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October 8, 2009

By Electronic Mail

Clerk of the Board
California Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95812

15-Day Comments

Re: Notice of Availability of Modified Text for Proposed Regulation to Establish Low-Carbon Fuel Standards (September 23, 2009).

Dear Madam:

On behalf of POET LLC ("POET"), I am submitting this response to the Executive Officer's notice of availability of a modified text and additional materials for the Board's proposed low-carbon fuel standard ("LCFS") regulation. Currently the largest producer of ethanol in the world, and a key supplier of ethanol for the California market, POET has a vital interest in the LCFS rulemaking, and provided comments on the proposed LCFS regulation when it was first considered by the Board earlier this year.

POET produces more than 1.5 billion gallons of ethanol annually from 26 production facilities in seven States. Since its founding in 1983, POET has focused much of its resources on improving the energy efficiency of ethanol production. This has been critical to our commercial success and our ability to contribute to the nation's efforts to gain energy independence.

Today, POET and many other ethanol companies are challenged by difficult economic circumstances. We and other companies also face uncertain and sometimes conflicting environmental requirements. These conditions greatly complicate our efforts to bring ethanol produced from cellulose, which is one of POET's principal business goals, to commercial reality. California is the largest single State market for ethanol in the United States. Some aspects of the proposed LCFS regulation, and in particular the inclusion of an indirect land-use emissions penalty on corn ethanol, present the most significant obstacles to those efforts. Our efforts to advance the U.S. biofuels industry, and the threat to those efforts presented by the indirect land-use emissions penalty, were described in our comments previously submitted to the Board.

These additional comments are motivated by developments since our earlier comments on the LCFS proposal. The Executive Officer's September 23 notice indicates that he is considering the addition of a number of new pathways in the proposed "Lookup Table" for use in determining carbon intensity ("CI") values under "Method 1" in proposed section 95486 of the LCFS regulations, which have never been presented to the Board for its review and approval. POET is a member of Growth Energy, an association that includes the nation's leading ethanol manufacturers, and supports Growth Energy's objections to the procedures that the Executive Officer is using in order to include the additional pathways in proposed Lookup Table.

POET is particularly concerned about the combined impact of the new proposed pathways and the Executive Officer's proposed elimination of any time limit on the review and approval process for alternative CI values under "Method 2" in proposed section 95486. The lack of any time limit on the approval process for Method 2 is exacerbated by the vague criteria and procedures for use in Method 2, as explained Growth Energy's August 19, 2009, comments. When combined with all the additional pathways included in September round of proposed modifications to the Lookup Table and those included

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in the Executive Officer's earlier post-hearing revisions, the elimination of any time limit for action on further adjustments using Method 2 would make POET noncompetitive as an ethanol supplier for the California market.

It is not clear why the Executive Officer has decided to add or modify pathways for some production processes. We have seen no formal or informal requests for the additions of the new pathways in the public record. But it is certain that any stakeholder in the LCFS regulatory process that does not seek to have CI values added to the Lookup Table now will be consigned to an open-ended and potentially indefinite review process under Method 2 that will place it at a significant disadvantage, and that will limit the options of the energy companies that would benefit from a diversity of different compliance strategies for the LCFS regulation.

Accordingly, POET is submitting with this letter detailed information that is sufficient to support the addition of seven new pathways for corn ethanol produced from Midwest dry mills to the Lookup Table in proposed section 95486. That information includes data reported by university scientists who have studied ethanol production using raw starch hydrolysis technologies, applications of the California GREET model to new data and analysis reported by government researchers and in the peer-reviewed literature, and a description by POET's Executive Vice President for Corporate Operations on POET's application of the relevant technologies and its use of biomass as a process fuel.

The CI values supported by the accompanying information range from 44.28 grams of carbon-dioxide-equivalent emissions per megajoule ("gCO2e/MJ") to 60.94 gCO2e/MJ. Using the existing nomenclature in the Lookup Table, the specific direct-emissions CI values for the production of anhydrous ethanol would be as follows:

- 59.42 gCO2e/MJ -- Midwest, Dry Mill, Raw Starch Hydrolysis, Dry DGS, NG.
- 47.98 gCO2e/MJ -- Midwest, Dry Mill, Raw Starch Hydrolysis, Dry DGS, Biomass for Process Fuel.
- 60.94 gCO2e/MJ -- Midwest, Dry Mill, Fractionation, Dry DGS, NG.
- 47.34 gCO2e/MJ -- Midwest, Dry Mill, Fractionation, Dry DGS, Biomass for Process Fuel.
- 53.28 gCO2e/MJ -- Midwest, Dry Mill, Fractionation, Raw Starch Hydrolysis, Dry DGS, NG.
- 44.28 gCO2e/MJ -- Midwest, Dry Mill, Fractionation, Raw Starch Hydrolysis Dry DGS, Biomass for Process Fuel.
- 51.31 gCO2e/MJ -- Midwest, Dry Mill, Dry DGS, Biomass for Process Fuel

The data on which these CI values are based and the application of the CA-GREET model to the data are fully explained in two accompanying declarations.[1] We believe that the documentation that we are supplying to support these additional pathways is far more complete than the documentation that has

[1] In using the "Midwest" term in the list of CI values presented above, POET does not mean to suggest that ARB would be justified in treating Midwest facilities any differently from facilities in other portions of the nation that use the same processes or combinations of processes. POET also supports Growth Energy's prior comments that the distinction between corn ethanol production facilities in one State compared to any other State in the Lookup Table has no technical validity and is discriminatory.

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been placed in the public record by the Executive Officer to support several of the new pathways that he is proposing to add to the Lookup Table. If, however, additional information is necessary to evaluate those CI values, please ask the ARB staff to contact Erin Heupel at 605/965-2200. We invite public comment on our proposed CI values, and ask that any such comments be sent not only to ARB but to Erin Heupel, at the address shown above.

For reasons stated by Growth Energy, POET believes that it is improper for the Executive Officer to add new pathways and new CI values to the Lookup Table in the manner in which he has chosen. If the Executive Officer decides to proceed with his currently proposed modifications to the Lookup Table, it would be additionally unreasonable and contrary to law for the Executive Officer to not also add the seven pathways described above to the Lookup Table.

Thank you in advance for considering these comments, as well as those of Growth Energy, and other stakeholders in this important rulemaking effort.

Sincerely,

Mark D. Stowers

Mark D. Stowers, Ph.D.

cc: W. Thomas Jennings, Esquire

STATE OF CALIFORNIA

AIR RESOURCES BOARD

Response to Notice of Availability of Modified Text and Availability of Additional Documents Released on September 23, 2009

Declaration of Jeff Lautt

I, Jeff Lautt, declare and state as follows:

1. I submit this Declaration in support of the response by POET LLC to the Notice of Modified Text and Availability of Additional Documents published by the Executive Officer in the Low-Carbon Fuels Standard ("LCFS") rulemaking on September 23, 2009.

2. I am the Executive Vice President of Corporate Operations at POET. I am responsible for all of POET's commercial business units, including design and construction of ethanol plants, plant operations, marketing, logistics, risk management, business development, and human resources. I also serve as a board member of POET. I hold a Bachelor of Science degree in Business and Engineering from South Dakota State University.

3. My position at POET requires me to have first-hand knowledge of the technologies that POET uses to produce ethanol from corn starch and other feedstocks, as well as co-products that are commercially valuable to POET. I am also required to have first-hand knowledge of the costs, energy requirements, and greenhouse gas emissions profiles for POET's production processes. I also have an understanding of the energy markets needed by any senior executive in the U.S. ethanol industry. The information contained in this Declaration is based on my personal knowledge, and I could and would testify to the information presented here if called upon to do so.

4. POET by volume is the largest ethanol producer in the world and a leader in biorefining. POET produces more than 1.54 billion gallons of ethanol annually from 26 production facilities in seven states. POET recently commissioned a pilot-scale cellulosic ethanol plant that uses corn cobs as feedstock and is working to commercialize the process at Project LIBERTY in Emmetsburg, Iowa.

5. POET has positioned itself to utilize clean burning natural gas to power all 26 POET affiliated ethanol refineries. A major cost to POET is its thermal process energy to produce steam and energy required to dry distillers grains with soluble "DGS" into a value added co-product called Dakota Gold™ DDGS.

6. Dakota Gold™ is known for its consistent and higher than average feed values as well as its superior handling characteristics. POET's focus on quality control of co-products and continuous improvement make it imperative to track and report detailed costs associated with these co-products including the cost of energy. Each refinery is equipped with thousands of data collection points including flowmeters that allow precise and accurate accounting of co-product costs as well as monitoring quality control.

7. In its ethanol production process POET uses an enzymatic raw starch hydrolysis technology known as BPX™. BPX™ removes the conventional process step of cooking the corn grain slurry in order to convert corn starch to sugars. This not only saves energy, but also provides for a more effective saccharification that produces more ethanol from each bushel of corn. On average, BPX™ reduces energy consumption by 4,643 BTU per gallon of ethanol produced compared to conventional cook processes. When utilizing BPX™ each bushel of corn generates on average an additional .154 gallons of ethanol compared to conventional cook processes.

8. Although the cost of natural gas has fallen in the recent past, its volatility and potential for spiking in the future are factors that POET has been required to address. One solution implemented by POET is to replace natural gas with the use of biomass. POET's 100-million-gallon/year ethanol refinery located in Chancellor, South Dakota began to utilize a solid fuel boiler in September 2008. Since that time, it has been determined that all of POET Chancellor's steam needs can be derived from local wood waste fuels. POET Chancellor's DDGS driers operate on natural gas. When combined with the energy savings of BPX™, approximately 60 percent on average of the energy needs of POET Chancellor is derived from biomass. POET Chancellor's curtailment of natural gas usage reduce emissions by nearly 80,000 metric tons of carbon dioxide equivalent emissions per year. .

I hereby declare that the foregoing is true and correct to the best of my knowledge and belief.

Executed this 6 day of October 2009 at Sioux Falls, South Dakota.

Jeff Lautt

State of California
Air Resources Board

Response to Notice of Availability of Modified Text and Availability of Additional Documents Released on September 23, 2009

DECLARATION OF CHARLES R. HURBURGH, JR., Ph.D.

I, Charles R. Hurburgh, Jr., declare as follows:

1. I am a scientist with training and expertise in the study of methods of the production of ethanol from corn starch, among other fields. I am currently a Professor in the Agricultural and Biosystems Engineering Department at Iowa State University ("ISU"). My resume is attached as Exhibit A to this Declaration. One of my current and longstanding areas of research is the evaluation of grain quality characteristics, and how variations in grain quality can create opportunity within the global grain supply-chain. That research has produced over 200 technical and general articles on the subject. As Manager of the ISU Grain Quality Research Laboratory and Professor-in-charge, Iowa Extension Grain Quality Initiative, I offer the following information pertaining to ethanol industry use of enzymatic based raw starch hydrolysis of corn grain. The information presented here is based on my personal knowledge, and the opinions are based on my training and expertise. I could and would testify before a tribunal according to the facts and opinions presented in this Declaration.

2. As part of a research project to determine if ethanol yield from corn can be estimated from readily measureable parameters of the whole corn, laboratory fermentation by the widely used jet-cook (liquefaction) process was compared to laboratory fermentation using an enzymatic raw starch hydrolysis (cold) fermentation process. The jet-cook process was done in the laboratory of the Illinois Crop Improvement Association; the enzymatic hydrolysis process was done in the laboratory of Dr. Jay-Lin Jane at ISU. A wide diversity of corn samples was

used, from high protein to low, and from very hard to soft. Table 1 (below) shows the jet cook results on the 25 comparison samples. In my professional opinion, the average ethanol yield increases in these laboratory studies support the contention that process improvements can improve ethanol yields with less input energy.

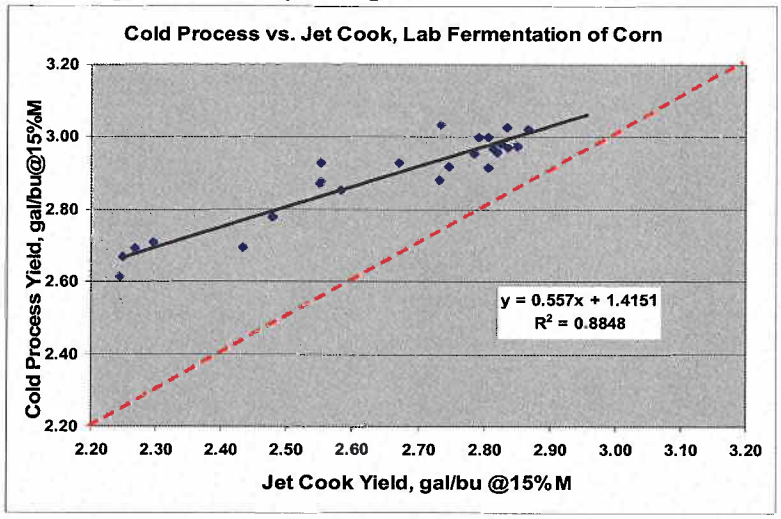
Table 1. Properties of the 25 samples used to compare fermentation methods.

	Protein	Oil	Starch	Density	Ethanol Yield*
	% @15%M	% @15%M	% @15%M	g/cc @15%M	gal/bu@15%M
Average	8.38	3.81	59.61	1.273	2.72
High	12.3	8.2	65.4	1.328	2.96
Low	5.0	2.6	49.4	1.185	2.24
StdDev	1.18	0.78	2.52	0.023	0.105

*Jet-cook yield.

3. Figure 1 shows the comparison of the jet cook and enzymatic processes, on these samples. The enzymatic process always yielded more ethanol per bushel, with less cooking (less energy). Although energy saving quantification was not part of this research, less cooking automatically means less energy input. Samples that were more difficult to ferment (lower yields in jet cook) gave relatively higher advantage to enzymatic hydrolysis.

Figure 1. Higher ethanol yields per bushel of corn from the cold fermentation process.



4. The regression of the data points in Figure 1 leads to estimates of potential increase in ethanol production from the enzymatic process. These are shown in Table 2 (below). On average corn (the two highlighted lines in Table 2), the enzymatic hydrolysis laboratory process yielded 0.2 gal/bu more ethanol, a 7.3% increase over the jet cook process.

Table 2. Estimated increase in enzymatic hydrolysis yield from corn samples with increasing jet cook yield.

Jet Cook gal/bu@15%M	Enzymatic gal/bu@15%M	Difference gal/bu@15%M	Enyzmatic Hydroysis Gain %
2.20	2.65	0.45	20.2%
2.30	2.70	0.40	17.4%
2.40	2.76	0.36	14.9%
2.50	2.81	0.31	12.5%
2.60	2.87	0.27	10.3%
2.70*	2.92	0.22	8.3%
2.80*	2.98	0.18	6.4%
2.90	3.04	0.14	4.7%
3.00	3.09	0.09	3.0%

*Typical jet-cook process industry yield reports.

I declare under penalty of perjury under the laws of the State of California that the foregoing is a true and correct representation of my professional opinion.

Executed this 6th day of October, 2009 in Ames, Iowa.

Charles R. Hurburgh

Digitally signed by Charles R. Hurburgh
DN: cn=Charles R. Hurburgh, o=Iowa State University, ou=Agricultural Engineering, email=tatry@iastate.edu, c=US
Date: 2009.10.06 15:52:24 -06'00'

Charles R. Hurburgh, Jr., Ph.D.

CONDENSED VITA

Charles R. Hurburgh, Jr.
Professor
Agricultural and Biosystems Engineering Department
Department of Food Science and Human Nutrition (Courtesy)
Iowa State University

EDUCATION

College and University

- Wabash College, Crawfordsville, Indiana, a liberal arts college. 1967-1969.
- B.S., Agricultural Engineering, Iowa State University, Power and Machinery specialization. Graduated February 1973.

Graduate Education

- M.S., Agricultural Engineering, Iowa State University. Graduated February 1980.
- Ph.D., Agricultural Engineering-Economics minor, Iowa State University. Graduated December 1981.

PROFESSIONAL RECORD

May 1972-March 1976	Managed and operated cash grain farm, 1000 acres corn and soybeans at Rockwell City, IA. Still owned and share rented.
Sept. 1976-May 1978	Instructor, Iowa State University, Agricultural Engineering Department Courses taught – farm management and equipment selection, agricultural hydraulics, farm electrification, grain handling and storage.
May 1978-June 1982	Instructor, research and teaching, Iowa State University, Agricultural Engineering Department
July 1982-June 1985	Assistant Professor, Iowa State University
July 1985-June 1991	Associate Professor, Iowa State University
July 1991-present	Professor, Iowa State University Current appointment: Extension (30%) and Research (70%)
July 1998-present	Professor-in-Charge, Iowa Grain Quality Initiative

Current research and extension interests

Grain quality, marketing and distribution; value-added to grain through quality specification and traceability. Physical and chemical properties of biological materials, chemical and electronic instrumentation, near-infrared reflectance analysis, chemometrics, metrology, statistics of very large databases.

Public and private policy development-biotechnology policy, international Standards, marketing incentives, and supply organizations. Country grain elevator management practices. Quality management systems and ISO. Food system traceability.

Professional Societies

American Society of Agricultural Engineers (ASAE)
American Society of Cereal Chemists (AACC)
Iowa Academy of Science (IAS)
Grain Elevator and Processing Society (GEAPS)
American Oil Chemists Society (AOCS)
Society for Applied Spectroscopy (SAS)
International Diffuse Reflectance Council (IRDC)
Council on NIR Spectroscopy (CNIRS)

Technical Committees

GEAPS grades and weights committee (1986-present)
GEAPS educational program committee (1986-1988; 1999-present)
National Grain and Feed Association Grain Quality Workshops (1986-present); Chair (1991-1992)
National Institute of Standards and Technology grain measurement type approval task sectors (1992-present)
Iowa Extension Grain Quality Initiative (1995-present); Professor-in-Charge (1998-present)
AACC NIR methods committee (1997-present) Chair (2000 – present)
AACC Biotechnology methods committee (2000-present)
US ISO Technical Advisory Group for TC 34 (Agriculture) WG7, biotechnology testing and WG12 traceability (2001- present)
Council on Near Infrared Spectroscopy Associate Editor (2003 – present)
ISO 22006 agricultural standards, ISO Technical Committee TC34, working group 12, US expert group chair (2004 – present)
KEMA Registrars, Inc. Corporate Advisory Committee 2004 –
European Union Study Committee Trace (traceability of foods) 2005-
European Union Study Committee CoExtra (GMO markets) 2005 -
Germplasm Enhancement of Maize Advisory Committee 2006 –

Honors and Awards

GEAPS, Industry Leader Award (2002)
Andersen Research Award (2000)
Pro Farmer Man of the Year – Iowa (1998)
Author of 200 technical and general articles on grain quality. Manager of the ISU Grain Quality Research Laboratory – 15 employees, approximately $500,000 annual program. Professor-in-charge, Iowa Extension Grain Quality Initiative – 3 employees, approximately $350,000 annual extension outreach program.

Recent Publications

Hurburgh, C. R., Jr. 2007. Measurement of fatty acids in whole soybeans with near infrared spectroscopy. Lipid Technology 19(4): 450. April 2007.

Igne, B., L. Gibson, G. Rippke and C. Hurburgh. 2007. Triticale Moisture and Protein Measurement by Near Infrared Spectroscopy. Cereal Chemistry 84:239-241

Kovalenko, I, G. R. Rippke, and C. R. Hurburgh, Jr. 2007. Dimensionality reduction of near infrared spectral data using global and local implementations of principal component analysis for neural network calibrations. JNIRS 15:21-28.

Gerde, J., Connie L. Hardy, Charles R., Hurburgh, Jr. and Pamela White. 2007. Rapid determination of degradation in frying oils by near-infrared spectroscopy. JAOCS 84:519-522

Thakur, M. and C. R. Hurburgh, Jr. 2007. Quality of U.S. Soybean Meal compared to the Quality of Soybean Meal from other Origins. JAOCS 84:835-843.

Esteve-Agelet, L., Charles R. Hurburgh, Feng Mao, James J. Gaunt, and Say Kee Ong. 2007. Permeation Studies of PVC Pipes with Near Infrared Spectroscopy (NIRS). JNIRS 15:283–289

Igne, B., L. Gibson, G. Rippke and C. Hurburgh. 2007. Influence of yearly variability of agricultural products on the NIRS calibration process: a triticale example. Cereal Chemistry 84(6):576-581)

Hurburgh, C. R., Jr., Elvira Fernandez d'Ahumada and G.R. Rippke. 2008. Chemometrics Issues in Calibrating an On-Harvester Embedded NIR Sensor. Chemometrics in Analytical Chemistry, Montpellier, France. June 30-July 4, 2008. Invited presentation, published abstract.

Laux, C. A, C.R. Hurburgh, Jr., G.A. Mosher. 2008. Food Traceability Using Quality Management Systems to Meet the Food and Drug Administration Bioterrorism Act of 2002. Accepted for presentation at the National Association of Industrial Technologists Annual Conference, Nashville, TN (November 14, 2008).
Outstanding Paper selection, First out of 273 contributions.

Igne B., Rippke G.R., Hurburgh C.R., 2008. Measurement of Whole Soybean Fatty Acids by Near Infrared Spectroscopy, Journal of the American Oil Chemists' Society, 85(12):1105-1113.

IGNE B., and C.R. Hurburgh, Jr. 2008. Standardization of Near Infrared Spectrometers: Evaluation of common techniques for intra and inter brand calibration transfer. JNIRS 16:539-550.

Maitri Thakur, Gretchen A. Mosher, Brittini Brown, Gregory S. Bennet, Howard E.Shepherd, Charles R. Hurburgh, 2009. Traceability in the bulk grain supply chains. Resource: Engineering and Technology for a Sustainable World, American Society of Agricultural and Biological Engineers, April/May 2009:20-22.

Maitri Thakur and Charles R. Hurburgh, 2009. "Framework for implementing traceability system in the bulk grain supply chain", Journal of Food Engineering (acc)