "waste grease, waste oils, tallow, chicken fat, or non-food grade corn oil" in the other. Only the nonvirgin oil pathway qualifies with a D code of 2, thus any soy or other vegetable oil biodiesel does not qualify under the definition. Notably, non-ester renewable diesel is not required to achieve a D code of 2 to be qualified as Biomass-Based Diesel. Since there are no algae biofuels in commercial production at this time, algae biofuel has not been assessed or assigned a fuel pathway by EPA. This is one of the two high-value categories where algae biofuel is most likely to qualify as a compliance fuel.

The lifecycle GHG threshold specified for Biomass-Based Diesel under EISA is a 50 percent reduction. The EPA is authorized to adjust these performance thresholds downward by as much as 10 percent but has not indicated an intention to reduce this threshold down for this category of fuel.

C. Advanced Biofuel. Advanced Biofuel "means renewable fuel, other than ethanol derived from cornstarch, that qualifies for a D code of 3 pursuant to §80.1426(d)." Except for the express exclusion of cornstarch feedstock (which exclusion is established by EISA), Advanced Biofuel may be regarded as the most flexible of the subcategory Renewable Fuels. The D code of 3 establishes that the EPA has found that the particular fuel pathway meets the RFS 2 GHG performance requirements sufficiently to warrant categorization as an "Advanced Biofuel." In effect, the EPA has defined these fuels based on GHG performance criteria and is utilizing the D codes as an approval code to signify qualification. As previously mentioned, algae biofuel has not been assessed or assigned a fuel pathway by EPA. This is the second of the two high-value categories where algae biofuel is most likely to qualify as a compliance fuel.

The lifecycle GHG threshold specified for Advanced Biofuels under EISA is a 50 percent reduction. The EPA is authorized to adjust these performance thresholds downward by as much as 10 percent. The EPA has proposed that the GHG threshold be reduced for Advanced Biofuels (and D code 2) to 44 percent or perhaps as low as 40 percent. This reduction is intended to enable to qualify the ethanol fuel pathway that utilizes sugarcane to achieve compliance. NPRM at 24.

D. Cellulosic Biofuel. Cellulosic Biofuel "means renewable fuel derived from any cellulose, hemi-cellulose, or lignin that is derived from renewable biomass and that qualifies for a D code of 1 pursuant to §80.1426(d)." Thus, unlike Advanced Biofuel, Cellulosic Biofuel must originate from referenced cellulosic feedstocks. It also must qualify for a D code of 1, which corresponds to the most rigorous GHG emissions performance of a 60 percent reduction. The EPA has not indicated an intention to reduce this threshold. Because of the cellulosic content requirement, it is not anticipated that algae biofuel will qualify for this category.

E. Relationship Between Categories. Under the proposed system, any fuel that meets the requirements for Cellulosic Biofuel or Biomass-Based Diesel will fulfill the requirements for Advanced Biofuels. Similarly, any renewable fuel that meets the requirement for Advanced Biofuels is also valid for meeting the Renewable Fuel requirements. NPRM at 21. This is best illustrated by examining the requirements of a particular year. In 2010, EISA requires 100 million gallons of Cellulosic Biofuel, 650 million gallons of Biomass-Based Diesel, 950 million gallons of Advanced Biofuel, and a total Renewable Fuel requirement of 12,950 million gallons of qualifying fuel. If one assumes for illustration that no more Cellulosic Biofuel or Biomass-Based Diesel will be produced than is necessary for compliance, the breakdown will be as follows: 100 million gallons of Cellulosic Biofuel (D Code 1), 650 million gallons of Biomass-Based Diesel (D Code 2), 200 million gallons of Advanced Biofuel (D Code 3), and 12 billion gallons of Renewable Fuel (D Code 4).

To further illustrate how the system will work in practice, it is useful to consider several specific fuel pathways under consideration. Under the NPRM, the EPA has found that the soy biodiesel pathway is insufficient to meet the requirements for the fuel to qualify as a Biomass-Based Diesel (which was the category that it was previously assumed would include soy biodiesel). The soy biodiesel would next be considered for the possibility of qualifying for D Code 3 and being classified as Advanced Biofuel. If it met this criterion, then it could be used for Advanced Biofuel compliance but not Biomass-Based Diesel compliance. A review of Table 1 to section 80.1426 reveals that the soy biodiesel falls short of the Advanced Biofuel criteria, as it has a D code 4, which means it may only be utilized for Renewable Fuel compliance. Ethanol made from sugarcane sugar with process heat derived from sugarcane bagasse, on the other hand, is shown on the table as qualifying with a D code 3. As previously noted, this qualification is based on the EPA loosening the requirements for the Advanced Biofuel category from 50 percent GHG reduction to 44 or 40 percent.

F. Equivalence Value of Fuels. Under RFS 1, RIN values were assigned to qualifying fuels based on their energy value in comparison with ethanol. In addition, the EPA was empowered to establish "appropriate" credit for certain fuels, including cellulosic and waste-derived fuels. Under the resulting RFS 1 system, on a per-gallon basis corn ethanol received a value of 1.0, butanol 1.3, biodiesel 1.5, non-ester renewable diesel 1.7, and cellulosic biomass ethanol and waste-derived ethanol 2.5. Thus two gallons of cellulosic biomass ethanol would generate 5.0 RINs.

Under RFS 2, the EPA has proposed substantial changes to the equivalence value system. However, the NPRM states, "Overall EPA believes that the statute continues to be ambiguous on this issue, and we are therefore co-proposing and seeking comment on two options for Equivalence values." The listed options are as follows:

1. Equivalence Values would be based on the energy content and renewable content of each renewable fuel in comparison to denatured ethanol.

2. All liquid renewable fuels would be counted strictly on the basis of their measured volumes, and the Equivalence Values for all renewable fuels would be 1.0 (essentially, Equivalence Values would no longer apply).

The EPA proposes to use 77,930 Btu/gal. as the energy content of denatured ethanol, which is slightly different than the previous value of 77,750 Btu/gal. Under option 1, the EPA would utilize an ethanol-equivalent energy content approach based strictly on energy content. The prior multiplier factor of 2.5 for cellulosic ethanol would not be utilized. Instead, all ethanol would be equivalent for volume purposes. However, fuels with higher energy content per gallon, such as diesel fuel, would receive proportionately greater RINs.

Thus cellulosic diesel fuel would generate RINs at a multiplier factor of 1.7 compared with cellulosic ethanol. To the extent that diesel fuels comply with either the Cellulosic Biofuel or Advanced Biofuel category requirements, this option would have a significant impact. The NPRM states that this approach will not be utilized for Biomass-Based Diesel, as Congress intended a straight volume approach in this category and therefore the agency will utilize a 1:1 volume approach in this category. NPRM at 99-100.

Alternatively, if the EPA opts to follow option 2, equivalence values would be eliminated for all fuels and the relationship would be 1:1 for RIN values for all fuels.

IV. Renewable Biomass Mandate. One of the most dramatic changes to the RFS under RFS 2 is the requirement that all qualifying renewable fuels be produced with "renewable biomass." Renewable biomass is defined as follows.

Renewable biomass means each of the following:

1. Planted crops and crop residue harvested from existing agricultural land.

2. Planted trees and slash from a tree plantation located on non-federal land (including land belonging to an Indian tribe or an Indian individual that is held in trust by the U.S. or subject to a restriction against alienation imposed by the U.S.) that was cleared at any time prior to December 19, 2007, and has been continuously actively managed since December 19, 2007. Active management is evidenced by any of the following:

   a. Records of sales of planted trees or slash, or records of purchases of seeds, seedlings, or other nursery stock.

   b. A written management plan for silvicultural purposes.

   c. Documented participation in a silvicultural program administered by a Federal, state, or local government agency.

   d. Documented management in accordance with a certification program for silvicultural products.

3. Animal waste material and animal byproducts.

4. Slash and pre-commercial thinnings from non-federal forestland (including forestland belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States) that is not ecologically sensitive forestland.

5. Biomass (organic matter that is available on a renewable or recurring basis) obtained from within 200 feet of buildings, campgrounds, and other areas regularly occupied by people, or of public infrastructure, such as utility corridors, bridges, and roadways, in areas at risk of wildfire.

6. Algae.

7. Separated yard waste or food waste, including recycled cooking and trap grease.

42 U.S.C. § 80.1401.

V. GHG Emission Analysis and Fuel Pathways.

A. Overview of GHG Requirements. Given that the lifecycle GHG emissions represent the most significant determinant of the various categories, the EPA's approach to GHG analysis is central to understanding the proposed system. The EPA provides detailed information regarding its approach to this analysis. Overall, biofuel is assessed based on the feedstock and the production technology utilized. For instance, ethanol produced from cornstarch using the same production technology receives the same GHG lifecycle assessment regardless of where the corn was grown or at what facility the fuel was produced.

The EPA's analysis includes direct and "significant indirect" emissions. Direct emissions are classified as those that are emitted from each stage of the full fuel lifecycle, including the growing of the feedstock, the distribution of the feedstock, the production of the fuel, the distribution of the fuel, and the use of the fuel in a transportation application. Indirect emissions include other emissions impacts that result from fuel production or use, such as shifts in acreage between different crop types or land uses. Indirect land use changes include changes in the usage of land, such as from forest to crop use. NPRM at 275. The EPA asserts that it is legally required to include the international indirect emissions that it determines are significant. NPRM at 276.

B. Fuel Pathways. The GHG lifecycle analysis provides the basis for determining the feedstock, production technologies, and fuels that qualify for the various RFS 2 categories. The EPA refers to these combinations as "fuel pathways." For each of the four categories of renewable fuel, the specific requirements imposed by EISA establish additional requirements for qualification.

In the category of Cellulosic Biofuel, the EPA has determined that cellulosic ethanol produced through an enzymatic hydrolysis process followed by fermentation using any eligible waste cellulosic feedstock will meet the 60 percent GHG threshold for Cellulosic Biofuel. The EPA utilized switchgrass to arrive at this determination. It invites comment as to whether this pathway should also include the feedstocks of miscanthus and planted trees. Utilizing this methodology, the EPA developed the following fuel pathway chart that establishes which fuels will qualify for the various RFS 2 categories. This same methodology will likely be utilized to determine whether biofuels produced from algae meet the specific category requirements.

Applicable Categories for Each Fuel

Pathway fuel type	Feedstock	Production process requirements	Category
Ethanol	Starch from corn, wheat, barley, oats, rice, or sorghum	- Process heat derived from biomass	Renewable Fuel
Ethanol	Starch from corn, wheat, barley, oats, rice, or sorghum	- Dry mill plant - Process heat derived from natural gas - Combined heat and power (CHP) - Fractionation of feedstocks - Some or all distillers grains are dried	Renewable Fuel
Ethanol	Starch from corn, wheat, barley, oats, rice, or sorghum	- Dry mill plant - Process heat derived from natural gas - All distillers grains are wet	Renewable Fuel
Ethanol	Starch from corn, wheat, barley, oats, rice, or sorghum	- Dry mill plant - Process heat derived from coal - Combined heat and power (CHP) - Fractionation of feedstocks - Membrane separation of ethanol - Raw starch hydrolysis - Some or all distillers grains are dried	Renewable Fuel
Ethanol	Starch from corn, wheat, barley, oats, rice, or sorghum	- Dry mill plant - Process heat derived from coal - Combined heat and power (CHP) - Fractionation of feedstocks - Membrane separation of ethanol - All distillers grains are wet	Renewable Fuel
Ethanol	Cellulose and hemicellulose from corn stover, switchgrass, miscanthus, wheat straw, rice straw, sugarcane bagasse, forest waste, yard waste, or planted trees	- Enzymatic hydrolysis of cellulose - Fermentation of sugars - Process heat derived from lignin	Cellulosic Biofuel
Ethanol	Cellulose and hemicellulose from corn stover, switchgrass, miscanthus, wheat straw, rice straw, sugarcane bagasse, forest waste, yard waste, or planted trees	- Thermochemical gasification of biomass - Fischer-Tropsch process	Cellulosic Biofuel
Ethanol	Sugarcane sugar	- Process heat derived from sugarcane bagasse	Advanced Biofuel
Biodiesel (mono alkyl ester)	Waste grease, waste oils, tallow, chicken fat, nonfood grade corn oil	- Transesterification	Biomass-Based Diesel
Biodiesel (mono alkyl ester)	Soybean oil and other virgin plant oils	- Transesterification	Renewable Fuel

Pathway fuel type	Feedstock	Production process requirements	Category
Cellulosic diesel	Cellulose and hemicellulose from corn stover, switchgrass, miscanthus, wheat straw, rice straw, sugarcane bagasse, forest waste, yard waste, or planted trees	- Thermochemical gasification of biomass - Fischer-Tropsch process - Catalytic depolymerization	Cellulosic Biofuel or Biomass-Based Diesel
Non-ester renewable diesel	Waste grease, waste oils, tallow, chicken fat, or corn oil	- Hydrotreating - Dedicated facility that processes only renewable biomass	Biomass-Based Diesel
Non-ester renewable diesel	Waste grease, waste oils, tallow, chicken fat, or nonfood grade corn oil	- Hydrotreating - Coprocessing facility that also processes petroleum feedstocks	Advanced Biofuel
Non-ester renewable diesel	Soybean oil and other virgin plant oils	- Hydrotreating	Renewable Fuel
Cellulosic gasoline	Cellulose and hemicellulose from corn stover, switchgrass, miscanthus, wheat straw, rice straw, sugarcane bagasse, forest waste, yard waste, or planted trees	- Thermochemical gasification of biomass - Fischer-Tropsch process - Catalytic depolymerization	Cellulosic Biofuel

For fuels that have not yet been assigned a pathway, the EPA proposes a regulatory mechanism whereby a producer can temporarily assign its renewable fuel to a category if it meets certain requirements. This is referred to as utilizing default D codes. The producer would utilize the D code that best represents its combination of fuel type, feedstock, and production process.

VI. Key Additional Provisions and Issues.

A. Registration Process for Producers and Importers. The EPA is proposing a revision of the registration process for renewable fuel producers and importers. The proposed measures will require producers to provide information on their feedstocks, facilities, and products. The EPA has developed the comprehensive proposed set of requirements in the document entitled "Proposed Information Collection Request."

It is also notable that the EPA intends to collect RIN price information for transactions involving both separated RINs and RINs assigned to a renewable volume. The EPA states that this information will be of programmatic value to enable the EPA to anticipate and react to market disruptions and other compliance challenges. NPRM at 154.

B. Penalties. The prohibition and liability provisions of RFS 2 are similar to those of RFS 1. The proposed rule identifies prohibited acts, including failure to acquire sufficient RINs to meet a party's obligations, producing or importing a renewable fuel that is not assigned a proper RIN category, improperly assigning RINs to renewable fuel that was not produced with renewable biomass, failing to assign RINs to qualifying fuel, or creating or transferring invalid RINs. Under the proposed rule, any person who violates any prohibition or

requirement of the RFS 2 program may be subject to civil penalties of $32,500 for every day of each violation and the amount of economic benefit or savings resulting from the violation. These provisions provide for strict liability, and there is no defense even where the willful violation occurred upstream and the downstream participant proceeded in good faith. The penalties extend to failure to comply with reporting requirements.

C. EMTS. The EPA proposes an EPA Moderated Transaction System ("EMTS"). It acknowledges that that 38-digit standardized RIN system has proved confusing to market participants. Once an error occurs with a RIN, it is often propagated throughout the system. Under the strict liability of RFS 2, all downstream parties are also in violation. EMTS would be a closed, EPA-managed system that would provide a mechanism for screening RINs and a structured environment for conducting RIN transactions. Once registration was established, individual RIN accounts would be maintained on the system for each individual party.

VII. Conclusion. These changes to the RFS will have substantial impacts on the nascent algae biofuels industry. While portions of the rules are subject to change, the explicit inclusion of algae as a renewable biomass by definition provides a substantial boost to the industry. The values of RINs from the various categories remain unknown and could be of substantial value to the algae biofuels industry, particularly if compliance is difficult and the RFS 2 is strictly enforced.