DecaBDE and NPE Alternatives Analysis Pilot Project

March 2014

Agenda

- Introductions
- Pilot AAs
  - Cases
    - DecaBDE/computer housings
    - NPE/general purpose surfactants
  - Timeline
  - High level DecaBDE report review
  - Comment period on pilot reports

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Alternatives Analysis Pilot Project

Purpose: Gain useful experience to inform public comments on SCP regs and guidance documents by completing an Alternatives Analysis that meets requirements of Article 5

-- NOT LEGAL ADVICE --

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Selected BizNGO Cases: Criteria for Selecting Cases

- Two types of products: formulated product and article
- Different environmental/human health concerns
- Cases with available data
  - US EPA DfE AAs: DecaBDE and NPE
    - Note: these are hazard assessments only
- Cases with successful substitutions
  - Viable alternatives on the market and in use by companies
- Demonstrate what's possible when data are rich
- Process focused (rather than content)

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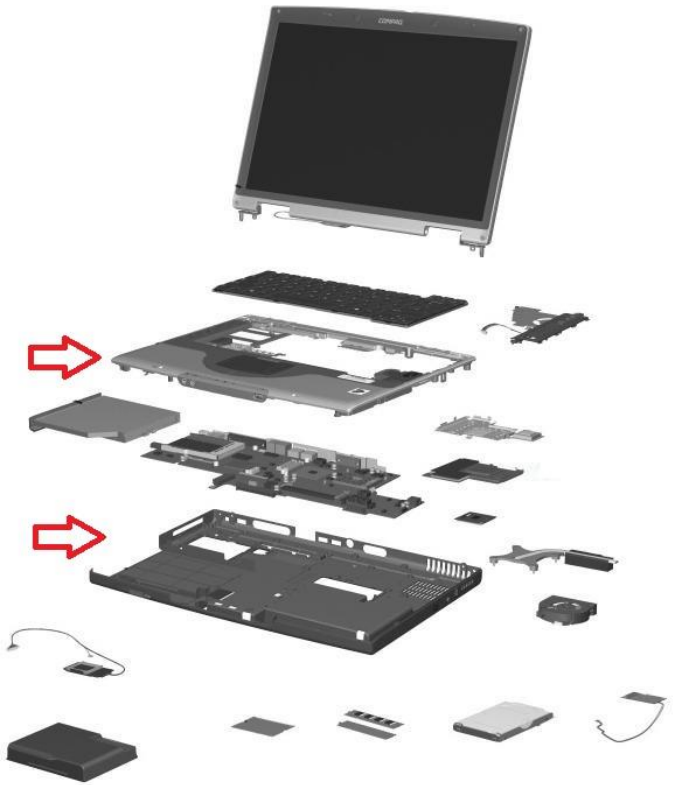
DecaBDE

Priority Product / Chemical of Concern

- Electronics enclosures containing decaBDE
- "Electronics enclosures" defined as the external housings of electronic products
- An Alternatives Analysis Threshold of 0.01%wt applies to the homogenous plastic material(s) comprising the enclosure
  - Addresses recycled content with decaBDE
- Choice of decaBDE allowed team to draw from substantial existing work, including EPA and WA state
- DecaBDE is already restricted under EU RoHS



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NPE

Priority Product / Chemical of Concern

- All-purpose cleaners containing Nonylphenol Ethoxylates (NPE)
- "All-purpose cleaner" defined as one that works on multiple surfaces and accomplish many types of basic soil removal needs
- *No Alternatives Analysis Threshold selected for this pilot*
- Choice of NPE allowed team to draw from substantial existing work, including EPA

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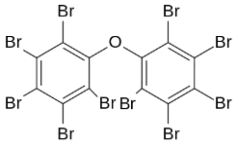
DecaBDE and NPE AAs

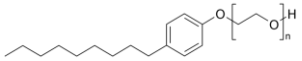
DecaBDE



Chairs: Cheri Peele and Cory Robertson

- **Multistakeholder** team
- Used **SCP structure and timeline**
- Functional use: **flame retardant**
- Is it necessary: yes, legal
- Key impact areas: life cycle breakdown products, PBT
- Life cycle concerns: environmental fate, burning of e-waste (dioxins)

NPE



Author: Eric Harrington

- Individual **consultant**
- Used **single report** structure
- Functional use: **surfactant**
- Is it necessary: yes, basic functionality of all-purpose cleaners
- Key impact areas: aquatic tox, endocrine, skin/eye, irritant
- Lifecycle concerns: environmental fate, degrades to NP (vPvB)

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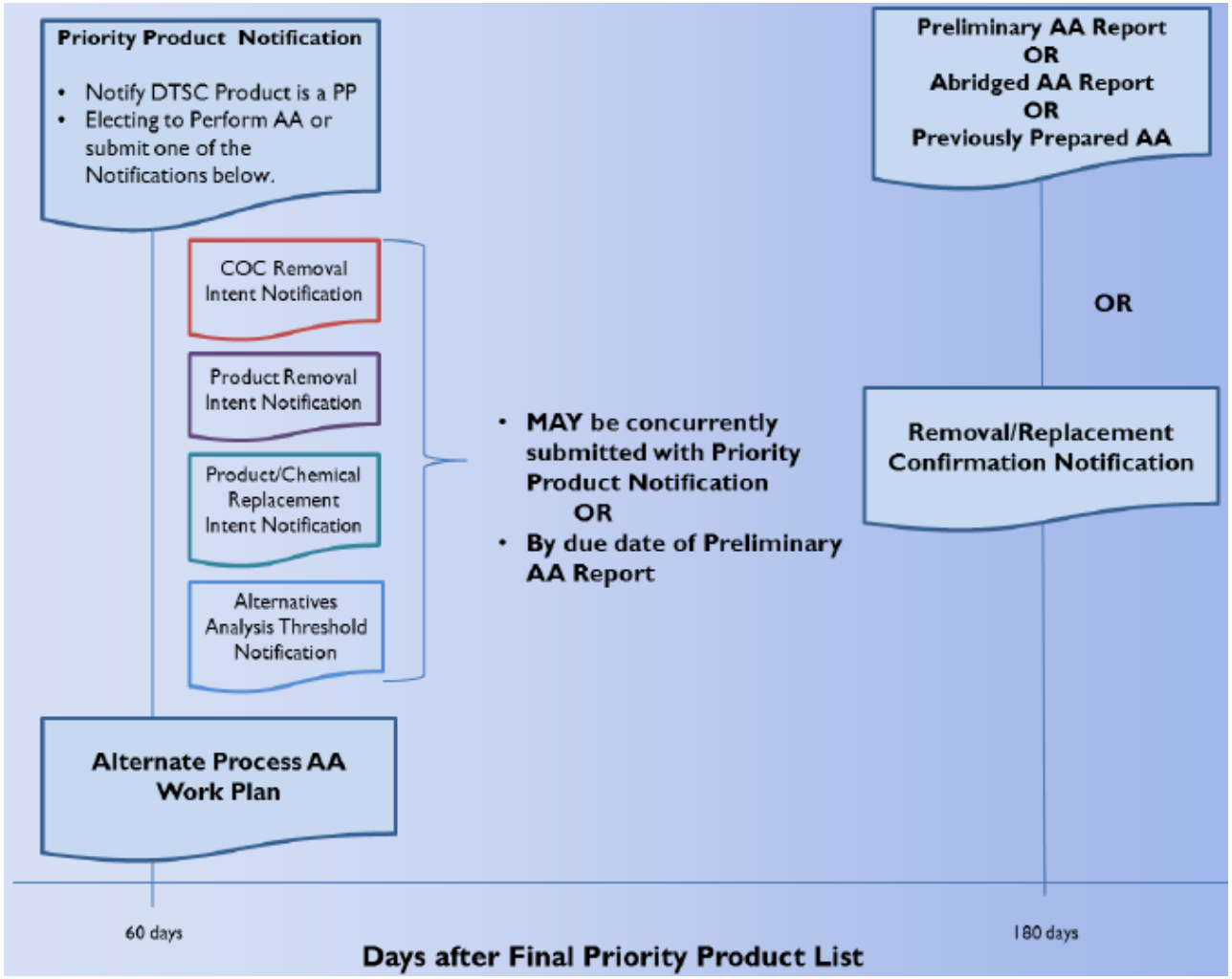
Stage 1 Alternatives Analysis Timeline



From: Lynn Goldman's presentation to the Green Ribbon Science Panel on 29 January 2014
http://www.dtsc.ca.gov/SCP/upload/GRSP-lgoldman.pdf

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DecaBDE Pilot Timeline

July 15, 2012 - Start of project

- Creation of a mock “notice” from DTSC

Jan 11, 2013 – Phase 1 due date

- 180 days to submit to “department”
- Submitted Dec 1, 2012 (early)

Feb 12, 2013 – “department” review

- 60 days from submission for “department” response (late)
- Got the equivalent of a “notice of deficiency”

  [challenging to correct Preliminary in 60d, as the process required, because regs were open for comment and had changed]

Note: AA portion only
(not other notifications)

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DecaBDE Pilot Timeline

March-April 2013

- Preliminary AA Report reformatted to new requirements
- Addressed comments from mock "department"
- Started Stage 2
- Continue to adjust Stage 1

July 2013

- Share interim findings and observations with DTSC

March 2014

- New working deadline for Phase 2 (Final AA Report)
- Posted final draft for submission to the "department"

Note: AA portion only
(not other notifications)

Pilot was able to meet timelines

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SCP ARTICLE 5

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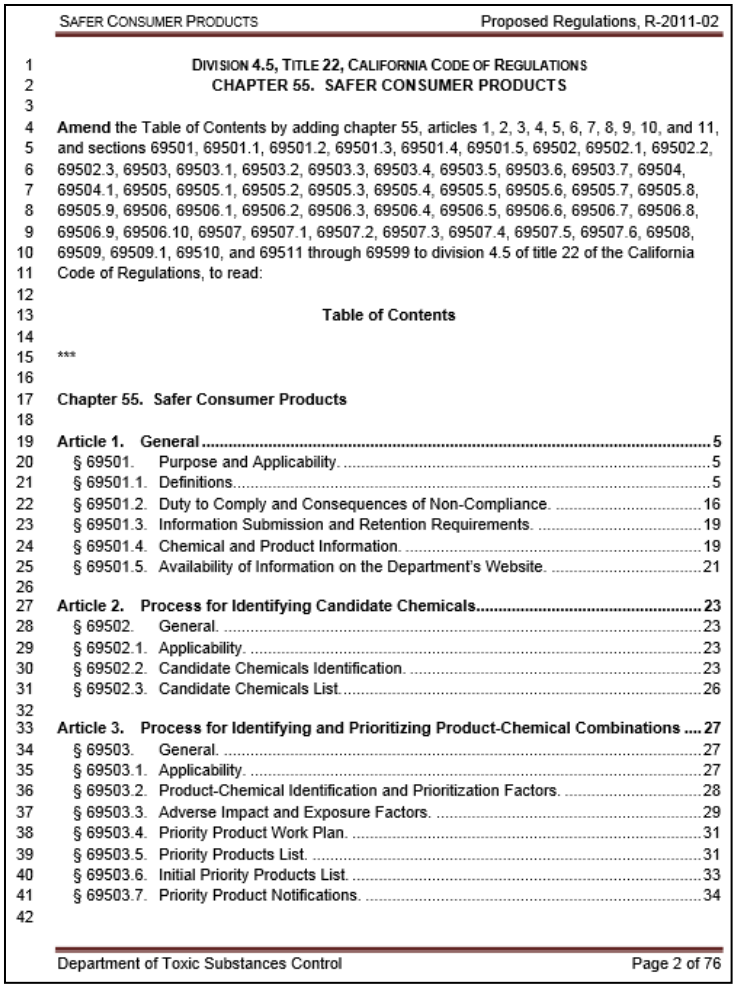
AA in Safer Consumer Products Regulations

If a Chemical of Concern is in a Priority Product:

- Alternatives assessment may be required
  - Highly prescribed analysis and documentation (Article 5)
- Assessment occurs BEFORE regulatory action
- Each "responsible entity" has to respond independently (like permit process)
- Can use consortia for the technical portion of AA



SAFER CONSUMER PRODUCTS — Proposed Regulations, R-2011-02

DIVISION 4.5, TITLE 22, CALIFORNIA CODE OF REGULATIONS
CHAPTER 55. SAFER CONSUMER PRODUCTS

Amend the Table of Contents by adding chapter 55, articles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11, and sections 69501, 69501.1, 69501.2, 69501.3, 69501.4, 69501.5, 69502, 69502.1, 69502.2, 69502.3, 69503, 69503.1, 69503.2, 69503.3, 69503.4, 69503.5, 69503.6, 69503.7, 69504, 69504.1, 69505, 69505.1, 69505.2, 69505.3, 69505.4, 69505.5, 69505.6, 69505.7, 69505.8, 69505.9, 69506, 69506.1, 69506.2, 69506.3, 69506.4, 69506.5, 69506.6, 69506.7, 69506.8, 69506.9, 69506.10, 69507, 69507.1, 69507.2, 69507.3, 69507.4, 69507.5, 69507.6, 69508, 69509, 69509.1, 69510, and 69511 through 69599 to division 4.5 of title 22 of the California Code of Regulations, to read:

Table of Contents

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Chapter 55. Safer Consumer Products

Department of Toxic Substances Control — Page 2 of 76

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First Stage of Alternatives Analysis

high level

Step 1
ID Product Requirements

- Function, performance, standards & legal requirements
- Function of Chemical of Concern
- Is the chemical necessary?
- Is replacement chemical necessary?

Step 2
ID* Alternatives

- Meet product requirements
- Reduce / eliminate CC
- Reduce / eliminate exposure
- Look at existing alternatives

Step 3
ID relevant factors

- Determine relevant hazards
- Compare alternatives
- Eliminate replacements with greater adverse impacts

Step 4
Prepare Report

- **Preliminary AA report**
- 180 days
- Work plan for 2nd Stage of AA process

*Should ID chemical substitutes AND other alternatives.

From: Lynn Goldman's presentation to the Green Ribbon Science Panel on 29 January 2014
http://www.dtsc.ca.gov/SCP/upload/GRSP-lgoldman.pdf

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Second Stage of Alternatives Analysis

high level

Step 1 – ID Relevant Comparison Factors

- In conjunction with exposure pathways & lifecycle phases
- Quantitative / qualitative analysis
- Available information

Step 2 – Compare Priority Product & Alternatives

- Quantitative / qualitative analysis
- Relevant factors
  - *exposure pathways*
  - *life cycle segments*
- Available information

Step 3 – Alternatives Selection Decision

- **Final AA Report**
- 1 year
- Reason & justification for decision

From: Lynn Goldman's presentation to the Green Ribbon Science Panel on 29 January 2014
http://www.dtsc.ca.gov/SCP/upload/GRSP-lgoldman.pdf

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DECA REPORT

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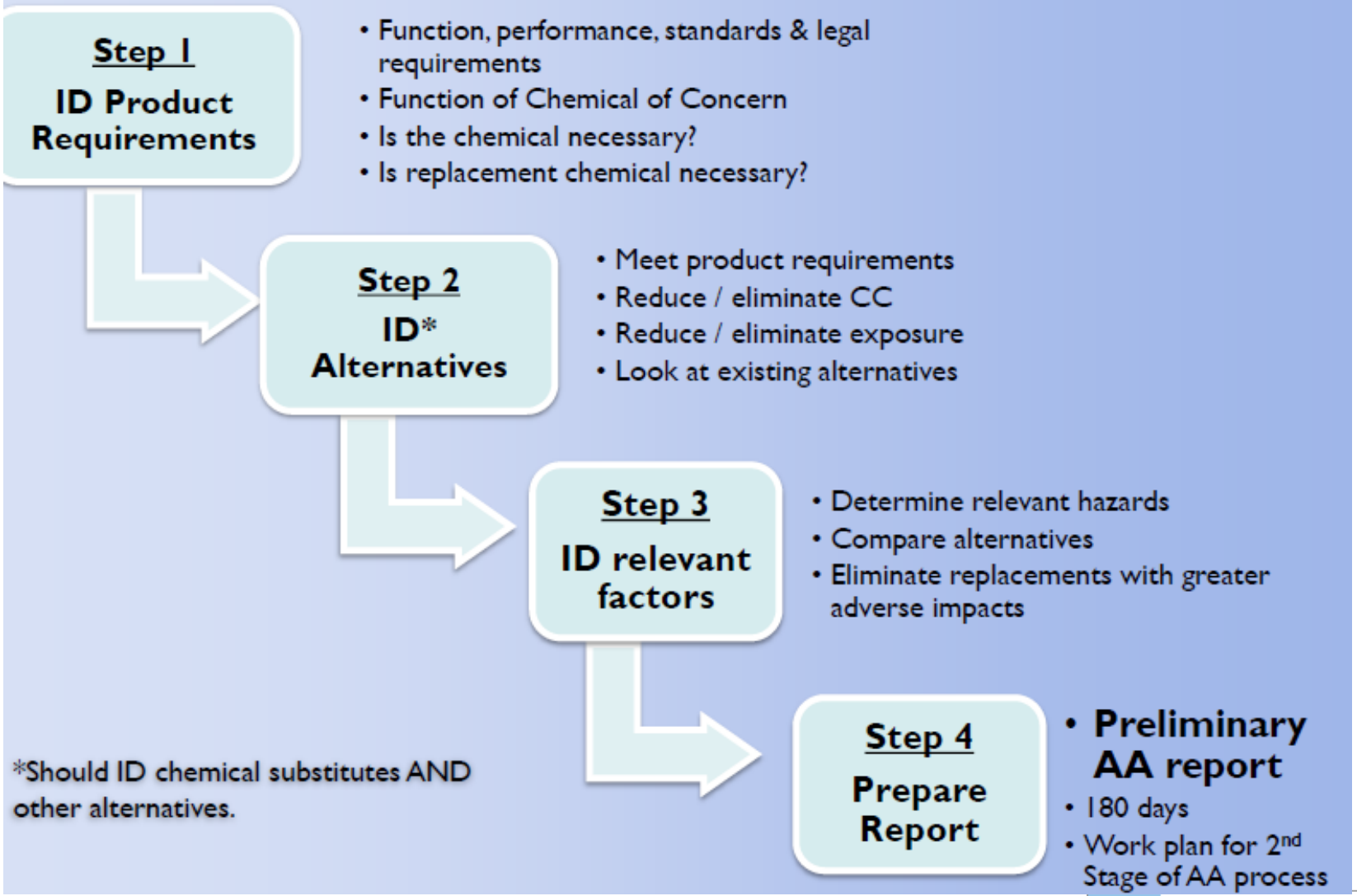
First Stage of Alternatives Analysis



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Stage 1 -> Preliminary AA Report

Preliminary AA Report content
is pre-defined in 69505.7:

(b) Executive Summary
(c) Preparer Info
(d) Responsible Entity Info
(e) Priority Product Info
(f) Relevant Factors
(g) Comparison of Alternatives
(h) Methodology/Tools
(i) Supporting Info
(j) Selected Alternative(s)
(k) Next Steps

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Table of Contents from Stage 1 Pilot Report

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Table of Contents from Stage 1 Pilot Report

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Stage 1 -> Preliminary AA Report

Priority Product Information (e)

- Functional requirements
- Performance requirements
- Legal requirements
- Role of chemical (is it necessary?)

-- Relatively easy --

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Stage 1 -> Preliminary AA Report

Identification of Alternatives

- Large number of alternatives (>100)
- Removed many from consideration
- 20 retained
- Documented reasons

-- Relatively easy --

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Stage 1 -> Preliminary AA Report

Identification of Relevant Factors

- Large number of factors
- Unclear how to substantiate decisions

-- Relatively hard --

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Relevant Factors Analyzed Only

A factor is relevant if:

- There is an exposure pathway in a particular life cycle segment
- The factor makes a material contribution to one or more adverse impact areas
- There is a material difference in the factor's impact between alternatives

GOOD = Don't have to reconsider Stage 1 factors in Stage 2

BAD = Burden of proof for relevance UNCLEAR

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Expanded List of Human Health and Environmental Areas for Stage 1 Screening (80 factors)

FOR DEMONSTRATION ONLY. NOT FOR COMPLIANCE PURPOSES.

80 factors (not including individual chemicals emissions)
+ 130 individual chemicals

1. Adverse public health impacts
   - (A) Carcinogenicity
   - (B) Developmental Toxicity
   - (C) Reproductive Toxicity
   - (D) Cardiovascular Toxicity
   - (E) Dermatotoxicity
   - (F) Endocrine Toxicity
   - (G) Epigenetic Toxicity
   - (H) Genotoxicity
   - (I) Hematotoxicity
   - (J) Hepatotoxicity
   - (K) Digestive System Toxicity
   - (L) Immunotoxicity
   - (M) Musculoskeletal Toxicity
   - (N) Nephrotoxicity and Other Toxicity to the Urinary System
   - (O) Neurodevelopmental Toxicity

2. Adverse environmental impacts
   - (A) Adverse air quality impacts;
     - Emissions of CA Toxic Air Contaminants (21) including:
       - Benzene, Ethylene Dibromide (1,2-dibromoethane), Ethylene Dichloride (1,2-dichloroethane), Hexavalent chromium, Asbestos, Dibenzo-p-dioxins and Dibenzofurans chlorinated in the 2,3,7 and 8 positions and containing 4,5,6 or 7 chlorine atoms, Cadmium (metallic cadmium and cadmium compounds), Carbon Tetrachloride(tetrachloromethane), Ethylene Oxide (1,2-epoxyethane), Methylene Chloride (Dichloromethane), Trichloroethylene (Trichloroethene), Chloroform, Vinyl chloride (Chloroethylene), Inorganic Arsenic, Nickel (metallic nickel and inorganic nickel compounds), Perchloroethylene (Tetrachloroethylene), Formaldehyde, 1,3-Butadiene, Inorganic Lead, Particulate Emissions from Diesel-Fueled Engines
     - Emissions of GHGs (7), including: Carbon dioxide, Hydrofluorocarbons, Methane, Nitrogen trifluoride, Nitrous oxide, Perfluorocarbons, Sulfur hexafluoride, or Gases that exhibit the global warming potential hazard trait, as specified in section 69405.4;
     - Emissions of nitrogen oxides;
     - Emissions of particulate matter that exhibits the particle size or fiber dimension hazard trait, as specified in section 69405.7;
     - Emissions of chemical substances that exhibit the stratospheric ozone depletion potential hazard trait, as specified in section 69405.8;
     - Emissions of sulfur oxides; or
     - Emissions of tropospheric ozone-forming compounds, including compounds that exhibit the ambient ozone formation hazard trait, as specified in section 69405.1.
   - (B) Adverse ecological impacts;
     - Acute or chronic toxicity;
     - Changes in population size, reductions in biodiversity, or changes in ecological communities; and
     - The ability of an endangered or threatened species to survive or reproduce;
     - Deterioration or loss of environmentally sensitive habitats;
     - Impacts that contribute to or cause vegetation contamination or damage; and
     - Adverse impacts on environments that have been designated as impaired by a California State or federal regulatory agency;
     - Biological or chemical contamination of soils; or
     - Any other adverse effect in:
       - Domesticated Animal Toxicity
       - Eutrophication
       - Impairment of Waste Management Organisms
       - Loss of Genetic Diversity, Including Biodiversity
       - Phytotoxicity
       - Wildlife Developmental Impairment
       - Wildlife Growth Impairment
       - Wildlife Reproductive Impairment
       - Wildlife Survival Impairment
   - (C) Adverse soil quality impacts;
     - Compaction or other structural changes
     - Erosion
     - Loss of organic matter
     - Soil sealing
   - (D) Adverse water quality impacts (of the waters of the State);
     - Increase in biological oxygen demand;
     - Increase in chemical oxygen demand;
     - Increase in temperature;
     - Increase in total dissolved solids; or
     - Introduction of, or increase in, any of the following:
       1. CWA 303(c) pollutants for CA (36) including:
          - chromium III, cyanide, antimony, thallium, asbestos, acrolein, acrylonitrile, carbon tetrachloride, chlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, 1,3-dichloropropylene, ethylbenzene, 1,1,2,2-tetrachloroethane, tetrachloroethylene, 1,1,2-trichloroethane, trichloroethylene, vinyl chloride, 2,4-dichlorophenol, 2-methyl-4,6-dinitrophenol, 2,4-dinitrophenol, benzidine, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, 3,3-dichlorobenzidine, diethyl phthalate, dimethyl phthalate, di-n-butyl phthalate, 2,4-dinitrotoluene, 1,2-diphenylhydrazine, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, isophorone, nitrobenzene, n-nitrosodimethylamine, n-nitrosodiphenylamine.
       2. CWA 303(d) pollutants for CA (14) including:
          - Arsenic, Cadmium, Chromium VI, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Zinc, Boron and Chloride salts, PCBs.
       3. Safe Drinking Water Act pollutants with MCLs (46) including:
          - Antimony, Arsenic, Asbestos, Barium, Beryllium, Cadmium, Chromium, Copper, free Cyanide, Fluoride, Lead, Mercury (inorganic), Nitrate (measured as Nitrogen), Nitrite (measured as Nitrogen), Selenium, Thallium, Acrylamide, Benzene, Benzo(a)pyrene (PAHs), Carbofuran, Carbon tetrachloride, Chlorobenzene, o-Dichlorobenzene, p-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Di(2-ethylhexyl) adipate, Di(2-ethylhexyl) phthalate, Dioxin (2,3,7,8-TCDD), Epichlorohydrin, Ethylbenzene, Ethylene dibromide, Polychlorinated biphenyls (PCBs), Styrene, Tetrachloroethylene, Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl chloride, Xylenes
       4. CA HSC 116455 with Notification Levels (27) including:
          - Boron, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon disulfide, Chlorate, 2-Chlorotoluene, 4-Chlorotoluene, Dichlorodifluoromethane (Freon 12), 1,4-Dioxane, Ethylene glycol, Formaldehyde, HMX, Isopropylbenzene, Manganese, Methyl isobutyl ketone (MIBK), Naphthalene, N-Nitrosodiethylamine (NDEA), N-Nitrosodimethylamine (NDMA), N-Nitrosodi-n-propylamine (NDPA), n-Propylbenzene, RDX, Tertiary butyl alcohol (TBA), 1,2,3-Trichloropropane (1,2,3-TCP), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2,4,6-Trinitrotoluene (TNT), Vanadium
       5. CA Safe Drinking Water Act with public health goals (66) including:
          - Dibromo-3-chloropropane, 1,2-Dichloroethane, 1,2-Dichloroethylene, cis, 1,2-Dichloroethylene, trans, 1,2-Dichloropropane, 1,1,2-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dichlorophenoxyacetic acid, Aluminum, Antimony, Arsenic, Asbestos, Barium, Benzene, Benzo[a]pyrene, Beryllium, Bromate, Cadmium, Carbofuran, Carbon Tetrachloride, Chlorite, Chlorobenzene, Hexavalent Chromium, Copper, Cyanide, Dichloromethane, Diethylhexyl adipate, Diethylhexylphthalate (DEHP), Ethylbenzene, Ethylene dibromide, Fluoride, Gross Alpha or Beta Particle Activity, Hexachlorobenzene, Hexachlorocyclopentadiene, Lead, Mercury (inorganic), Methyl tertiary butyl ether (MTBE), N-Nitrosodimethylamine, Nickel, Nitrate, Nitrate and Nitrite, Nitrite, Perchlorate, Polychlorinated Biphenyls (PCBs), Radium-226, Radium-228, Selenium, Strontium-90, Styrene, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), Tetrachloroethylene, Thallium, Toluene, Trichloroethylene, Trichlorofluoromethane (Freon 11), Trichlorotrifluoroethane (Freon 113), Tritium, Uranium, Vinyl Chloride,
     - (E) Exceedance of an enforceable California or federal regulatory standard relating to the protection of the environment.
   - 3. Environmental fate;
     - (A) Aerobic and anaerobic half-lives;
     - (B) Aqueous hydrolysis half-life;
     - (C) Atmospheric oxidation rate;
     - (D) Bioaccumulation;
     - (E) Biodegradation;
     - (F) Mobility in environmental media, as specified in section 69405.6;
     - (G) Persistence; and
     - (H) Photodegradation.
   - 4. Physical chemical hazards#
     - (A) Combustion Facilitation
     - (B) Explosivity
     - (C) Flammability
   - 5. Physicochemical properties#
     - (A) Physical state;
     - (B) Molecular weight;
     - (C) Density;
     - (D) Vapor pressure and saturated vapor pressure;
     - (E) Melting point;
     - (F) Boiling point;
     - (G) Water solubility;
     - (H) Lipid solubility;
     - (I) Octanol-water partition coefficient, octanol-air partition coefficient,
     - (J) Diffusivity in air and water;
     - (K) Henry's Law constant;
     - (L) Sorption coefficient for soil and sediment;
     - (M) Redox potential;
     - (N) Photolysis rates;
     - (O) Hydrolysis rates;
     - (P) Dissociation constants; or
     - (Q) Reactivity including electrophilicity

80 factors x 12 life cycle segments = 960 combinations

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Stage 1 -> Preliminary AA Report

Identification of Relevant Factors

- Large number of factors
- Unclear how to substantiate decisions

USED GreenScreen/DfE Human Health and Eco Factors and Life Cycle Thinking

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Stage 1 Summary Matrix

Table 3: Alternatives to Deca-BDE in Electronic Enclosures Summary Table

	Raw Materials		Manufacture			Transportation[7]	Use		End-of-Life	
Material	Raw Materials Extraction	Resource Inputs and Other Resource Consumption	Intermediate Materials Processes	Manufacture	Waste Generation and Management	Packaging Transportation and Distribution	Use	Operation and Maintenance[8]	Reuse and Recycling	End-of-Life Disposal
DecaBDE	L^{9}		$H_{B, C, E}$	L	M	L	$M_{B, D}$	L	$H_{A, B, C, D, E, F}$	$H_{A, B, C, D, F}$
Monomeric N-alkoxy hindered amine	$M_{A,B,D, E, F}$		H_B	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Polyphosphonate oligomers	$M_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
APP Ammonium Polyphosphate	$M_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
ATH - Aluminium tri-hydroxide	$H_{A,B,D, E, F}$		$H_{B, C, E}$	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Diethylphosphinate, aluminium salt	$H_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
MDH - Magnesium di-hydroxide	$H_{A,B,D, E, F}$		$H_{B, C, E}$	M_X	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Melamine Cyanurate	$M_{A,B,D, E, F}$		H_B	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Melamine Polyphosphate	$M_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
P/N based intumescent systems piperazine pyrophosphate	$M_{A,B,D, E, F}$		H_F	L	M	L	$M_{B, D}$	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Polcarbonate-Polyphosphonate copolymer	$M_{A,B,D, E, F}$		H_B	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
RDP Resorcinol bis (diphenyl phosphate)	$M_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
TPP - triphenyl phosphate	$M_{A,B,D, E, F}$		H_F	L	M	L	L_D	L	$M_{A, B, C, D, E, F}$	$M_{A, B, C, D, F}$
Aluminum housing material	$H_{A,B,D, E, F}$		$H_{B, C, E}$	H_X	L	L	L_D	L	L_X	L

Legend:

- Relevant Factor
- Non-Relevant Factor
- Unknown

Bold font indicates empirical data

Italic font indicates lower confidence estimate based professional judgment.

- A Adverse Environmental Impacts
- B Adverse Public Health Impact
- C Adverse Waste and End-of-Life Effects
- D Environmental Fate
- E Materials and Resource Consumption Impacts
- F Physical Chemical Hazards

  Physicochemical Properties

- X Energy-Alternative may result in higher energy consumption. Depending on the energy source there may be impacts in areas A through F.

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Stage 1 -> Preliminary AA Report

Work Plan and Next Steps

- Nebulous instructions
- Needs to be a fairly detailed plan of planned analyses and tools for Stage 2

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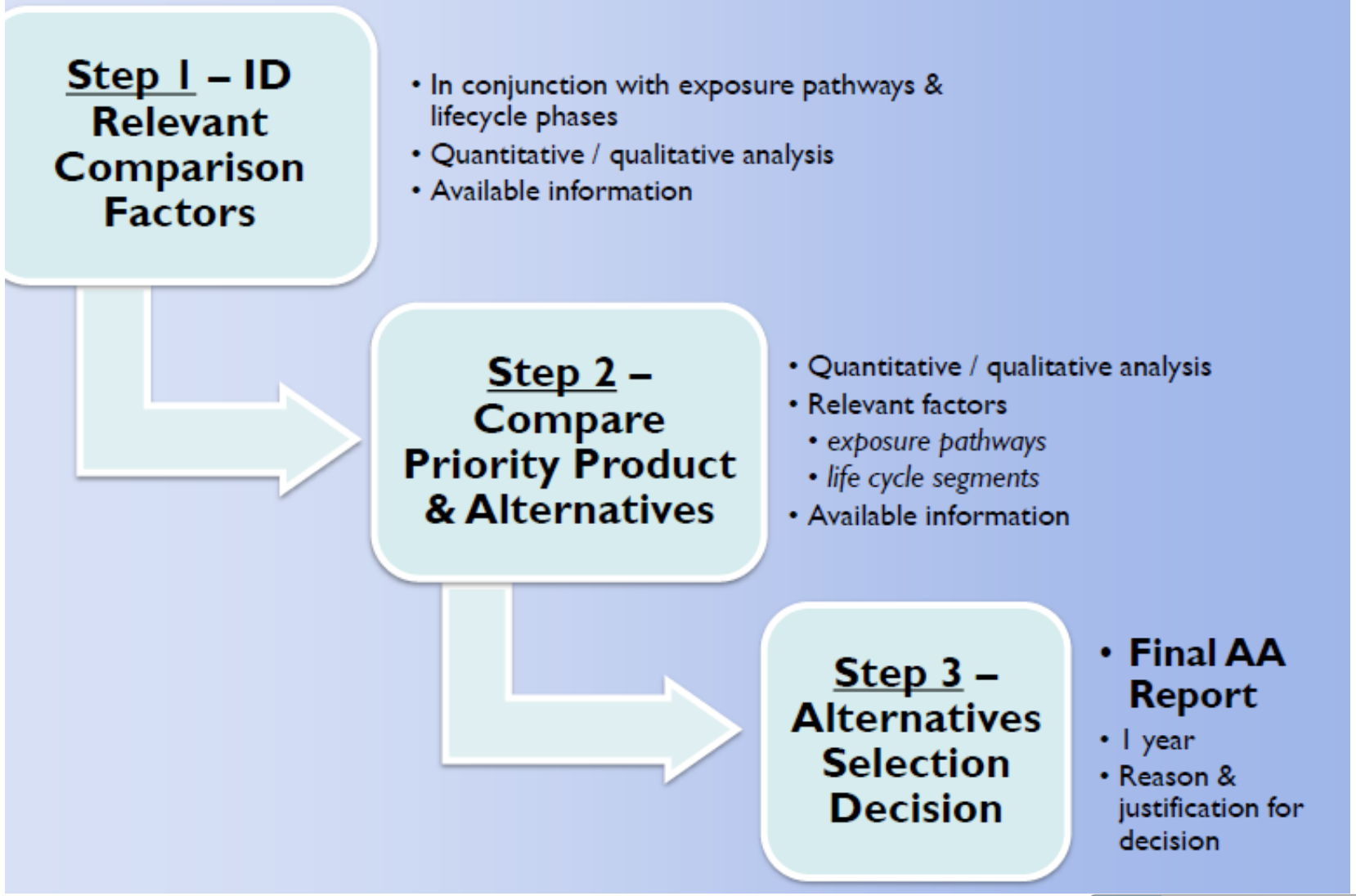
Second Stage of Alternatives Analysis



From: Lynn Goldman's presentation to the Green Ribbon Science Panel on 29 January 2014
http://www.dtsc.ca.gov/SCP/upload/GRSP-lgoldman.pdf

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Stage 2 -> Final AA Report

For this pilot:

Preliminary + Stage 2 = Final

Second Stage Analysis:

1. Multimedia Life Cycle Assessment
Completion: 20 weeks after approval of Phase 1 AA
Output: Potential alternatives associated with signific
module will be removed from further consideration.

2. Product Function & Performance
Completion: 29 weeks after approval of Phase 1 AA
Output: Potential alternatives will be identified that a

3. Economic Impact
Completion: 29 weeks after approval of Phase 1 AA
Output: Potential alternatives associated with signifi

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Work Plan for Stage 2

Second Stage Analysis:

1. Multimedia Life Cycle Assessment

Completion: 20 weeks after approval of Phase 1 AA

Output: Potential alternatives associated with significant burden shifting after evaluation using the life cycle thinking module will be removed from further consideration.

Used Screening LCA to identify hotspots
Estimated impacts for alternatives

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Work Plan for Stage 2

2. Product Function & Performance

Completion: 29 weeks after approval of Phase 1 AA

Output: Potential alternatives will be identified that are expected to meet safety and performance standards.

Used material properties and finite element modeling to estimate performance impacts

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Work Plan for Stage 2

3. Economic Impact

Completion: 29 weeks after approval of Phase 1 AA

Output: Potential alternatives associated with significant burden shifting will be removed from further consideration.

Used a previous analysis conducted by Washington State Department of Ecology as source for data and methods

-- DEEPLY PROBLEMATIC--
NO DATA SOURCES
NO METHODS

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DecaBDE Pilot Observations

- Stage 1 was more manageable, tools are available
  - Unclear how to substantiate “relevance” determination
  - Unclear how much analysis will be considered sufficient
  - Unclear how to handle data gaps
- Stage 2 was harder, larger scope, fewer tools
  - Meaningful economic analysis may not be possible in some cases

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NPE Report Also Available

Priority Product / Chemical of Concern

- All-purpose cleaners containing Nonylphenol Ethoxylates (NPE)
- Presents complete GreenScreen assessments (not just hazard summary tables)
- *Some key observations:*
  - *Data gaps for alternatives*
  - *No efficacy standard*
  - *No economic data*
  - *No direct life cycle data*

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How to Comment on Reports

Preliminary and Final AA Reports available for public comment at BizNGO web site http://www.biznGO.org

Deadline March 26

Although WE are not providing legal guidance on whether these reports comply with the regulations, COMMENTERS are welcome to provide their opinions on compliance.

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THANK YOU

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Complexity vs Parsimony*

Maximalist

- Large number of factors
- Desire to be thorough and make high confidence decision
- Conclusions need to withstand scrutiny and peer review
- Need to defend against single issue criticism/activism
- Need to meet statutory requirements
- Maximum employment for consultants

Parsimonious

- Large number of factors can result in less differentiation between options
- Less differentiation increases chance of cognitive bias in decision making
- Resource and time constraints
- Perfect model doesn't exist
  - Maximum analyses can still result in unforeseen consequences

*Principle of "parsimony" – the ideal of explaining phenomena using fewer parameters

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