

Safer Consumer Products DRAFT Priority Product Work Plan



Three Year Work Plan

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Safer Consumer Products Program
Department of Toxic Substances Control



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1.0 INTRODUCTION AND WORK PLAN OVERVIEW

Launched in 2007, California's Green Chemistry Initiative included six policy recommendations to reduce public and environmental exposure to toxic chemicals. The Safer Consumer Products (SCP) program is the most prominent pillar in the Green Chemistry Initiative. It is the vehicle to achieve the policy recommendation to "accelerate the quest for safer products."

In October 2013, the SCP regulations went into effect and in March 2014 we proposed the first three Priority Products (product-chemical combinations) for which safer alternatives must be evaluated. The SCP Program is designed to encourage market shifts toward a green economy. It's with that intent that we are outlining the direction of the program for the next three years. Publication of this plan allows us to begin research and investigation into the seven product categories in the plan. These categories touch many aspects of our daily lives. Our work for the next three years will be to move from these broad categories to specific product-chemical combinations that warrant consideration as potential Priority Products.

A fundamental tenet of California's Green Chemistry Initiative is to maintain a scientific foundation for policy recommendations and decisions. As we developed this Priority Product Work Plan (Work Plan), chemistry, toxicology, and ecology all contributed to our decisions about what product categories to include. We will continue to rely on scientific, peer-reviewed, authoritative publications in researching product-chemical combinations drawn from the categories in this plan. We will leverage the knowledge and experience within other parts of the California Environmental Protection Agency (CalEPA) – the Office of Environmental Health Hazard Assessment (OEHHA), the State Water Resources Control Board, the Department of Pesticide Regulation, CalRecycle, and the California Air Resources Board. We will also reach out to other California governmental partners with deep subject matter expertise with respect to chemicals in consumer products, such as the Department of Public Health (CDPH). We will continue to work closely with the U.S. Environmental Protection Agency (U.S. EPA) to use their tools, information and resources in an efficient and collaborative manner. And we continue to work with the Green Ribbon Science Panel (GRSP) to develop sound decision making approaches that reflect the current state of the science.

We will augment our scientific understanding with available practical information about the chemicals and products of interest. In selecting the proposed initial Priority Products, we relied exclusively on publicly-available information for our decision making. We will implement this Work Plan and make future selections of Priority Products after input and dialogue with the people who design, manufacture and use these products. As part of that process we will gather information from non-public sources as part of our research. We may solicit information from manufacturers and their supply chain partners, as well as trade associations, and others with relevant expertise. We may also make targeted information requests to industry sectors and channels (i.e., data call-ins), and will gather information through public workshops and comment periods. In keeping with our commitment to transparency, we will make as much of this information as possible publicly available consistent with the protections for Confidential Business Information outlined in our regulations. We expect to engage in discussion with industry experts about product formulations, supply chain considerations, and industrial toxicology studies among other topics that can expand and refine our knowledge for the purposes of Priority Product selection.

Non-governmental organizations (NGOs) have been very active in evaluating product ingredients, researching public health issues faced by certain sensitive sub-populations, and advocating for ingredient transparency.

Through this work, they have gained extensive knowledge about consumer products. We will continue to solicit input from NGO stakeholders to inform our decisions.

We believe this plan provides a level of predictability to potential manufacturers, importers, retailers, and other stakeholders regarding the types of products that can be considered for evaluation over the next three years. This Work Plan serves as a signal to manufacturers who make products that fall into these categories. We expect that manufacturers will consider the product categories in this Work Plan, in conjunction with the Candidate Chemical list, to evaluate their product portfolios.

The discussion in this Work Plan outlines some of the considerations behind our product category selections. Finalization of this plan is the first step in identifying the next step of Priority Products. Our next step will be research and dialogue with affected stakeholders about these product categories. While the broad nature of some of the selected categories incorporates hundreds of potential Priority Products, we anticipate selecting a relatively small number, likely between five and ten per year, during the life of this Work Plan. Our initial proposed list of three Priority Products was small in number in order to proceed deliberately and carefully. We want to make sure this innovative process is credible, comprehensible, effective and successful. As the next few years unfold we will continue on an ambitious but prudent path working towards the ultimate goal of safer consumer products for our environment and the people of California.

2.0 BACKGROUND AND GOAL

The Department of Toxic Substances Control's (DTSC) Safer Consumer Products (SCP) regulations¹ require us to issue a Priority Product Work Plan (Work Plan) that includes two elements:

1. A description of “the **product categories** that the Department will evaluate to identify product-chemical combinations to be added to the Priority Products list during the subsequent three years”, and
2. A “general explanation of the decision to select the identified product categories for evaluation.”

An update to the Work Plan will be issued one year before the expiration date. Development of the Work Plan initiates a process providing stakeholders an opportunity to participate in the prioritization planning process and to provide us with information to make sound prioritization decisions.

The Work Plan does not specifically identify Priority Products or Chemicals of Concern. We will identify future potential Priority Products by choosing specific products from the categories identified in the Work Plan in conjunction with chemicals found on the Candidate Chemicals list (<http://www.dtsc.ca.gov/SCP/ChemList.cfm>). We may only identify a product as a Priority Product if it falls into one of the categories identified in the Work Plan. However, the SCP regulations allow us to revise the Work Plan within three years in two cases: if we are instructed to take action on a chemical and/or product through a legislative mandate or executive order, or in response to a granted petition as described in Article 4 of the SCP regulations.

Note: Because the Work Plan does not identify any Priority Products, it similarly does not identify any responsible entities or establish any requirements on manufacturers for compliance with the SCP regulations. The Work Plan is simply intended to provide a higher level of predictability regarding potential future regulatory actions by DTSC.

¹Division 4.5, Title 22, California Code of Regulations Chapter 55, §69501 et seq.

3.0 PRODUCT CATEGORY SCREENING APPROACHES

In selecting the proposed categories for the Work Plan, we considered the factors and criteria for Priority Product selection required by the SCP regulations. These factors include potential exposures, significant adverse impacts or end-of-life effects, as well as the availability of information, other regulatory programs, and safer alternatives. The extensive number of possible combinations of products, chemicals, and exposure scenarios which might make a product category an appropriate candidate for consideration, as well as the varied and the qualitatively different goals to be served by the SCP regulations (e.g., reducing exposures to sensitive populations versus protecting rare species) makes it impractical to create and use a ranking and scoring system for prioritization.

In lieu of a prescriptive process, we used multiple approaches to screen the breadth of consumer product categories. Using several approaches enabled us to look at the statutory and regulatory factors through multiple lenses that might be more or less relevant to a given product category.

The various approaches utilized were discussed at the June 25, 2014 meeting of the Green Ribbon Science Panel (<http://www.dtsc.ca.gov/SCP/GRSPPastMeetings.cfm>) and are summarized below.

1) Hazard Trait and Endpoint Approach

We considered a hazard trait and endpoint approach, which took into account possible environmental or toxicological endpoints associated with product-chemical combinations within product categories based on pressing public health or ecological health concerns. The range of human health endpoints includes, among others, carcinogenicity, developmental toxicity, reproductive toxicity. Commonly considered environmental hazard traits include animal or plant toxicity. The California OEHHA has defined the breadth of endpoints and hazard traits for the SCP regulation (Division 4.5, Title 22, California Code of Regulations Chapter 54, §69401 et seq.).

2) Route of Exposure Approach

By their nature, certain products provide direct routes of exposure to consumers during the product's normal use. For instance, products intended to generate vapors, fragrances, or odors are readily inhaled and can become especially problematic if they contain toxic chemicals. This approach considered how products are used, the frequency and quantity of use, and where the products are used as factors to assess the propensity for exposure to the chemical from the product's use.

3) Chemical Prioritization Approach

We considered that there might be certain Candidate Chemicals having multiple hazard traits and/or environmental or toxicological endpoints which could be found in a variety of consumer products. One reasonable approach for screening might be to identify potential product categories based on the presence of one of these chemicals.

4) Evidence of Exposure Approach

Evidence of exposure can be demonstrated using results from several types of monitoring. Household dust studies, biomonitoring studies, indoor media surveys, or environmental monitoring – in water, sediment or in biota tissue – provide such evidence. These direct measures of a chemical's presence facilitate our evaluation of

potential exposures from products known to contain identified chemicals. Note that although these studies document the presence of chemicals, they do not necessarily identify the source of the exposure.

5) Sensitive Subpopulation Approach

We considered product categories relevant to certain sensitive subpopulations as defined in the SCP regulations. Sensitive subpopulations include infants, children, pregnant women, and elderly and other individuals at greater risk of adverse health effects when exposed to chemicals. Workers are also considered to be a sensitive subpopulation because they may be subject to frequent or prolonged exposures to chemicals due to the nature of their occupation.

6) Functional Use Approach

The functional use approach recognizes that many chemicals are used in a wide variety of products due to similar physical, chemical, and functional requirements of the products. The functional use approach groups chemicals and/or products that perform similar functions, such as bonding, disinfecting, suppressing flames, or cross linking for consideration. Thus, evaluating through this filter may identify different categories of products with very similar concerns regarding hazard characteristics, potential exposure, or impacts.

7) Existing Research/Nomination Process Approach

We received many nominations of product-chemical combinations during the Initial Priority Product selection process. The majority of these nominations consisted of expert elicitations from scientists at the various CalEPA Boards, Departments, and Offices, and from other California agencies; some of these nominations were elicited from academic scientists, businesses, and NGOs. A number of nominated products were researched extensively but were not included in the proposed Initial Priority Products List. Some product categories were included so that we might pursue these previously-nominated products.

Priorities

We selected categories in this Work Plan after considering the information generated using the various screening approaches in conjunction with the many factors identified in the SCP regulations.

We prioritized product categories with the following attributes:

- Product categories with products with clear pathways for dermal, ingestion or inhalation exposure
- Product categories with chemicals found in biomonitoring studies
- Product categories with chemicals observed in indoor air quality studies
- Product categories that include product-chemical combinations that impact sensitive subpopulations
- Product categories that contain chemicals that have aquatic resource impacts and/or which have been observed through water quality monitoring

4.0 PRODUCT CATEGORIES AND CLASSIFICATIONS

The Work Plan identifies product categories and classifications that are consistent, to the extent practical, with the Global Product Classification (GPC) system (<http://www.gs1.org/gdsn/gpc>). There are numerous national and international product classification systems, each with a differing purpose and use. We have chosen to align product categories as closely as possible to the GPC system to provide a clear and consistent convention for the identification or classifications of products across industry sectors and throughout supply chains. By referencing this widely recognized classification system, we hope to provide clear market signals to manufacturers of products contained in the categories identified.

There are some product categories within the GPC that are too broad to provide the clarity and specificity required for identifying the types of products DTSC will evaluate further. In those instances, we chose to narrow the scope by including and defining the types of products that will be evaluated within each product category. It is also important to note that some product categories that might be of interest do not exist within the GPC. Specifically, the GPC does not include a product category for children, who are a priority sensitive subpopulation for this Work Plan. Instead, children's products are included as subsets of the other products – based on whom the product is marketed for. For example, a personal care or hygiene product intended and marketed for a child under the age of 12 would be included within the “Beauty/Personal Care/Hygiene” category. Special attention will be given within product categories, as needed to address potential impacts to children. As we implement the Work Plan, each category identified will be further researched, refined and narrowed through research, stakeholder dialogue, and discussion.

Product Categories of Interest

The subsequent sections provide a brief description of each of the Product Categories, including some of the Candidate Chemicals which may be of interest for further evaluation during implementation of the Work Plan. Some of the uses of these Candidate Chemicals are also included. **Identification of specific example Candidate Chemicals does not mean that DTSC may not consider other chemicals for prioritization in a product-chemical combination.**

4.1 Beauty, Personal Care and Hygiene Products

This category includes products designed to be applied to, or used on, the body to satisfy all types of health and beauty needs. Examples include hair care products, skin care products, personal hygiene products, and cosmetics. Examples of products included in this product category are:

- body wash & soaps
- deodorants
- lip balms & gloss
- lotions
- ointments
- pomades
- hair care products
- cosmetics
- nail care products

According to surveys, a typical person may use nine or more personal care products each day, some several times a day. Products in this category are typically formulated with multiple ingredients, each added for a specific purpose. In addition to chemicals associated with a product's primary use, these products often include fragrances, colorants, stabilizers, preservatives, and emulsifiers. Some of these ingredients are Candidate Chemicals.

The cosmetics subcategory, one of many subcategories, illustrates the very large number of products of potential interest. As of the end of 2011, the CDPH Safe Cosmetics Program database included over 17,000 products that contained one or more chemicals that appear on California's Proposition 65 list of carcinogens and reproductive toxicants. These products were reported by 700 unique manufacturers and included 96 different listed chemicals. Cosmetics is only one of the dozens of subcategories of beauty, personal care, and hygiene products. The number of subcategories that could potentially expose people and wildlife to Candidate Chemicals is likely significantly higher.

Using beauty, personal care, and hygiene products involves applying them to the body. Some (e.g., soap or shampoo) are designed to be rinsed off soon after they are applied but others—like lotions, makeup, and hairspray – are designed to be left on the hair or skin and may be reapplied throughout the day, resulting in prolonged or repeated exposures to their chemical ingredients. Some chemicals in these products can be absorbed through the skin including the scalp. In addition to skin exposure, some products in this category also generate vapors or mists that can be inhaled.

Many beauty, personal care, and hygiene products are washed down drains, either as part of their normal use or when people wash their hands, faces, hair, and bodies. Some chemicals in these products pass through wastewater treatment plants untreated, finding their way into sewage sludge, rivers, lakes, and/or the oceans, where they can expose, and potentially harm, the environment.²

Determining the chemical composition of beauty, personal care, and hygiene products can be a challenge. While manufacturers of these products often provide a list of chemical ingredients on the package label, they are not required to disclose certain ingredients, including fragrances, and flavors. In other cases, a manufacturer that is required to provide notification that their products expose users to hazardous chemicals may fail to do so. In January 2012, California's Attorney General settled a lawsuit with the manufacturer of Brazilian Blowout hair straightening products for failing to disclose that the products release formaldehyde gas, a carcinogenic chemical, during application.

Industry, the general public, and regulators have become increasingly concerned about potential exposure to hazardous chemicals from beauty, personal care, and hygiene products and some have taken actions to limit the use of certain chemicals or increase awareness of the chemical ingredients. A small study by DTSC in 2011 of nail products claiming to be free of formaldehyde, toluene, and dibutyl phthalates raised concerns about accurate ingredient disclosure³. To help nail salon customers make informed choices, California's Healthy Nail Salon Collaborative has partnered with local governments in several California regions—Alameda County, San Francisco, San Mateo County, and Santa Monica—to recognize nail salons that use safer products and practices. At the national level, H.R.4250, the Sunscreen Innovation Act passed the U.S. House of Representatives in July 2014. It is intended to facilitate more sunscreen ingredient disclosure.

Consumers who apply beauty, personal care, and hygiene products directly to their bodies are not the only people who may be exposed to the ingredients. Hair and nail salon workers, who are often women of child-bearing age, spend many hours per week working with these products. Many workers in this sector are

² Kinney, C.A., Furlong, E.T., Zaugg, S.D., Burkhardt, M.R., Werner, S.L., Cahill, J.D., Jorgensen, G.R (2006). Survey of Organic Wastewater Contaminants in Biosolids Destined for Land Application. *Environ. Sci. Technol.* 40: 7207-7215

³ http://www.dtsc.ca.gov/PollutionPrevention/upload/NailSalon_Final.pdf

potentially impacted; Statistics from the California State Board of Barbering and Cosmetology, for June 2011, indicate there were approximately 121,000 full-time licensed nail technicians and 284,000 cosmetologists working in California.

A combination of factors prompted our decision to choose beauty, personal care, and hygiene products:

- The products are designed to be applied to the body, directly exposing users to whatever chemicals they contain.
- Chemical ingredients are sometimes not disclosed on product labels. This impedes consumers' ability to make informed decisions to avoid certain chemicals and makes it difficult for workers to know what practices to follow to protect themselves from chemical exposure.
- Some of the chemical ingredients are known to be hazardous to people and wildlife.
- Some chemicals used in these products have been detected in humans in biomonitoring studies, although whether or not the source is personal care products is usually unknown.
- These chemicals may pass through wastewater treatment plants and can expose wildlife.
- This Work Plan category will enable DTSC to use information that others have compiled to challenge manufacturers to find safer alternatives.

Table 1 identifies several possible candidates that may be evaluated as we work to identify Priority Products from this category. The example chemicals in the table are not intended as a comprehensive list of Candidate Chemicals in this product category. Any Candidate Chemical could be considered as we evaluate our product categories.

Table 1 Potential Candidate Chemicals in Beauty, Personal Care and Hygiene Products

Chemicals or Chemical Classes	Functional Use
Aldehydes, formaldehyde	Cross-linking agent, modifier, preservative
Alkyl phenols & ethoxylates	Surfactant
Azo dyes, coal tars, lead, and lead acetate	Colorant, dyes, pigment
Phthalates	Emulsifier, plasticizer
Triclosan	Antimicrobial
Toluene	Solvent

4.2 Building Products and Household, Office Furniture and Furnishings

In this section we discuss two distinct product categories together because when considered together, they encompass so much of our indoor environment – both constructed and furnished. These two categories raise similar exposure concerns (e.g., both include products whose chemical ingredients can concentrate in indoor air) and have considerable overlap in their respective use of Candidate Chemicals. A general discussion of the

concerns that are common to both categories is provided, followed by brief discussions defining each of the categories.

Both categories—building products and furnishings—encompass wide ranges of products used by virtually everyone. We have limited the scope of these two categories as follows:

- Building Products: this category is limited to paints, adhesives, sealants, and flooring.
- Furnishings: this category is limited to home and office furnishing products that are treated with flame retardants or stain resistant chemicals or both.

According to a U.S. EPA estimate, people spend up to 90 percent of their time indoors. That means that if products used to build and furnish our indoor working and living spaces contain potentially hazardous chemicals, long term exposure can occur. Exposure can occur as we breathe chemicals that are emitted from products into the air, or when we absorb chemicals through the skin from direct contact with buildings and their furnishings. Normal wear and tear can degrade building materials and furnishings and create dust. Young children often touch floors or furniture and then put their hands in their mouths, resulting in direct ingestion of dust and the many chemical contaminants that dust has been documented to contain. Flame retardants, stain repellants, plasticizers, phenols and metals have been found in indoor dust studies.

Flame retardants are of particular concern as they have been associated with endocrine disruption and reproductive, neurologic, and immune impairment as well as cancer. Chemicals that provide stain resistance for fabrics are highly persistent in the environment and some are carcinogenic. Monitoring studies provide evidence of exposure and absorption of these chemicals. More than 50 Candidate Chemicals have been detected in one or more dust studies. Studies by researchers at Duke University found brominated and organophosphate flame retardants in furniture foam and house dust.

Human biomonitoring studies, which identify human exposure by measuring environmental chemicals in human tissues and fluids such as blood and urine, confirm that the chemicals found in dust studies can be found in the body. Biomonitoring studies have found high levels of seven different forms of PBDE flame retardants –all of which are Candidate Chemicals – in blood samples taken from California children^{4,5}.

An added concern for flame retardants and stain repellants is the potential movement to regrettable substitutes. As concern over older classes of these chemicals (e.g., brominated flame retardants, perfluorooctanoic acid) has grown, newer flame retardants and stain repellants have been developed whose toxicology is, as yet, not as well understood. The SCP regulations' Alternatives Analysis framework will reduce the likelihood that regrettable substitutes will be used.

⁴ Rose, M, DH Bennett, A Bergman, B Fangstrom, IN Pessah and I Hertz-Picciotto. 2010. PBDEs in 2- 5-year-old children from California and associations with diet and indoor environment. *Environmental Science and Technology*. 2010 Apr 1;44(7):2648-53 <http://dx.doi.org/10.1021/es903240g>.

⁵ Windham, GC, SM Pinney, A Sjodin, R Lum, RS Jones, LL Needham, FM Biro, RA Hiatt and LH Kushi. Body burdens of brominated flame retardants and other persistent organo-halogenated compounds and their descriptors in U.S. girls. *Environmental Research Environmental Research Volume 110, Issue 3, April 2010, Pages 251–257* <http://dx.doi.org/10.1016/j.envres.2010.01.004>

In a new, well-built house, it takes nearly three hours to fully exchange the indoor air.⁶ As a result, volatile and semi-volatile chemicals released from building and home furnishing products can build up in indoor air to levels much higher than found outdoors. This makes the release of volatile organic compounds from products into indoor air a significant concern. Semi-volatile chemicals applied to products are not chemically bound, but are sprayed onto the materials afterward. Unlike volatile compounds, semi-volatile chemicals are released much more slowly and endure much longer indoors as vapor or airborne particles that tend to stick to surfaces or settle in dust. Indoor air studies document that a wide range of chemicals – including many Candidate Chemicals- can be found in most homes⁷.

Workers who construct our offices, schools, homes, and institutions have a high potential for exposure to hazardous chemicals in building products. Organic solvents and other volatile chemicals are released from paints, varnishes, coatings, adhesives, and other construction materials as they are applied. While these chemical vapors ultimately dissipate, they can become concentrated in indoor air while, and immediately after, the products are used. Workers are at increased risk for exposure because they may use these products frequently and for extended periods of time in indoor environments with low air circulation.

A combination of factors gives both building products and home furnishing products a high likelihood of exposing people to hazardous chemicals.

- Products in these categories are used by virtually all members of society.
- These products contain a wide range of chemical ingredients, including Candidate Chemicals with known hazard traits.
- Use of the products indoors, where air exchange is slow, causes longer exposures to higher levels of certain Candidate Chemicals, especially since people spend 90% of their time indoors.
- People who work regularly with building products face even higher risk of exposure.
- Toddlers have been shown to have direct exposure to chemicals from these product categories due to the fact that they crawl on the floor and put their hands in their mouths, thereby ingesting house dust.
- Flame-retardant and stain-resistant Candidate Chemicals used in home furnishings have been detected in household dust and in human biomonitoring studies.
- The incidence of childhood asthma has increased significantly in recent decades and Candidate Chemicals that cause or worsen asthma are found in building products.

4.2.1 Building Products: Paints, Adhesives, Sealants, and Flooring

This product category does not encompass all products used to construct buildings. Instead, it focuses on select subcategories namely paints, adhesives, sealants, and flooring.

⁶ <http://www.cpsc.gov/en/Safety-Education/Safety-Guides/Home/The-Inside-Story-A-Guide-to-Indoor-Air-Quality/> , retrieved August 11, 2014.

⁷ J. M. Logue, T. E. McKone, Hazard assessment of chemical air contaminants measured in Residences, *Indoor Air* 2011; 21: 92–109

Examples of building materials in this category include:

- adhesives & glues
- carpeting
- caulking
- engineered wood
- paints & primers
- paint and graffiti removers & cleaners
- plywood subfloors
- compressed wood flooring products
- roof coatings
- sealants
- stains & varnishes
- vinyl flooring

Table 2 lists several of the many Candidate Chemicals that can be found within the Building Products category. Note that any Candidate Chemical could be considered as we evaluate our product categories to identify Priority Products.

Table 2 Potential Candidate Chemicals in Building Products

Chemicals or Chemical Classes	Functional Use
Brominated or chlorinated organic compounds, organophosphates	Flame retardant
Isocyanates	Reactant, precursor
Metals, such as Chromium VI	Dyes & Pigment
Perfluorinated Compounds	Repellent (water-, oil-, stain-)
Phthalates	Plasticizer
Volatile Organic Compounds, such as formaldehyde, n-hexane, n-methyl-pyrrolidone, toluene	Solvent

4.2.2 Household, Office Furniture and Furnishings

This product category does not encompass all furnishing products; rather we will focus on furnishings treated with flame retardant and stain resistant chemicals. Household, Office Furniture and Furnishings includes fabric/ textile furnishings and furniture products. Examples of furnishings in this category include

- Bedding
- Fabric & textile furnishings
- Seating/Sofas

In contrast to other tables of potential Candidate Chemicals found in this Work Plan, we do not intend to consider chemicals other than flame retardants or perfluorinated compounds as we evaluate this category (Table 3).

Table 3 Potential Candidate Chemicals in Household, Office Furniture and Furnishings

Chemicals or Chemical Classes	Functional Use
Chlorinated and brominated organic compounds, organophosphates	Flame retardant
Perfluorinated Compounds	Repellent (water-, oil-, stain-)

4.3 Cleaning Products

Cleaning products are ubiquitous, and people may be exposed to chemicals in these products both during and after use. These products are formulated using chemicals that improve the performance of these cleansers, but often these same chemicals can also harm people and/or our environment. People may get cleaning products directly on their skin or in their eyes, or they can inhale their vapors. Exposure to chemicals such as strong acids or bases in cleaning products can cause skin rashes, severe burns, or asthma attacks. Other Candidate Chemicals in some cleaning products are endocrine disruptors, reproductive toxicants, or neurotoxicants.

Those who use cleaning products at work have higher exposures. According to the National Institute of Occupational Health Sciences (NIOSH), 2.3 million people work in building custodial services occupations in the U.S., and another 1.4 million work as maids in hotels, or in healthcare facilities. NIOSH has made it a priority to support ongoing research to help cleaning professionals recognize and prevent or reduce risks at work.⁸ The CDPH has published reports and factsheets on work-related asthma among workers exposed to cleaning products.⁹

After use, the volatile chemicals in a cleaning product may affect indoor air quality. As cleaning products are washed down the drain, some emerging contaminants are not intentionally treated by wastewater treatment plants and inadvertent chemical or biological reactions can lead to harmful degradation products. In the case of triclosan, dioxin-like compounds, chloroform and other carcinogenic or cytotoxic chemicals result – some of which are highly persistent.¹⁰

Cleaning Products includes general cleaners, air fresheners and deodorizers, laundry detergents, and various surface cleaners. These products are used in homes, schools, hospitals, restaurants, hotels, offices, and other indoor and outdoor environments. Examples of products included in this product category are:

- Air fresheners
- Floor cleaners
- Oven cleaners

⁸ <http://www.cdc.gov/niosh/topics/cleaners/> Accessed August 14, 2014.

⁹ <http://www.cdph.ca.gov/programs/ohsep/Pages/Asthma.aspx> Accessed August 14, 2014.

¹⁰ Klosterhaus, S., R. Allen, and J. Davis. 2011. Contaminants of Emerging Concern in the San Francisco Estuary: Triclosan and Triclocarban. A Report of the Regional Monitoring Program for Water Quality in the San Francisco Estuary. SFEI Contribution #627. Final Report. San Francisco Estuary Institute, Oakland, CA.

- Bathroom cleaners
- Carpet cleaners
- Detergents
- Floor waxes
- General-purpose cleaners
- Scouring cleaners
- Spot removers
- Window cleaners

Both consumers and manufacturers have become increasingly aware of the problems that can be associated with chemicals in cleaning products. Consumers have embraced product lines with less hazardous chemicals. At the same time more and more manufacturers seek to develop and market products that are safer. The fragrance industry has voluntarily moved to restrict the use of numerous hazardous chemicals used in fragrances. Still, there are thousands of chemical compounds used in fragrances, some of which have hazards traits that may warrant further investigation. In selecting Cleaning Products, the Department will be able to encourage further adoption of safer chemicals in this market sector.

Table 4 lists several of the many Candidate Chemicals that can be found within the Cleaning Products category. Note that any Candidate Chemical could be considered as we evaluate our product categories to identify Priority Products.

Table 4 Potential Candidate Chemicals in Cleaning Products

Chemicals or Chemical Classes	Functional Use
Alkyl phenol and ethoxylates	Surfactant
Hydrogen Fluoride	Anti-scaling agent
Phthalates	Emulsifier
Triclosan	Antimicrobial
Volatile Organic Compounds, such as n-hexane, methyl ethyl ketone, n-methyl-pyrrolidone, toluene, and xylene	Solvent

4.4 Clothing

This product category includes fiber and textile materials worn on the body with the primary function of covering the body and/or providing protection against the elements. Examples of products included in this product category are:

- Full body wear
- Lower body wear
- Sleepwear
- Sportswear
- Underwear
- Upper body wear

The number and variety of types of clothing in the market are enormous. U.S. retail clothing sales exceeded \$300 billion in 2009. Based on California Board of Equalization records, taxable sales of Clothing and Clothing Accessories in 2012 were approximately \$26 billion. Clothing is the fourth largest taxable commodity in California after motor vehicles & gasoline, general merchandise, and taxable food services. Modern clothing and textiles are engineered to have qualities that buyers demand, among them color fastness, wrinkle resistance, stain resistance, and water repellency. Manufacturers achieve these properties by adding a variety of chemicals during the manufacture of clothing, including surfactants, dyes, paraffins, metals, perfluorinated compounds, formaldehyde, and phthalates. Many of these chemicals are toxic, bioaccumulative, or environmentally persistent and appear on DTSC's Candidate Chemicals list.

Textile and clothing manufacturing use large quantities of water, most of which is ultimately discharged as wastewater. Excess, unreacted chemicals in this wastewater are discharged into water bodies, where they can harm aquatic organisms. Over a product's lifetime, chemicals continue to be released from finished clothing as it is laundered.^{11, 12} Wastewater treatment plants typically have not been designed to treat emerging contaminants so in some cases, chemicals pass untreated into the environment. During or after treatment, some chemicals may degrade into harmful degradation products, some of which may persist and can have effects on aquatic life throughout the food web.

DTSC's identification of this product category builds on work already undertaken by the clothing and textile industry to reduce their use of toxic chemicals. Industry leaders have acknowledged the need for manufacturers to be aware of chemical safety and are actively working to restrict the use of certain chemicals. To this end, they have developed "restricted substances lists" (RSLs). These lists level the playing field for proactive, responsible manufacturers by providing consistent information on chemical substances that are banned or restricted in clothing and textiles by various jurisdictions. Industry RSLs have already led to reductions in the use of the stain-repellant chemical perfluorooctanoic acid (PFOA), which is very persistent in the environment, as well as surfactants known as nonylphenol ethoxylates (NPEs), which are highly toxic to fish, as well as to aquatic invertebrates and plants. Despite the existence of RSLs, PFOA, NPEs, and other Candidate Chemicals continue to be used in clothing.

¹¹ Swedish Chemicals Agency, 2012. Antibacterial substances leaking out with the washing water—analyses of silver, triclosan and triclocarban in textiles before and after washing

¹² Environment Agency, 2013. Nonylphenol ethoxylates (NPE) in imported textiles

Table 5 Potential Candidate Chemicals in Clothing Products

Chemicals or Chemical Classes	Functional Use
Alkyl phenol & ethoxylates	Surfactant
Aromatic amines and azo dyes	Colorant, Dye, Pigment
Chlorinated paraffins, halogenated compounds, and organophosphates	Flame retardant
Perfluorinated Compounds, formaldehyde	Repellent (water-, oil-, stain-, wrinkle-)
Phthalates	Plasticizer
Triclosan	Antimicrobial agent, Material Preservative

4.5 Fishing and Angling Equipment

Recreational anglers fish in sensitive habitats like lakes, rivers, streams, bays, and the ocean. More than two million Californians fish recreationally. Together, these anglers may lose hundreds of tons of fishing and angling equipment into the environment. The hazardous chemicals in the equipment they lose can expose, and potentially harm, birds and other wildlife. Products in this category contain a variety of chemicals that appear on the Candidate Chemicals List, including metals such as lead, zinc, and copper. Of particular concern are products such as fishing weights and sinkers made from lead that are used to add weight to a fishing line, lure or hook.¹³ Lead poisoning associated with the ingestion of lead fishing weights has been well documented in a variety of bird and animal species around the world, including swans, waterfowl, gulls, turtles, cranes, herons, pelicans, and others.

Examples of products included in this product category are:

- Fishing weights & gear

Table 6 Potential Candidate Chemicals in Fishing and Angling Equipment

Chemicals or Chemical Classes	Functional Use
Metals	Strength Density

¹³ Lead Fishing Sinkers; Response to Citizens' Petition and Proposed Ban; Proposed Rule, U.S. Environmental Protection Agency, Federal Register, Volume 59, Number 46, Wednesday, May 9, 1994. <http://www.gpo.gov/fdsys/pkg/FR-1994-03-09/html/94-5298.htm>

4.6 Office Machinery (Consumable Products)

This product category includes consumable and refillable components of office machinery (e.g., cash registers, credit card terminals, printers, and photocopiers) that must periodically be refilled or replaced because they have been depleted or worn out. Examples of products in this category include:

- Printer inks
- Specialty paper
- Toner cartridges

Products in this category are widely used in offices, retail stores, and homes. They contain a range of Candidate Chemicals, including azo-dyes (some of which are carcinogenic to humans and acutely toxic to aquatic life), bisphenols (possible developmental toxicants), and phthalates. These chemicals can also be transferred to printed documents produced by office machinery. People can be exposed to Candidate Chemicals when they replace consumable products or when they handle printed documents. People who eat or smoke after handling office machinery consumable products or documents may also ingest Candidate Chemicals. Workers who use office machinery daily, throughout the course of the day have the highest potential for chemical exposure from consumable office products.

Consumable products for office machinery also have the potential to release Candidate Chemicals to the environment.

Table 7 Potential Candidate Chemicals in Office Machinery (Consumable Products)

Chemicals or Chemical Classes	Functional Use
Azo dyes	Colorants
Bisphenols	Developer
Phthalates	Stabilizer, plasticizer
Volatile Organic Compounds, such as benzaldehyde, hexanol, toluene, and xylene	Solvents

5.0 CONCLUSIONS

We have identified seven diverse product categories for consideration over the coming three years.

Table 8 summarizes the product categories DTSC has selected and types of products that are included under each of those categories.

Table 8 Product Categories and Subcategories

Beauty/Personal Care/Hygiene	Clothing
Skin Products Personal Hygiene Products Hair Products Cosmetics/Fragrances	Full Body Wear Lower Body Wear/Bottoms Sleepwear Sportswear Underwear Upper Body Wear/Tops
Building Products	Household/Office Furniture/Furnishings
Flooring Painting Sealants/Fillers/Adhesives	Bedding Fabric/Textile Furnishings Household/Office Seating
Cleaning Products	Office Machinery Consumable Products
Fresheners/Deodorizers Cleaners Laundry Surface Care	Inks and Toners Specialty Paper
Fishing and Angling Equipment	

We believe that within these categories there are products that contain Candidate Chemicals and may have the potential for widespread adverse impact in California. In examining these product categories we will consider a wide range of potential impacts related to human health and ecology. Identification of these categories provides a preliminary level of regulatory certainty for manufacturers. At the same time, this Work Plan will allow us to respond to health concerns being raised by academic researchers, public health organizations, NGOs, and the greater public. We believe that through implementation of this work plan, we will raise awareness among California's consumers about potential harm in certain products on the market.

Publication of this Work Plan is not an end – it is a beginning. Priority Products will be identified from these categories only after stakeholder engagement, information exchange with industry experts, and robust scientific review. Public workshops, data call-ins, and extensive research will be used to identify potential Priority Products.

The SCP regulations outline a measured, considered approach to identifying and reviewing possible alternatives to Priority Products. A limited number of Priority Products will be identified over the next three

years, likely no more than ten per year. Each Priority Product selected from the categories will follow the regulatory framework established through the collaborative efforts of manufacturers, retailers, consumers, scientists and environmentalists. Continued engagement with all our stakeholders will enable us to successfully implement these regulations. The framework calls for several steps subsequent to the nomination of a Priority Product:

Regulations Any Priority Products identified from these product categories will be adopted into regulation following the Administrative Procedure Act process including public comment periods.

Alternative Analysis Manufacturers will follow the Alternative Analysis process to identify safer product designs or alternative formulations which meet product requirements.

Regulatory Response DTSC will issue an appropriate regulatory response if warranted. The seven possible regulatory responses named in regulation are as follows:

1. Imposing requirements to provide additional information needed to assess a chemical of concern and its potential alternatives;
2. Imposing requirements on the labeling or other type of consumer product information;
3. Imposing a restriction on the use of the chemical of concern in the consumer product;
4. Prohibiting the use of the chemical of concern in the consumer product;
5. Imposing requirements that control access to or limit exposure to the chemical of concern in the consumer product;
6. Imposing requirements for the manufacturer to manage the product at the end of its useful life, including recycling or responsible disposal of the consumer product; and
7. Imposing a requirement to fund green chemistry challenge grants where no feasible safer alternative exists.

As groundbreaking as this regulatory approach is, it is part of a paradigm shift in the manufacturing sector toward safer ingredients. We will encourage this trend and advance other aspects of green chemistry in California. We will support the education of chemists steeped in the principles of green chemistry. Over the next three years we anticipate the emergence of new chemicals in commerce, new toxicological methods, and new scientific tools to address or close data gaps. We anticipate and will encourage wider adoption of green chemistry approaches to product development. We believe these are the next necessary steps toward the development of a green economy in California in the tradition of this state's long history of innovation.

6.0 APPENDIX - Acronyms

CalEPA	California Environmental Protection Agency
CDPH	California Department of Public Health
DTSC	Department of Toxic Substances Control
GPC	Global Product Classification
GRSP	Green Ribbon Science Panel
H.R.	House of Representatives
NGO	Non-governmental organization
NIOSH	National Institute of Occupational Health Sciences
NPE	Nonylphenol ethoxylate
OEHHA	Office of Environmental Health Hazard Assessment
PBDE	Polybrominated diphenyl ether
PFOA	Perfluorooctanoic acid
RSL	Restricted Substances Lists
SCP	Safer Consumer Products
U.S. EPA	U.S. Environmental Protection Agency