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November 16, 2010

Joint Committee on Greener Chemicals and Processes  
NSF International

**Re: NSF/GCI 355 Greener Chemicals and Processes Information**

Citizens' Environmental Coalition is a statewide coalition of environmental organizations and individuals. We appreciate the opportunity to comment on this standard.

**1.1 Purpose**

We agree with the purpose - to have a standardized way to define and report the primary categories of information, their respective data elements and data quality objectives. We also agree with clear communication, transparency and consistency that helps business customers evaluate the relative greenness of a chemical product and the process over its life cycle. We appreciate the goal for the supplier and the customer to each reduce the environmental footprint of the chemical product and process in a socially responsible manner.

The title of this standard is **Greener Chemicals and Processes Information**. We appreciate that the writers of this standard have given high priority to the very important issue of information and transparency. However, little about this standard sets as a goal greener or safer chemicals and processes, especially as it relates to toxicity and hazard characteristics. This stands in stark contrast to the standard's notable attention to energy use and efficiency. We expected to read a standard that was primarily about manufacturers moving to safer chemicals and processes, reducing toxicity and process safety hazards, reducing or eliminating the discharge to the environment of chemical by-products or wastes. Instead we see a standard which calls for improved reporting and disclosure on chemical hazards about a manufacturer's existing chemicals and processes, while asking for a lot of information about energy and water use.

There are no definitions of a greener chemical and greener chemical process. Although in Section 6.2 we have a description of a greener chemical process. "A greener chemical process better maximizes the conversion of chemical inputs and reuse of auxiliary chemicals to manufacture a unit of chemical product, and thus reduces waste generation and depletion of

natural resources." So here a greener chemical process relates to more efficient use of raw materials and reduction in waste generation.

**We believe that a Greener Chemicals Standard cannot exist without a definition of a greener chemical. In addition a greener chemical should address toxicity and safety FIRST as primary issues. The same is true for a greener chemical process. Other issues- energy efficiency, water and other natural resources, and climate change are also important to address.**

**As currently written this standard allows a highly toxic and persistent, bioaccumulative chemical to be called "greener" and the process which made it to be called a "greener chemical process. " All that is required is accurate information passed on to the business customer. We believe this is the most serious failing of this standard.**

**In addition the standard as written does not provide an adequate opportunity for a manufacturer to describe how it stands out from the pack in advancing green chemistry principles, in substituting safer chemicals for more toxic ones, and going beyond regulatory compliance to voluntarily undertake pollution prevention projects.**

### **1.3 Guiding Premises**

2. Data and information reported in this standard are intended to be relevant, accurate (addition), verifiable, and obtained, where practical, using standard methods so that users can compare reports reliably. For this recommendation, see Section 4.1 Purpose where the word accurate is used.

6. **Rewritten recommendation:** Greener chemical products should be designed to reduce or eliminate negative health and environmental impacts, while preserving efficacy of function, meeting customer specifications/requirements and providing value and benefits to society.

11. This statement makes no sense. The entire purpose of greener chemicals and processes should be to provide benefits to the public at large. However, a statement referring to employees is appropriate.

**Rewritten recommendation:** Greener chemicals and processes shall not be undertaken that increase the potential for harm to employees.

### **1.4 Relationship with laws and regulations**

We don't believe it is advisable to assume compliance with laws and regulations. A company gains market advantage by touting its greener products and regulatory compliance is one way of showing environmental and social responsibility.

On the other hand this section should also mention that the pursuit of greener products and processes can have an assortment of benefits for the company-- cost savings, reduced regulatory compliance issues & opportunities for third party award recognition, employee health and safety benefits, and increased market share.

### 3 Definitions

There are some definitions with problems in relation to each other.

**Co-product:** "However, for the purposes of this standard, chemical recovered for use as fuel ( for energy recovery) is not considered co-product; it is considered as a waste."

**Waste:** "Wastes used as fuel are not considered a co-product but would be considered recovered energy."

Clearly there is an inconsistency here, between these definitions. We recommend that "waste be identified as waste" and not be allowed to be declared a fuel, when the primary objective is destruction of waste materials. Waste is a critical indicator of the efficiency of a process. Changing the classification to "fuel" or "recovered energy" means allowing a huge loophole as well as the conversion of waste into air emissions. We also wish to reference Section 6.1 which talks about what a greener process is in relation to waste and 6.2 that talks about reducing waste generation.

**Renewable Energy.** The use of Municipal Solid Waste to extract thermal energy is not a sustainable and clean source of renewable energy. Municipal Solid Waste can recover far more saved energy through reuse, recycling, composting and anaerobic digestion. EPA's WARM model tells us that recycling recovers 4-5 times the energy that an incinerator recovers. Most importantly incinerators destroy materials including virgin materials and fail to recover all the processing inputs that went into the extraction of natural resources, and preparation to deliver a final product.

#### 4.1 Purpose

Here we have reference to the option of self-certification, second party certification and third party certification. No definitions have been provided and we are not clear on the meaning of second party certification. However, we are certain that this standard and any conformance reports will have almost no value for a business customer unless independent third party certification is included.

A business customer may glance at information provided, but he/she will not want to rely on that information if it is only self-certified. We also note that Appendix B has been inserted regarding certification, but that it is not part of this standard.

**We believe independent third party verification and certification should be an absolutely essential part of this standard.**

#### 4.2.2 Product Identification

3. Identify by Chemical Abstract numbers all constituents down to 1 ppm, whether intentionally added or not.

We frankly do not understand why a & b were written as they are. They are not clear and are confusing. Complete Test data should be made available to the customer for the product as sold.

#### **5.4 Tier I Chemical Characteristics**

It is most important that data gaps be actively reported under this standard. Information regarding the absence of test data is as important as findings from test data. When filling out health effects testing information -NO TEST DATA-- should be written in where no testing has been done.

#### **5.5 Reporting Tier I Chemical Characteristics**

This standard is supposed to be about Greener Chemicals and Processes and about information to a business customer. A manufacturer should not be able to call basic health and environmental data "confidential business information." Allowing this option makes this standard - NOT Green.

#### **6.2 Chemicals Efficiency and Waste Prevention**

A greener chemical process better maximizes the conversion of chemical inputs and reuse of auxiliary chemicals to manufacture a unit of chemical product, and thus reduces waste generation and depletion of natural resources.

Half way through the document, we finally have a definition of a greener chemical process, although it is one that focuses on efficiency and natural resources, with no mention of toxicity.

##### **6.2.3 Generation of Chemical Wastes**

This purpose of this section is to identify the extent to which the process generates waste that is classified as hazardous or dangerous to health or the environment and relates to chemical waste released to media-- air and water as well as solid and liquid wastes.

Under 6.2.3.2 Reporting a) there should be a clear delineation and separation of air and water discharges, solid and liquid wastes and their treatment or disposal, rather than the current yes or no response to whether waste is hazardous or dangerous by regulation.

Specific details on the chemicals discharged through air emissions, water discharges and as wastes should be included with chemical identity and actual quantity, not just an approximate percentage.

#### **6.3 Water**

While appearing to be more detailed, under 6.3.3.2 Water Discharge, the manufacture is asked to only provide the sum of all discharges per unit of production. Again each specific chemical and quantity is needed, not a combined sum.

## 6.4 Energy

For all relevant environmental components under this standard, including energy, there should be a place for a manufacturer to state its pursuit of environmental objectives in previous years. A manufacturer may have acquired an energy audit, installed and implemented energy efficiency measures recommended, such as new pumps, installed solar panels or a windmill or purchased renewable energy. A manufacturer who is a leader, but cannot claim this activity will be at a disadvantage from another company that only initiates the work under this standard.

### 6.6.2 Process Safety Scope

The scope focuses on "retrospective based measurement of incidents." While this is certainly appropriate, the manufacturer should state what it does on an ongoing basis toward assuring process safety, for example, process safety audits & frequency, use of 3rd party consultations, implementation of recommendations, substitution of high hazard chemicals, reduced inventory of extremely hazardous substances, frequency of scheduled maintenance, design for inherent safety, comprehensive post-incident reviews for lessons learned, etc.

## 7 Social Responsibility

An important aspect of social responsibility would be having an **Established Process for Worker Involvement in process safety, chemical emissions and discharges, occupational exposures and chemical process improvements.**

**A.3** The Final Report should address the principal chemical product as well as other chemicals present in the final product. Health and hazard information should include these other constituents present in the final product unless constituting less than 1 ppm.

We have attached "**PRINCIPLES for a GREENER CHEMICALS and PROCESSES STANDARD**" which were submitted earlier to the Committee. We support these principles.

Thank you for your attention.

Sincerely,



Barbara J. Warren  
Executive Director

## **PRINCIPLES for a GREENER CHEMICALS and PROCESSES STANDARD**

March 10, 2010

*Submitted to the Joint Committee for a Standard for Greener Chemicals and Processes  
by Tracey Easthope, Lin Kaatz Chary, Beverly Thorpe*

### Overall Framework and Vision Statement

A voluntary greener chemicals and processes standard should be visionary in its goals. It should set out the ideal, and set benchmarks to measure progress against that ideal.

A greener chemicals and processes standard should be informed by four main visionary goals:

1. All materials used (feedstocks, reagents, solvents) or generated (product, waste, etc) in a process should not possess intrinsic toxicological, physical, or ecological hazards.
2. All energy consumed should be renewable, sustainable, non-depleting, and non-polluting.
3. Material and energy efficiency in production processes and use phases requires all inputs to be incorporated into the product or function.
4. All materials generated must be able to degrade innocuously and rapidly into the environment.

These goals are aspirational but present a model for the structure of the ideal greener chemicals and processes standard – a standard that will protect human and ecosystem health, conserve energy and materials, and assure economic viability. The standard should provide a yardstick to evaluate existing chemicals and to inform the development of new chemicals and materials. The standard must set criteria that reflect and proactively advance these goals.

### Purpose of the Standard

The purpose of a voluntary greener chemicals and processes standard is:

- to set out clear aspirational goals to drive continuous improvement
- to provide a practical, usable metric by which those engaged in the chemical enterprise can assess their progress in moving toward those goals
- to establish a dynamic set of practical criteria that can adapt to new science and realities, providing companies a way to anticipate future concerns
- to transparently provide information to the public on chemical hazards
- to transparently inform the supply chain of chemical hazards

The standard should acknowledge best in class international practice and developments that advance the use of greener chemicals and processes. Recognizing global norms and the emerging development of precautionary lists and standards assures that users retain competitive advantage in the global marketplace. The standard should not seek to contradict, undermine or preclude strong, enforceable regulations or policy developments that advance the four goals, either within or outside of the U.S.

### Content of Standard

In order to be credible, practical and useful the standard must:

- be driven by the inherent hazard characteristics of chemicals not risk analysis
- include a range of endpoints that reflect the wide range of known and potential impacts to health and the environment from exposure to chemicals (include at a minimum endocrine disruptors, immunotoxicants, neurodevelopmental toxicants, and multi-generational toxicants in addition to standard endpoints)
- include a range of chemical characteristics which include at a minimum persistence in the environment, flammability, explosivity, and bioaccumulation
- seek predictive tools and indicators to help with the design of more benign chemicals <sup>(1)</sup>
- regularly review the need to add new endpoints of concern as research advances
- regularly incorporate new tools to evaluate endpoints of concern
- regularly incorporate new tools that can improve, accelerate and facilitate chemical evaluation
- consider the entire life cycle impacts of chemicals in the standard, including extraction, formulation, transformation, use, disposal, and degradation,
- transparently identify all data gaps
- chemicals with missing data should be transparently disadvantaged in the greener chemicals standard setting process
- incorporate a transparent weight of evidence approach that is highly precautionary in the consideration of data
- reference authoritative international chemical lists, screening lists and classifications
- specifically note the problems in incorporating nanotechnology/genetically modified organisms and synthetic biological materials. These emerging technologies lack both an adequate regulatory framework and data set of environmental and health impacts to preclude any assumption that they are inherently greener solutions.

#### Transparency, Accountability and Balanced Representation

Standard development, decision-making, the process of standard revision and certification must be done in the most transparent manner, with all levels of responsibility and accountability clearly delineated and with balanced, meaningful representation by industry, government, academic, environmental health and public interest groups. Affiliations of all committee members and participants must be publicly available.

All data used to claim certification of a greener chemicals and processes standard must be available and transparent.

The standard should require that all tools recommended by the standard be open source and completely transparent.

#### Confidential Business Information

Claims of confidential business information to withhold data on chemicals should be considered as missing data by the standard setting process.

#### Certification

Certification with the standard should be third party independently verified.

#### Standard Revision

The standard should be reviewed annually for emerging scientific and technological advances and should incorporate a transparent and open process to quickly adapt and reflect best practice. This ensures that the standard does not become static and lose its relevancy and credibility in the marketplace.

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#### Footnote

<sup>(1)</sup> The following chemical characteristics may be important predictors for toxicity and should be considered:

- is the chemical hydrophilic or lipophilic
- molecular weight
- ability to partition to a gas
- electrical charge and how this charge influences its physical and biochemical behavior
- potential for the shape, structure and composition to influence biological availability and mechanism of action
- ability to cross the blood-brain barrier
- ability to penetrate the lungs, skin, or gastrointestinal tract
- ability to effect gene expression
- potential for cellular absorption
- potential for genetic receptor binding