CRITERIA FOR CERTIFICATION
ENVIRONMENTAL INNOVATION, GS-20 Edition 2.0
Sub-Category: Pesticides – Contact-Kill Insecticides

APPLICANT INFORMATION:	
Company:	Nyco Products Company
Product Name:	Bug Eliminator
Website:	https://www.nycoproducts.com/

Introduction. Green Seal's Environmental Innovation Standard (GS-20) provides a framework for the certification of environmental innovations. This certification demonstrates that an independent third party has verified the innovative aspect(s) of a product results in a significant reduction of human health and environmental impacts compared to products of the same functional class, achieving innovations not previously demonstrated within a product category. Certification neither constitutes the development of a product category standard or benchmark, nor does it require competitors within a product category to use the same innovation strategies in their approach to claiming innovation.

Certification of Environmental Innovation. If the applicant can demonstrate the product conforms to all criteria within this document, Green Seal will provide a Certification of Environmental Innovation.

Innovation Claim. Applicant statement: Compared to alternative products, the product is formulated with ingredients that are less hazardous to human health for the following hazards - Reproductive Toxicity, Endocrine Disruption, Neurotoxicity/Systemic Toxicity, Aspiration Toxicity, Acute Toxicity, Skin Corrosion, Respiratory Sensitization, Skin Sensitization, Fragrance Allergen, and Bioaccumulation.

Disclaimer. This certification is not intended to identify all possible negative impacts and cannot rule out any unknown negative consequences from the use of this product.

Public Comment. A public comment period on the Draft Criteria will be held from November 18, 2020 to December 23, 2020.

OVERVIEW

1.0 Eligibility

Nyco Bug Eliminator by the company NYCO PRODUCTS COMPANY is eligible to be certified under the Environmental Innovation Standard (GS-20, Edition 2.0) because the product:

1. Is commercially available,[1]
2. Exists within a market that has comparable options that achieve the same function, and
3. Has life cycle phases for which there exists published health and environmental impact information from credible sources.

Product Function

NYCO BUG ELIMINATOR is a contact-kill insecticide that is intended for use in restaurants, foodservice and food-processing plants, the hospitality industry, warehouses, and manufacturing and industrial facilities.

The applicant product is formulated to kill soft-bodied insects that can pose sanitation problems in food-handling settings. Targeted pests include:

- Argentine ants
- German cockroaches
- Bed bugs
- Red fruit flies
- House flies
- House spiders
- Moth flies
- Two-spotted spider mites

Comparable Alternatives

Comparable alternative products include contact-kill insecticides used in restaurants, food-service facilities, food-processing plants, the hospitality industry, warehouses, and manufacturing and industrial facilities which also target similar soft-bodied insects. Products used exclusively for agricultural or horticultural applications are not considered comparable under the Draft Criteria.

Comparable alternatives include soap-based, oil-based, and mineral-based insecticides, synthetic insecticides (i.e., organochlorines, organophosphates, carbamates, pyrethroids insecticides), and bait stations.

Insecticide types **not** considered comparable alternatives are microbials (considered a biopesticide by EPA) and insect growth regulators (IGRs are not direct contact-kill insecticides).

Legal Compliance

Manufacturer shall not be in violation of any applicable environmental regulations or laws nor any applicable regulations under the authority of the U.S. Federal Trade Commission, U.S. Food and Drug Administration, or the U.S. Environmental Protection Agency (or equivalent if based outside the United States).

[1] NOTE from application - The product has just been developed and is in the process of being commercially introduced.

2.0 Product Life cycle Impact Review

This section documents the anticipated human health and environmental life cycle impacts associated with contact-kill insecticides, noting the most significant (i.e., greatest in negative effect) impact.

Table 1: Summary of Life Cycle Impact Review

Life Cycle Phase	Impacts Identified
Resource Extraction	No significant impacts identified
Use and Manufacturing	**Environmental hazards:** 1. Soil and groundwater infiltration 2. Water pollution, and decreased water quality 3. Eutrophication, especially when nitrogen and phosphorus are present 4. Negative impacts to aquatic life, soil chemistry, terrestrial plants, and wildlife 5. Bioaccumulation **Human Health hazards:** 1. Reproductive Toxicity 2. Endocrine Disruption 3. Neurotoxicity/Systemic Toxicity 4. Aspiration Toxicity 5. Acute Toxicity 6. Skin Corrosion 7. Respiratory Sensitization 8. Skin Sensitization 9. Fragrance Allergen
Waste Management and Disposal	No significant impacts identified

Resource Extraction Phase

Raw Materials

Raw materials used for insecticide production include active ingredients that kill the pest and inert ingredients that may, for example, help facilitate spraying/coating a surface. Active ingredients are produced in factories by distillation from natural raw materials or created synthetically in a laboratory from petroleum hydrocarbons. Synthetic insecticides have the greatest impact of all the contact-kill insecticides reviewed in this standard with well-known human and environmental health impacts related to air, water, and land.[2] Following the synthesis of the active ingredient in a chemical factory, formulation of the insecticide final product is completed in the same chemical factory/laboratory or sent to a formulator who prepares the liquid or powder final product.

Land Use / Resource Depletion

Contact-kill insecticides that are derived from plant-based raw materials may contribute to land-use issues and resource scarcity; however, compared to raw materials derived from petroleum hydrocarbons these impacts are not considered to be significant. The reason is that insecticides made with synthetic

[2] https://archive.epa.gov/sectors/web/pdf/oil-gas-report.pdf

hydrocarbons rely on the oil refinery industry which is well-known to have a variety of associated life cycle impacts.

Water Quality

Similar to land use and resource depletion impacts outlined above, synthetic insecticides are expected to more significantly impact water quality than other comparable alternatives (soaps, oils, minerals) due to the well-known impacts of environmental releases in the petroleum industry such as spills and accidental releases.

Climate Change / Global Warming Potential

Comparable alternative products that are manufactured and sold as aerosols have a high global warming potential. The US EPA provides a list of high-GWP gases and the GWPs for these gases can be in the thousands or tens of thousands.[3] This suggests that insecticides sold in aerosol form have a significantly greater impact on GWP than the applicant or comparable product sold in non-aerosol form.

The resource extraction and manufacturing phases for insecticides may also result in air pollution emissions to the environment due to the transportation of raw materials. Transportation of raw materials is not expected to be significantly different across insecticide types and therefore does not stand out as an issue that would contribute to significant drawbacks of the applicant product.

Use and Manufacturing Phases

Environmental Health

For the manufacturing phase, contact-kill insecticides may contribute to environmental health impacts such as water quality degradation, water pollution, eutrophication (especially when nitrogen and phosphorus are present), negative impacts from chloride to aquatic life, soil chemistry, terrestrial plants, and wildlife because of the manufacturing effluent potentially discharged to water or soil. This is particularly relevant for the comparable alternatives in the category of synthetic insecticides (i.e., organochlorines, organophosphates, carbamates, pyrethroids insecticides) that are commonly shown to have higher hazard in both human and environmental health categories (See Table 3) than other types of insecticides. The applicant product is formulated with ingredients that are readily biodegradable; however, there is an ingredient that shows high aquatic toxicity.

For the use phase, contact-kill insecticides, *while used according to manufacturer instructions for specific uses,* do not contribute to typical environmental impacts associated with direct discharge to the environment as is seen during manufacturing because the product is not directly discharged to water or soil. See also Section 5.19 for more information regarding the requirements for the Aquatic Toxicity Exemption.

Human Health

Contact-kill insecticides as a general category of pesticides may pose significant risks to human health for the manufacturing and use life cycle phases, specific to occupational settings.

There is wide variability of chemical formulations among comparable commercially available contact-kill insecticides used in restaurants, foodservice and food-processing plants, the hospitality industry, warehouses, and manufacturing and industrial facilities.

[3] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

Tables 2 and 3 below list common ingredients in comparable alternatives and their hazard classifications, as defined by Green Seal's GS-20 Standard. This table demonstrates how other products on the market and their human health and environmental hazards differ from the applicant product.

Tables 2 and 3 represent information on comparable alternatives gathered from publicly available sources, including but not limited to, product labels, technical data sheets, safety data sheets, REACH registrations, etc.

The common ingredients in comparable alternatives listed in Tables 2 and 3 were reviewed against the following hazard endpoints from GS-20 Section 5: *Carcinogens, Mutagens, Reproductive toxins;* Fragrance Allergens; Neurotoxins/systemic toxins; *Respiratory sensitizers;* Chronic aquatic toxicity; Ozone depleting compounds*;* Acute toxicity*; Skin sensitization*, *Skin corrosion*, *Eye damage; Asthmagens;* Bioaccumulating compounds.[4]

See Tables 1 and 2 below for a summary of the avoided hazards when comparing the applicant product to common ingredients of comparable alternatives. Only the relevant hazard properties are summarized in the tables where an impact reduction for the hazard was observed comparing the ingredients to the applicant product.

Table 2: Common Active Ingredients in Soap, Oil, and Mineral-Based Insecticides

(Contact Us for additional information)

Chemical Name	CAS No.	Relevant Hazard	Data Source
Clove oil	8000-34-8	• Skin Sensitization	ECHA C&L Inventory (CASRN 8000-34-8) - GHS Category 1B, H317
		• Acute Toxicity	SDS – Oral LD50 rats: 2.650 mg/kg
Cedarwood oil	8000-27-9	• Skin Sensitization	EU SCCS
		• Bioaccumulating Compound	PubChem - log Kow 4.73 (estimated)
Citronella oil	8000-29-1	• Skin Sensitization	ECHA C&L Inventory (CASRN 8000-29-1) - GHS Category 1, H317
		• Respiratory Sensitization	ECHA C&L Inventory (CASRN 8000-29-1) - GHS Category 1, H334
		• Acute Toxicity	SDS – Oral LD50 mouse: 4,600 mg/kg
Geraniol	106-24-1	• Skin Sensitization	ECHA C&L Inventory (CASRN 106-24-1) – GHS Category 1B, H317
		• Acute Toxicity	ECHA Brief Profile (CASRN 106-24-1) – Oral LD50 rats 3600 mg/kg
		• Fragrance Allergen	Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products
Cinnamon Oil	8015-91-6	• Skin Sensitization	ECHA C&L Inventory (CASRN 8015-91-6) – GHS Category 1, H317
		• Respiratory Sensitization	ECHA C&L Inventory (CASRN 8015-91-6) – GHS Category 1, H334
		• Acute Toxicity	ECHA - Oral LD50 rats: 3458 mg/kg

[4] See the GS-20 Standard for Environmental Innovation for Section 5 criteria for hazard requirements and definitions.

Chemical Name	CAS No.	Relevant Hazard	Data Source
Rosemary oil	8000-25-7	• Skin Sensitization	ECHA C&L Inventory (CASRN 8000-25-7) - GHS Category 1, H317
		• Aspiration Toxicity	ECHA C&L Inventory (CASRN 8000-25-7) – GHS Category 1, H304
Eucalyptus oil	8000-48-4	• Skin Sensitization	ECHA C&L Inventory (CASRN 8000-48-4) – GHS Category 1, H317
		• Acute Toxicity	ECHA - Oral LD50 rats: 3320 mg/kg
Lemongrass oil	8007-02-1	• Skin Sensitization	ECHA C&L Inventory (CASRN 8007-02-1) – GHS Category 1, H317
		• Aspiration Toxicity	ECHA C&L Inventory (CASRN 8007-02-1) – GHS Category 1, H304
Thyme oil	8007-46-3	• Skin Sensitization	ECHA C&L Inventory (CASRN 8007-46-3) – GHS Category 1, H317
		• Skin Corrosion	ECHA C&L Inventory (CASRN 8007-46-3) – GHS Category 1B, H314
		• Acute Toxicity	ECHA – Oral LD50 rat: 4700 mg/kg
Cottonseed oil	8001-29-4	No relevant hazards identified	ECHA C&L Inventory (CASRN 8001-29-4)
Peppermint oil	8006-90-4	• Skin Sensitization	ECHA C&L Inventory (CASRN 8006-90-4) – GHS Category 1, H317
		• Acute Toxicity	SDS – Oral LD50 rat 2426 mg/kg
Calamus oil (Acorus calamus L.)	8015-79-0	No relevant hazards identified	ECHA C&L Inventory (CASRN 8015-79-0)
Carvacrol (many plant species)	499-75-2	• Skin Sensitization	ECHA C&L Inventory (CASRN 499-75-2) – GHS Category 1, H317
		• Skin Corrosion	ECHA C&L Inventory (CASRN 499-75-2) – GHS Category 1B, H314
		• Acute Toxicity	ECHA Brief Profile (CASRN 499-75-2) – Oral LD50 rat = 810 mg/kg
Linalool (many plant species)	78-70-6	• Skin Sensitization	ECHA C&L Inventory (CASRN 78-70-6) – GHS Category 1B, H317
		• Acute Toxicity	ECHA Brief Profile (CASRN 78-70-6) – Oral LD50 mouse = 2200 mg/kg
		• Fragrance Allergen	Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products
Vanillin	121-33-5	• Skin Sensitization	ECHA C&L Inventory (CASRN 121-33-5) – GHS Category 1, H317
		• Acute Toxicity	ECHA Brief Profile (CASRN 121-33-5) – Oral LD50 rat = 3978 mg/kg

Table 3: Common Active Ingredients of Synthetic Insecticides (Contact Us for additional information)

Chemical Name	CAS No.	Relevant Hazard	Data Source
Imiprothrin	72963-72-5	• Skin Sensitization	EPA
		• Acute Toxicity	ECHA - Oral LD50= 630 mg/kg
Cypermethrin	52315-07-8	• Skin Sensitization	ECHA C&L Inventory (CASRN 52315-07-8)
		• Neurotoxicity/Systemic toxicity	ECHA C&L Inventory (CASRN 52315-07-8) – GHS STOT RE 2 – H373
		• Acute Toxicity	ECHA – Oral LD50: 500 mg/kg
		• Endocrine disruption	EPA
Cyfluthrin	68359-37-5	• Acute Toxicity	ECHA – Acute oral toxicity: 14.3 mg/kg
Pyrethrins	8003-34-7	• Acute Toxicity	PubChem – Oral LD50 rat: 200 mg/kg
DELTAMETHRIN (DECA-)	52918-63-5	• Skin Sensitization	ECHA (CASRN 52918-63-5)
		• Acute Toxicity	PubChem – Oral LD50 rat= 128 mg/kg
2-[1-methyl-2-(4-phenoxyphenoxy) ethoxy] pyridine	95737-68-1	• Skin Sensitization	ECHA C&L Library (CASRN 95737-68-1) – GHS Category 1, H317
Fipronil	120068-37-3	• Neurotoxicity/Systemic toxicity	ECHA C&L Library (CASRN 120068-37-3) – GHS STOT RE 1, H372
		• Acute Toxicity	PubChem – Oral LD50 rat= 92 mg/kg
Piperonyl butoxide	51-03-6	• Acute Toxicity	ECHA – Oral LD50: 4500 mg/kg
		• Reproductive Toxicity	ECHA C&L Library (CASRN 51-03-6) – GHS Category 2, H361 (unborn child)

Waste Management and Disposal

Disposal of unused product (i.e., possible direct release to the environment) is a potential waste management and disposal life cycle concern because many contact-kill insecticides, including this product, show elevated aquatic toxicity; therefore, disposal to municipal sewer systems is not recommended. To mitigate this potential disposal impact, excess product should be applied only to an area listed on the label or to a hazardous-waste collection site. Containers should be triple-rinsed before disposal or recycling.

The product is expected to be toxic to aquatic life based on the characteristics of its ingredients.

The product is expected to be readily biodegradable based on the characteristics of its ingredients.

CERTIFICATION REQUIREMENTS

3.0 Environmental Innovation Review

This section details the applicant's proposed innovation claims including:

- Innovation Summary: describes how the applicant claims the product differs from comparable products on the market,
- An Impact Reduction Statement: describes how the applicant claims their product's innovation results in reductions of significant life cycle impacts identified in the Product Life Cycle Impact Review (Section 2.0 herein),
- Market Analysis: describes the parameters for the applicant to demonstrate their claim that the product is the first and only product of its type to achieve this innovation during the Certification Phase, and
- Drawbacks Analysis: a summary of any potential drawbacks that Green Seal has identified and mitigations necessary.

The applicant has opted to demonstrate innovation through *Option 1: Improved Design*, which states: Demonstrate a minimum of 30% reduction of one or 20% in each of two or more significant environmental or human health impacts, as identified in Section 2.0.

3.1 Innovation Summary – How does this product differ from others on the market?

The applicant claims that this product differs from other contact-kill insecticides on the market because it is not formulated with hazardous chemicals that are common to these products.

The primary innovation claim for this certification is:

"This product is not formulated with hazardous ingredients common to this product category. Those common ingredients are classified in the following human health hazards categories: Reproductive Toxicity, Endocrine Disruption, Neurotoxicity/Systemic Toxicity, Aspiration Toxicity, Acute Toxicity, Skin Corrosion, Respiratory Sensitization, Skin Sensitization, Fragrance Allergen, and Bioaccumulation."

During the Certification Phase, Green Seal will verify these claims through a technical review.

3.2 Impact Reduction Summary – How does the innovation result in impact reduction?

The major health and environmental impact reductions are achieved during the manufacturing and use phases. This product is formulated only with safer ingredients that are not classified as hazardous in the following ways:

1. Reproductive Toxicity
2. Endocrine Disruption
3. Neurotoxicity/Systemic Toxicity
4. Aspiration Toxicity
5. Acute Toxicity
6. Skin Corrosion
7. Respiratory Sensitization
8. Skin Sensitization
9. Fragrance Allergen
10. Bioaccumulation

The avoidance of all of the above hazards, shared across the majority of comparable alternatives, is sufficient to meet the Option 1 Improved Design impact reductions.

During the Certification Phase, Green Seal will verify these claims through a technical review.

3.3 Market Analysis – How unique is the innovation?

An initial market analysis conducted in April 2020 shows that no other product in this category on the North American market claims to 1) avoid the use of hazardous chemicals and 2) target the same insect profile.

3.4 Drawbacks Analysis – Has Burden Shifting occurred?

As a result of a drawbacks analysis, Green Seal has not noted any burden shifting resulting from this product innovation. No mitigation actions are required.

4.0 Evaluation of Functional Performance and Fitness for Purpose

This section details the requirements for demonstrating that the product functions effectively.

Test Methods

Applicant shall meet the requirements in this section to demonstrate the product functionally performs at least as well as or better than at least one nationally recognized or market leading product of its type, to be approved by Green Seal. Alternatively, the applicant shall demonstrate the product meets existing performance standards for the product type. The applicant shall provide evidence that the test is used as an industry standard, and that any referenced thresholds are accepted as sufficient to demonstrate performance in that product category.

The applicant shall use objective, scientifically validated testing methods conducted under controlled and reproducible laboratory conditions to demonstrate functional performance along the following parameters:

1. US EPA requires products that are marketed to kill, repel, or control insects to meet its efficacy guidelines, regardless of any designation as an EPA 25(b) Minimum Risk Pesticide exempt from pesticide registration. To make "knockdown," "quick kill" or "kills on contact" claims, data should be provided that show the following (See the EPA Guidance on Efficacy (https://www.epa.gov/pesticide-registration/guidance-efficacy-testing-pesticides-targeting-certain-invertebrate-pests):
   a. ≥90% knockdown within 10 seconds for stinging Hymenoptera (including fire ants) or within 30 seconds for all other arthropods; and
   b. ≥90% mortality by 96 hours post-treatment.

   In addition, similar claims may be made with a time qualification (e.g., "kills quickly within 10 minutes") if data show:
   a. ≥90% knockdown at the labeled time qualification; and
   b. ≥90% mortality by 96 hours post-treatment.

   Under both scenarios, treatment groups should be statistically different from control groups, and control mortality should remain ≤10%.

5.0 Environmental and Human Health Requirements

This section describes the Environmental and Human Health requirements with which the applicant product must demonstrate compliance. Green Seal uses the following factors to determine requirements for this section:

Product Form: the applicant product is a water-based solution.

Potential for Direct Human Exposure: through regular handling and use of the product, the potential for inhalation and skin absorption is present.

Potential for Environmental Releases: as described herein, when the product is used as intended, the product does create environmental releases to air, water, wastewater, and land.

See Annex A and the GS-20 Standard for definitions and full criteria details.

5.1 Disclosure
Applicant shall disclose all product components to the certification program, including the chemical names, the Chemical Abstracts Service (CAS) registry numbers, and the levels (% by weight) present in the product.

5.2 Carcinogens, Mutagens, and Reproductive Toxins
The product shall not contain any components that are carcinogens, mutagens, or reproductive toxins.

5.3 Prohibited Components
The product shall not contain the following components.

- 1,2-dichlorobenzene
- 2-butoxyethanol
- Alkylphenol ethoxylates
- Formaldehyde donors
- The heavy metals lead, mercury, cadmium, hexavalent chromium, and antimony in the
- elemental form or compounds
- o-Phenylphenol
- Neonicotinoid pesticides
- Nitro-musks
- Phthalates
- Polycyclic musks
- Triclosan
- Triphenyl tins and tributyl tins

5.4 Volatile Organic Compounds
The VOC content of the product as used shall contain no more than the current regulatory limits of the Air Resources Board for the State of California (CARB) for its product category. If no CARB limit exists for the product category, Green Seal will determine the acceptable VOC content.

5.5 Animal Testing
Green Seal will accept previous test results as evidence of meeting a criterion in order to avoid new animal testing.

5.6 Acute Toxicity
The product shall not be toxic to humans when inhaled or ingested.

5.7 Skin and Eye Damage
The product shall not cause skin corrosion or cause serious eye damage.

5.8 Asthmagens
The product shall not contain any components that have been identified as asthmagens.

5.9 Respiratory Sensitization
The product shall not contain any components that have been identified as respiratory sensitizers.

5.10 Skin Sensitization
The product shall not be a skin sensitizer.

5.11 Skin Absorption
The undiluted product shall not contain components present at 1% or more in the product that are listed on the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) list carrying a skin notation or substances that are listed on the German Deutsche Forschungsgemeinschaft (DFG) maximum allowable concentrations (MAK) list with a skin absorption H notation. Further, the product shall not contain components at 0.01% or more in the undiluted product that sum to 1% in the formula that are listed on ACGIH or DFG with the same target organ.

5.12 Chronic Inhalation Toxicity
The product as used shall not contain components that are classified as producing significant toxic effects in mammals via inhalation, with a possible inhalation exposure pathway according to Organization for Economic Co-operation and Development (OECD) Harmonized Integrated Classification System for Human Health and Environmental Hazards of Chemical Substances and Mixtures.

5.13 Combustability
The product shall not be combustible.

5.14 Fragrances
All fragrances used shall be produced and handled following the code of practice of the International Fragrance Association (IFRA).

5.15 Colorants
The product formulation does not contain colorants; therefore, this requirement does not apply.

5.16 Bioaccumulating Compounds
The product shall not contain any components that bioaccumulate or are known to form degradation products that bioaccumulate.

5.17 Eutrophication
The product shall not contain phosphorus at more than 0.5% by weight.

5.18 Aquatic Biodegradability

Each of the individual organic components shall exhibit ready biodegradability in accordance with the OECD definition, except for polymers.

5.19 Toxicity to Aquatic Life

The product as used shall not be toxic to aquatic life. A product is considered not toxic to aquatic life if the lowest available and most representative acute lethal concentration (LC50) data for fish, daphnia, or algae is greater than or equal to 100 mg/L.

For purposes of demonstrating compliance with this requirement, data for each of the product's components may be used to calculate a weighted average. The preferred sources of data come from the following appropriate protocols in the International Organization for Standardization (ISO) 7346-2 for fish, OEDC Test Guidance (TG) 203 for fish, OECD TG 202 for daphnia, or OECD TG 201 for algae.

Exemption: Green Seal has exempted one ingredient that is, at its concentration in the final product, toxic to aquatic life. This ingredient is acceptable in this case because:

- the ingredient is readily biodegradable
- the ingredient is noted as environmentally benign by multiple independent authorities including the US EPA and Environment Canada.
- the product label includes instructions for product use only for terrestrial / non-aquatic applications.

Therefore, the release of this chemical during the use of this product is unlikely to pose risk to surrounding aquatic ecosystems.

Due to the ingredient exemption under section 5.19, the product must have the following statement on the SDS and Label:

> "To protect the environment, do not allow pesticide to enter or run off into municipal water supplies or surface waters. This product may be hazardous to aquatic invertebrates."

5.20 Bleaching

The product does not contain fiber-based materials; therefore, this requirement does not apply.

5.21 Additional Product-Specific Requirements

The product shall not be formulated with any chemical listed in Table 2 and 3.

6.0 Packaging Requirements

Applicant shall meet the following packaging requirements as applicable.

Primary and Secondary Packaging

Primary and secondary packaging shall meet the following requirements, based on the packaging material type:

1. Packaging made from paper or paperboard shall be *recyclable* and made from 100% recovered material.

2. Packaging made from containerboard (corrugated cardboard) shall be *recyclable* and made from at least 30% recovered material.
3. Packaging made from plastic shall be *recyclable*, or source-reduced by 20%, or shall contain 25% recovered material content (pre- or *post-consumer material*).

Plastic Labeling
Plastic packaging shall be marked with the appropriate Resin Identification Code.

Concentrated Product Packaging
Not applicable to this product category

Heavy Metal Restrictions
The heavy metals lead, mercury, cadmium, and hexavalent chromium shall not be *intentionally introduced.* Further, the sum of the concentration levels of these metals shall not exceed 100 ppm; an exception is allowed for *refillable packages* or packages that would not exceed this maximum level but for the addition of *post-consumer material*.

Other Restrictions
Phthalates, bisphenol A, and chlorinated packaging material are prohibited from being intentionally introduced to plastic packaging; an exception is allowed for packages that would not have added phthalates, bisphenol A, or chlorinated packaging material but for the addition of post-consumer material.

7.0 Certification Requirements

Applicant shall meet all certification requirements described herein.

Certification Term
The initial Certification Term shall be 4 years. After the Certification Term, the applicant has the option to undergo Recertification.

Site Visit
The applicant shall undergo a site audit of product manufacturing facilities that includes verifying product characteristics and quality manufacturing processes.

Labeling Requirements for Products Sold as Liquids

- **Label Language.** The use instructions shall be in English and another language or English and a graphical representation or icons.
- **Label Dilution or Dosage Directions for Concentrates**. For concentrates, the manufacturer's label shall state clearly and prominently that dilution with water from the unheated tap is recommended, unless tested otherwise to meet product performance requirements, and shall state the recommended level of dilution or dosage (e.g., for products that use manual dilution or dosage, state amount of product in common and measurable terms such as milliliters, ounces, teaspoons, or capfuls.
- **Label Use and Disposal Directions**. The product label shall have explicit disposal, recycling, reuse, or refill instructions, proper and clear directions for use, and appropriate precautions and recommendations for the use of personal protective equipment.

Ingredient Line

The product label shall list the product ingredients using the naming convention of the International Nomenclature of Cosmetic Ingredients (INCI) in order of predominance. Where an INCI name does not exist for an ingredient, alternative nomenclature may be used. Ingredients in concentrations of less than 1% may be listed in any order after those in concentrations of more than 1%. A chemical function or chemical class descriptor may be used to protect trade secret information.

Fragrance Labeling
The product label and SDS shall declare if a fragrance has been added or if no fragrance has been added. If applicable, liquid products with no fragrance added shall state that no fragrance has been added.

Allergen Labeling
The product label and SDS shall indicate any allergen components present in the product at 0.01% or more (e.g., "Contains allergen [allergen's INCI name]"). Where an INCI name does not exist, alternative nomenclature may be used.

Certification Mark
The Green Seal® Certification Mark may appear on the product, packaging, secondary documents, and promotional materials, only in conjunction with the certified product. Use of the Mark must be in accordance with Rules Governing the Use of the Green Seal Certification Mark.

The Green Seal Certification Mark shall not be used in conjunction with any modifying terms, phrases, or graphic images that might mislead consumers as to the extent or nature of the certification.

Green Seal must review all uses of the Certification Mark prior to printing or publishing.

Use with Other Claims
The Green Seal Certification Mark shall not appear in conjunction with any human health or environmental claims unless verified and approved in writing by Green Seal.

Statement of Basis for Certification
Wherever the Green Seal Certification Mark appears, it shall be accompanied by a description of the basis for certification. The description shall be in a location, style, and typeface that are easily readable. If online space is limited, a link to the basis of certification may be used. Green Seal shall develop a statement of basis for certification for each product.

ANNEX A (Glossary of Terms)

Note that the defined terms are italicized throughout the Environmental Innovation Standard, GS-20.

Asthmagen. A substance designated as an asthma causing agent by the Association of Occupational and Environmental Clinics (AOEC), which after review by AOEC have met the AOEC sensitization criteria.

Aspiration Toxicity. A hazard, as identified by the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) when a chemical may be fatal if swallowed and enters airways, code H304.

Burden Shifting. A concept within product life cycle review frameworks that defines an unintentional consequence of a change in the system that results in a reduction in one impact category and a significant increase in another impact category, e, g., carbon emissions.

Carcinogen. A chemical listed as a known, probable, reasonably anticipated, or possible human carcinogen by the International Agency for Research on Cancer (Groups 1, 2A, and 2B), National Toxicology Agency (Groups 1 and 2), EPA Integrated Risk Information System (weight-of-evidence classifications A, B1, B2, C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or by Occupational Safety and Health Administration (as carcinogens under 29 Code of Federal Regulations (CFR) 1910.1003(a)(1)).

Colorant. A product *component*, such as a dye or pigment, whose only function is to change the product's color.

Component. A constituent that is deliberately added at any level for its continued presence in the final product to provide a specific characteristic, appearance, or quality[5] or a contaminant that was not deliberately added but is present above 0.01% by weight in the product.

Exposure Pathway. The way in which a person can be exposed to a hazardous substance. A complete exposure pathway includes (1) the source of chemical and mechanism for release, (2) the exposure point, (3) the transport medium (i.e., from source to exposure point, if different), and (4) the exposure route (e.g., ingestion, inhalation, absorption, etc.).

Fragrance. An additive, often (but not limited to) a multi-*component* additive, used in a product with the purpose of imparting a scent to the product.

Independent Laboratory. A laboratory that (1) has been recognized by a laboratory accrediting organization to test and evaluate products to a related product standard, and (2) is free from commercial, financial, and other pressures that may influence the testing and evaluation process.

Intentionally Introduced. The use of substances for their desired or deliberate presence in the *primary package* for the purpose of providing a specific characteristic or quality. It does not refer to the use of substances as processing aids or the use of an intermediate that imparts certain chemical or physical changes during manufacturing, as long as the substance or intermediate is present in the *primary package* at concentrations below 100 ppm.

Mutagen. A chemical that meets the criteria for Category 1, chemicals known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans, under the GHS.

Natural Colorant. A *colorant* that comes from biological products, forestry or agricultural materials (including plant, animal, and marine materials), or minerals.

[5] Naturally occurring elements and chlorinated organics that may be present as a result of chlorination of the water supply are not considered intentional components if the concentrations are below the applicable maximum contaminant levels in the National Primary Drinking Water Standards found in 40 CFR Part 141.

Post-Consumer Material. Material that would otherwise be destined for solid waste disposal, having completed its intended end-use and product life cycle. Post-consumer material does not include materials and by-products generated from, and commonly reused within, an original manufacturing and fabrication process.

Primary Package. Package material that physically contains and contacts the product, not including the cap or lid.

Product As Used. The most concentrated form of the product that the manufacturer recommends for a product's intended use.

Recyclable. The package can be collected in a substantial majority of communities, separated or recovered from the solid waste stream and used again, or reused in the manufacture or assembly of another package or product through an established recycling program.

Refillable Package. A container that is routinely returned to and refilled by the product manufacturer at least five times with the original product held by the package, and demonstrated in practice. For the purpose of this standard, the product manufacturer or the product manufacturer's agent may refill a package.

Reproductive Toxin. A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq., also known as Proposition 65).

Respiratory Sensitizer. A substance designated as leading to hypersensitivity of the airways following inhalation of the substance and meeting the classification criteria of Category 1 respiratory sensitization (H334) in accordance with the GHS.

Secondary Packaging. Packaging used to contain *primary package*/s and typically used for merchandizing. This does not include case or shipping packaging or the *primary package*.

Serious Eye Damage. The production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application. Substances identified under Category 1 for Serious Eye Damage/Eye Irritation (H318) under the GHS are also considered to cause serious eye damage.

Skin Corrosion. The production of irreversible damage to the skin, namely visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Substances designated as Category 1A, 1B or 1C for Skin Corrosion/Irritation (H314) under the GHS are also considered to cause skin corrosion.

Skin Sensitizer. A substance that will lead to an allergic response following skin contact.

Undiluted Product. The most concentrated form of the product produced by the manufacturer for transport outside its facility.