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Metals in Children's and Consumer Products and Packaging

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Metals in Children's and Consumers Products and Packaging

by

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Abstract

The Washington State Department of Ecology's Waste 2 Resources (W2R) and Hazardous Waste and Toxics Reduction (HWTR) programs conducted a study to evaluate the presence of ten metals in children's products and packaging. Metals have a number of uses in products, including dyes, ultraviolet (UV) absorbers, flame retardants, etc. The study was conducted to:

- Evaluate compliance with Washington's Children's Safe Product Act (CSPA) reporting requirements and Washington's toxics in packaging legislation metal level restrictions.
- Verify children's products and children's and consumer product packaging could be analyzed at expect levels using existing analytical methodologies.
- Evaluate children's products and children's and consumer packaging for metals negatively impacting the Puget Sound.

It was funded by a grant from the Washington State Attorney General's Office.

Children's products were tested for ten metals (antimony, arsenic, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, and zinc). A wide range of product types were tested and metals were found in appreciable levels in many products to which children are exposed primarily either by mouth or applied to their skin. In addition, seasonal products, such as Halloween accessories, contained many of the metals of concern. Packaging analysis found that manufacturers have improved compliance with toxics in packaging legislation, as only one sample was found to fail the 100 parts per million (ppm) limit for the sum of the four metals restricted under the packaging legislation. Product components were identified that contained high levels of copper and zinc, two metals that are negatively impacting water quality in the Puget Sound.

The test results also showed that products could be tested for metals using existing methodologies. Metals were routinely detected at less than the 1 ppm level validating the practical quantitation limit (PQL) of 1 ppm in Ecology's Reporting Guidance.[2] The lower detection limits obtained in this study suggest a lower PQL in the Reporting Guidance may be appropriate.

Ecology initiated compliance correspondence for 19 metals results. Antimony was the most common subject of compliance assurance, followed by cobalt. In most cases, the manufacturer was in compliance with the CSPA as the company's annual sales were low enough that reporting was not yet required due to the CSPA reporting rule's[3] phase in schedule. Ecology also identified 2 results from these studies that indicated possible violations of the limits on lead in the CSPA[4].

[2] Children's Safe Product Act-Reporting Rule-WAC 173-334, Reporting Guidance-Practical Quantitation Limits (PQLs), available at: http://www.ecy.wa.gov/programs/swfa/cspa/pdf/cspaguide_pql.pdf, accessed 12/2013.
[3] Specifically, WAC 173-335-110
[4] As per RCW 70.240.020

Background

The Children's Safe Product Act (CSPA), passed by the Washington State Legislature in 2008, (Chapter 70.240 RCW) requires manufacturers to report the presence of six toxic metals in all components of children's products. This includes both the product itself and the container holding the product. The Department of Ecology (Ecology) tested children's and consumer product components, including contents and containers, for the six heavy metals on Ecology's chemicals of high concern to children (CHCC) list.

The CSPA Reporting Rule was finalized in June of 2011 and implements the reporting requirements under the CSPA. Under the rule, companies making children's products must report on 66 chemicals or classes of chemicals if found in children's products (Ecology, 2009). The list includes chemicals that have primarily either been found in children's products or have been documented to be present in human tissues. Six metals are included in this list. The CSPA also provides regulatory limits for cadmium and lead, which were substantially preempted by later federal legislation, the Consumer Product Safety Improvement Act (CPSIA) (CPSC, 2008).

Children's products containing the six CHCCs must be reported to Ecology. Reporting requirements will begin with the largest manufacturers who make products intended for mouth or skin contact or any product that is mouthable for children three years and under. Other manufacturers report using a phased-in schedule included in the rule.

In 1991, the Washington State Legislature passed Chapter 70.95G RCW (Packages Containing Metals, 1991) that limits the amount of four toxic metals (mercury, cadmium, lead, and hexavalent chromium) in packaging sold in Washington State. Ecology was identified as the responsible agency for implementing this legislation. The legislation contains a very broad definition for both packaging and packaging components.[5] Packaging is defined as:

"Package" means a container providing a means of marketing, protecting, or handling a product and shall include a unit package, an intermediate package, and a shipping container. "Package" also means and includes unsealed receptacles such as carrying cases, crates, cups, pails, rigid foil and other trays, wrappers and wrapping films, bags, and tubs.

A packaging component is defined as:

"Packaging component" means an individual assembled part of a package such as, but not limited to, any interior or exterior blocking, bracing, cushioning, weatherproofing, exterior strapping, coatings, closures, inks, and labels.

The legislation establishes a limit of 100 ppm for the total concentration of all four metals. Ecology does not have any penalty authority under the legislation but may ban the sale of any product that does not meet the regulated levels if a company refuses to comply.

[5] 70.95G.010, accessed 1/23/2012.

In 2007, Ecology joined the Toxics in Packaging Clearinghouse (TPCH), an association of nine states with similar legislation.[6] The TPCH has facilitated education and outreach to businesses on toxics in packaging requirements and has conducted several sampling events to emphasize the need for compliance with packaging legislation. Individual states have also conducted packaging sampling to guarantee compliance. While the CSPA does not require reporting on the presence of chemicals in packaging, the metals identified as CHCCs are of interest for this study. (Ecology, 2009) Packaging is not restricted solely to children's products but includes general consumer products that have been identified previously as a problem. Most of the packaging results, however, are specific to children's products.

Copper and zinc are toxic to aquatic species and particularly the development of fish. As indicated in a report from the U.S. Fish and Wildlife Services:

'Mixtures of zinc and copper are generally acknowledged to be more-than-additive in toxicity to a wide variety of aquatic organisms…'

The aquatic organisms impacted by zinc and copper include oysters and both marine and freshwater fish among others. (Eisler, 1993)

Ecology's HWTR and W2R Programs analyzed children's products and packaging for the ten metals. The ten metals consist of the six potentially toxic metals in the CSPA (antimony, arsenic, cadmium, cobalt, mercury, and molybdenum), two additional metals (lead and chromium) of interest for toxics in packaging legislation, and two metals (copper and zinc) negatively impacting the Puget Sound.

Sampling Process

Children's and general consumer products were purchased for testing from local stores and internet retailers. Special emphasis was placed on products designed to be applied to the skin or ingested. The products were separated into three components: packaging, containers, and product. For example, a container of children's lip-gloss was separated into packaging, product (lip gloss itself), and container (the device used to store and apply the lip-gloss). Depending upon its construction, the container was separated into different components as identified in the CSPA rule.

Children's products were purchased as indicated in three Quality Assurance Project Plans (QAPP) for parabens (Ecology, 2012a), phthalates (Ecology, 2012b) and formaldehyde, and volatile organic chemicals (VOCs) (Ecology, 2012c). Packaging is not covered under the CSPA but was analyzed in consumer and children's products under a separate QAPP (Ecology, 2012d).

Initially all products, packaging, and product components were scanned for presence of metals using a Niton XL3t 700 XRF analyzer as identified in the product testing QAPPs (Ecology, 2012a-d). Four hundred and seven products were separated into 1,359 product components. Two hundred and fifty-five 255 packages were broken down into 387 components. All 1,614 components were scanned. Those showing an appreciable concentration of any metal of concern were sent to a contract laboratory for analysis.

[6] Toxics in Packaging Clearinghouse, accessed 1/23/2012.

Samples were prioritized with the highest priority given to product components containing appreciable levels of the six CHCCs (antimony, arsenic, cadmium, cobalt, mercury, molybdenum). Next were those containing the two additional metals (lead and total chromium, as possible indicator of hexavalent chromium) covered by the toxics in packaging legislation (the other metals covered by this legislation, cadmium and mercury are also CHCCs). Lastly were those containing the two metals (copper and zinc) impacting Puget Sound.

Product labels, product databases from government and non-governmental organizations (NGO) sources, internet searches, etc. were used to identify products potentially containing metals of concern. Products that were found, based upon the screening results, to contain at least one of the metals of concern were sent to a contract laboratory for analysis. One hundred and fifty components were sent for metals analysis. Laboratory analyses were conducted using an inductively coupled plasma mass spectroscopy (ICP-MS) (nine metals) and cold vapor atomic absorption (CVAA) (mercury) (Ecology, 2021a; 2012b; 2012c; 2012d).

Data Quality

Due to concerns about cadmium and possible preemption of the CSPA by the federal CPSIA (CPSC, 2008), cadmium was initially omitted from analysis in some of the QAPPs covered by this study. For example, cadmium was not identified as a chemical of interest in the QAPP for Parabens and Metals in Children's Cosmetic and Personal Care Products. (Ecology, 2008a). After some preliminary results were obtained, the decision was made to include cadmium in all remaining product analyses. Some of the data reported here, however, lack values for cadmium. In those instances, the term 'Not Analyzed' or 'NA' is used in Appendix 1 where cadmium was neither requested nor reported. The presence of an 'NA' is not indicative of any problems with the sample or analysis.

No unannounced duplicates were run for metals. One sample, packaging for a bubble bath product (WM003) was submitted as a duplicate; however, no other packaging sample was submitted for the same product and no comparison is possible. All data results were found to be within the quality assurance and quality control parameters established within the applicable QAPPs (Ecology, 2011a-d.)

Product Results

Metal results from four QAPPs are combined in this single report (Ecology, 2013a, 2013b, 2013c, and 2013d). The results are separated into three different sections as data was collected to evaluate metal concentrations in children's products and packaging. These ten metals were evaluated to determine:

1. Metals of high concern to children in children's products including antimony (Sb), arsenic (As), cadmium (Cd), cobalt (Co), mercury (Hg), and molybdenum (Mo). Lead (Pb) is also restricted in the CSPA but was preempted by subsequent federal legislation; therefore, lead values were included to determine if it was still being used in children's products and to evaluate compliance with federal regulations.

2. Metal concentrations in packaging, especially lead (Pb), mercury (Hg), and total chromium (Cr). Mercury is rarely found in packaging. Total chromium (Cr) results are provided as a potential indicator of the presence of hexavalent chromium (Cr+6), a known carcinogen (NTP, 2011). Further analysis is needed to separate Cr+6 from trivalent Cr (Cr+3). Cr+6 cannot currently be analyzed routinely in products and methods are under development. Therefore, analysis of Cr+6 is outside the scope of this project.

3. Concentrations of copper (Cu) and zinc (Zn), two metals identified as negatively impacting Puget Sound, in children's products and packaging.

The results are further complicated as some analytical results will be reported in more than one of the three groups as some samples met the definition of both a children's product (1) and packaging (2). For example, a pirate decorated pencil case (Figure 1) was separated into two components, the case itself and the zipper holding the case closed. The pencil case meets the definition of both a package and a children's product and, as such, the data from both samples appear in the children's products and packaging results. Those products that met both definitions will be discussed in the Product Packaging section.

Figure 1: Example of product that was identified as both a children's product and packaging.

Children's Products

One hundred and one products (Table 1) were analyzed for ten metals. Only the results for the six metals identified as chemicals of high concern to children will be discussed in this section. The other four metals will be discussed in subsequent sections, if appropriate.

Table 1: Children's products tested for metals

Sample	Item description	Sample	Item description
AM003-c01	Soft baby toothbrush teether	SF004-c01	Fake gold teeth from quarter machine
AM004-c01	Bumpy raspberry teething pacifier	SH001-c01	White face powder
AM005-c01	Baby tooth brush	SH003-c06	Face Painting Kit
AM010-c01	Girls blue jeans	SH004-c01	Family Value Makeup kit
AM011-c01	Boys jeans, button up & sweater	SK019-c03	12 Roll-on lip glosses
AM012-c02	5 Boys onesies	SK020-c01	Monster High Makeup kit
AM013-c02	3 Onesies	SP000-c02	Baby Shoes
AM014-c02	Jeans & Jacket	SP001-c01	Baby Sandals
AM015-c02	Onesie & Overalls	SP002-c01	Pacifier
AM016-c01	Overalls	TG000-c01	2 Pacifier set
AM017-c01	Girls Blue Jeans size 3	TG007-c01	2 Fresh food feeders
AM018-c01	Girls blue jeans	TG010-c01	2 Pacifier set
AM019-c01	Boys jeans, t-shirt & jacket	TG013-c01	Contact nipple shield
AM020-c01	Girls Jeans	TG014-c01	Wide base nipples
AM021-c01	Girls Jeans	TG017-c01	Ernie book
BL000-c01	Glitter girl Glitz Nails	TG018-c01	2 Pacifier set
BL002-b01	Spider Sense Spider Man Foil Puzzle	TG020-c01	HPA lanolin
CL000-c01	Hello Kitty Ring	TG022-c01	Assorted play-doh
CL001-c03	Tangled Flavored Lip Gloss 4 pack	TG023-c03	Space footie pajamas
CL003-c01	Nerds scented nail polish pack	TG062-c02	Body Wash - Vanilla Swirl
CL004-c01	Hello Kitty Nail Polish Pack	TR000-c01	Silicone nipples
CL005-c02	Hello Kitty Ring	TR001-c01	Sesame street toothbrush
CL007-b04	Make up pack	TR002-c01	Toddler wipes
CL008-c02	Pink Coin Purse	TR005-c02	Pacifier
CL009-b02	Lip gloss set	TR006-c01	Girly temp tattoos
CT001-c02	Tummy play pad	TR007-c01	Boy temp tattoos
DT000-c01	3 Pack silicone nipples	TR009-c01	Pink teething ring
DT003-c05	Changeable Gem pendant	TR011-c01	Mesh food sacks
DT004-c03	Dream Bride Wedding Day variety pack	TR012-c01	Dr. Suess bib
DT005-c01	Disposable baby bibs	TR014-c01	Travel baby wipes
DT006-c01	Colored moldable "play" dough	TR022-c02	Pee protector with basketball motif
DT008-b02	Petroleum Jelly	WG004-c01	Baby Wash
DT033-b01	Bedtime Baby Cream	WM004-b01	Color Bath Dropz
DT041-c01	Orange stuffed fish	WM005-c01	Small baby bottle
FM002-c02	3 Baby spoons	WM008-c01	Squishy book
FM003-c01	Scented neon nail polish set	WM009-c01	Basketball pacifiers
FM004-c01	Face paint crayons	WM010-c04	Princess keychain & chapsticks
FM006-c01	Baby powder	WM012-c01	Soothie pacifier
FM007-c02	Princess lip balm & keychain in tube	WM014-b02	Chocolate flavored gloss & chapstick

Sample	Item description	Sample	Item description
FM010-c01	2 Pacifier set	WM015-c01	Pink bib
FM030-c01	Pink plastic recorder	WM020-c01	Pink baby ballet slippers
IC000-c01	Maroon Gem earrings	WM033-c03	Sponge Bob briefs
IC001-c01	Plastic earrings - 6 pairs	WM046-b02	Minnie Mouse Pencil Case
IC002-c01	Plastic earrings - 9 pairs	WM049-b01	Pirate Pencil Case
IC003-c02	Butterfly ring	WM050-c02	Mickey Mouse undies
JN000-c01	White Nike Tennis Shoes & bib	WM052-c02	2 Wooden whistles
JN001-c01	Puma/Ferrari Tennis Shoes	WM053-c01	4 Lip glosses with zipper pouch
ON002-c02	Baby converse looking-alike shoes	WM056-c08	"How to" DVD Makeup Kit
ON004-c02	Yellow baby mud boots	WM058-c01	Monster Value Makeup Set
RA000-c04	Halloween Makeup variety pack	WM062-c03	Water based make up
SF002-c01	Mom to mom supreme unscented wipes		

From the 101 products, 150 component samples were sent to the laboratory for analysis as some products were separated into multiple individual components. For example, a boy's jeans, shirt, and sweater set (Figure 2) was separated into six individual components including fabrics from three clothing items, buttons, and zipper. Multiple samples were collected from additional products and each component will be presented separately.

Figure 2 Boy's jeans, shirt, and sweater: set were separated into six components.

Products were grouped into nine larger categories of art supplies, baby and bath accessories, clothing, cosmetics, footwear, Halloween accessories, jewelry and accessories, lip balms, and toys (Table 2). Complete metal analyses are provided in Appendix 1.

Table 2: Breakdown of children's products into categories

Category	Nr. of Products	%
Baby and bath accessories	39	26.0
Clothing	31	20.7
Cosmetics and accessories	11	7.3
Footwear	16	10.7
Halloween accessories	23	15.3
Jewelry and accessories	13	8.7
Lip Balm	8	5.3
Toys	9	6.0

Table 3 breaks down metal analyses into broad groups. Chromium and lead values are also included as, although not identified as a CHCC, they are either listed in the CSPA directly (lead) or of potential interest for further analysis (chromium). Emphasis was placed upon products likely to be placed into the mouth or applied to the skin, which accounts for the larger number of samples of baby and bath accessories, cosmetics, and fragrances.

Lead, cobalt, and antimony were the most commonly found metals although lead concentrations were at very low levels. Antimony was found at the highest levels with eight values above 100 ppm. Mercury was found only in three samples with two being just above detection limit. Arsenic was found in a few products with most of the values above 10 ppm.

Table 3: Breakdown of levels (ppm) and % of total samples for six CHCC metals, lead, and chromium found in children's product components

Chemical	ND	%	<1	%	1 to <10	%	10 to <100	%	100 to <1,000	%	1,000 or >	%
Antimony	64	42.7	30	20.0	22	14.7	26	17.3	8	5.3	0	0.0
Arsenic	124	82.7	0	0.0	12	8.0	12	8.0	2	1.3	0	0.0
Cadmium	104	69.3	26	17.3	19	12.7	1	0.7	0	0.0	0	0.0
Chromium	57	38.0	32	21.3	39	26.0	9	6.0	12	8.0	1	0.7
Cobalt	52	34.7	50	33.3	28	18.7	14	9.3	6	4.0	0	0.0
Lead	43	28.7	60	40.0	20	13.3	25	16.7	2	1.3	0	0.0
Mercury	147	96.8	2	2.1	1	1.1	0	0.0	0	0.0	0	0.0
Molybdenum	103	68.7	30	20.0	11	7.3	6	4.0	0	0.0	0	0.0

Figure 3 shows metal concentrations found in baby and bath accessories. Of the six CHCC metals, only antimony (Sb) was found at appreciable levels in a variety of products including a tummy play pad (CT001 at 36.9 ppm), wipes (SF002, TR002 and TR014 at 70.6, 61.3 and 40.6 ppm, respectively), body wash (TG062 at 55.5 ppm), mesh food sacks (TR011 at 72.1 ppm) and baby bibs (TR012 and WM015 at 116 and 99.6 ppm, respectively). Cobalt (Co) was found in one product, a baby cream (DT033 at 36.9 ppm) at appreciable levels. Three products had detectable levels of mercury including baby spoons (FM002 at 0.3 ppm) and toothbrush and bath salts (TR001 and WM004 both at 0.3 ppm). All mercury values, however, were near the method detection limit and are unlikely to pose a hazard to children. Trace levels of the other metals were also found.

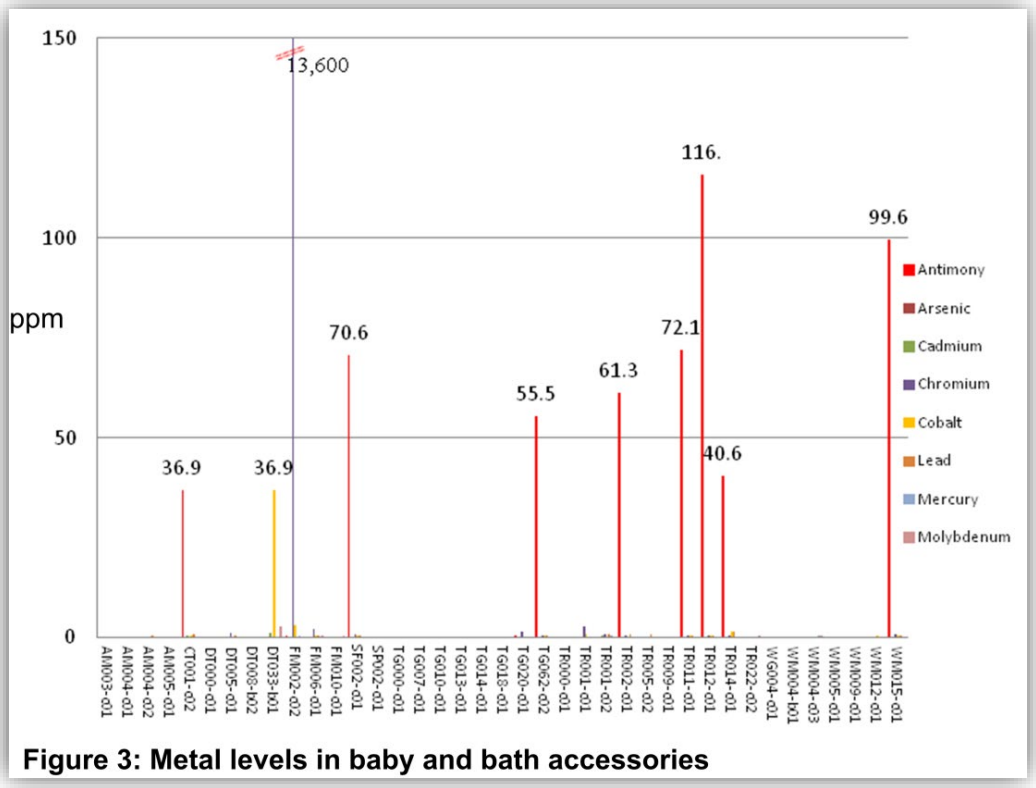

Figure 3: Metal levels in baby and bath accessories

Although not a CHCC, chromium was the highest metal concentration reported. Chromium was found at 13,600 (1.36%) in a set of metal baby spoons. Further evaluation may be warranted to determine if any of the chromium in the product is Cr+6.

Figure 4 shows metal concentrations found in children's clothing. Cobalt (Co) was found both in the most products and at the highest levels, ranging from low levels to a high of 560 ppm. Six of the 31 samples (20%) were at or above 100 ppm. These results agree with the large number of companies reporting the use of cobalt primarily as a dye. The only other CHCC metal found above 100 ppm was antimony at 121 and 128 ppm, primarily found in jeans. Lead was found in every sample tested although at low levels. Twelve samples contained lead between 10 and 70 ppm. A set of boy's space footie pajamas (TG023) had reportable levels of mercury at 2.8 ppm. The reason for mercury in this product is unknown and testing of additional clothing for mercury may be warranted. Based upon these results, the CHCC metals are present in the limited group of clothing tested.

Although not a CHCC, chromium was also found at 257 and 242 ppm, primarily in jeans.

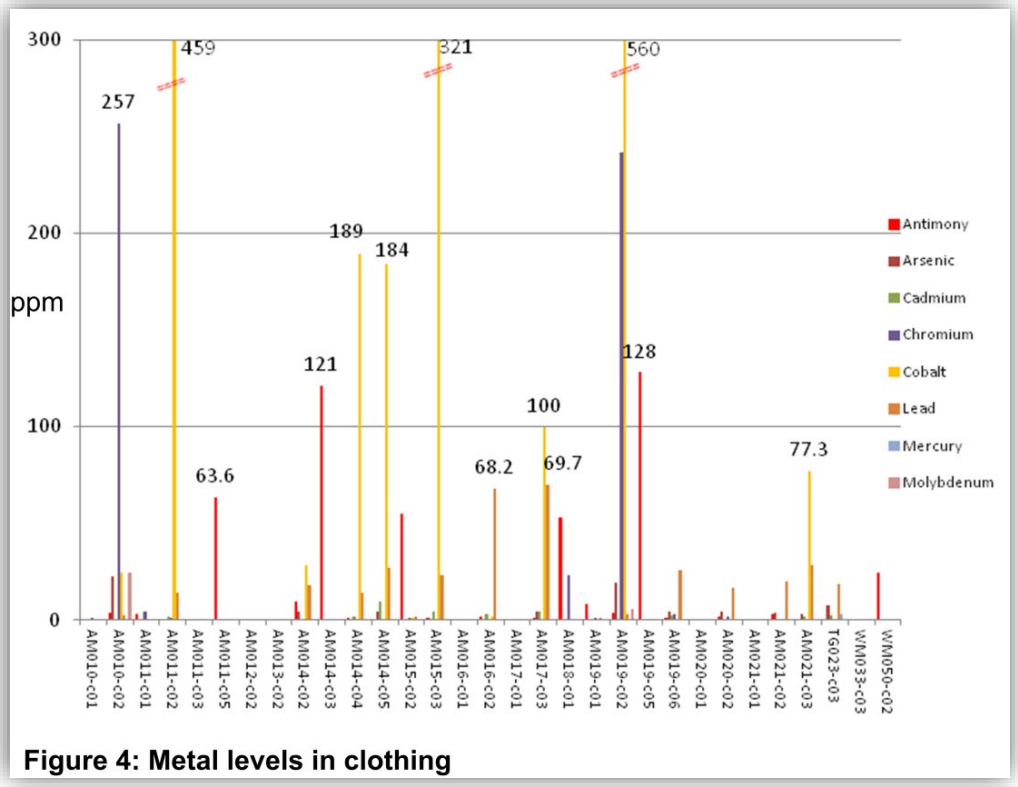

Figure 4: Metal levels in clothing

Figure 5 shows metal concentrations found in cosmetics and accessories. Cobalt and lead were the most commonly found CHCC metals although concentrations were at or below 35 ppm. Mercury was not found in any of the products tested. Based upon these results, CHCC metals were found in a limited group of cosmetics and accessories although at low concentrations.

Although not a CHCC, one product was found to contain chromium (CL007-b04[7] at 157 ppm) at appreciable levels in the external pouch of a make-up pack.

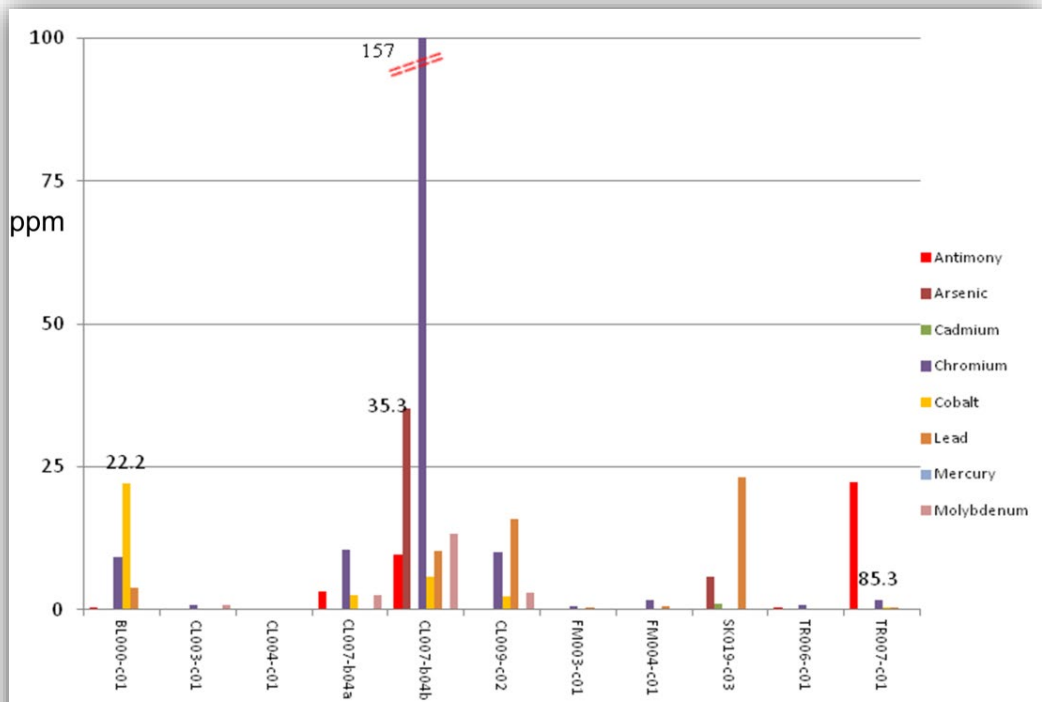

Figure 5: Metal levels in cosmetics and accessories

[7] Note: Two samples labeled CL007-b04 were submitted on separate chain of custodies approximately a month apart. There is no known explanation for the submittal of two samples and the results indicate they are not duplicate analyses. Therefore, it is unclear which of these two samples actually reflect product CL007. Both results are included in the sampling results.

Figure 6 shows metal concentrations found in Halloween accessories. Several samples contained antimony, cobalt, and lead at the 30 to 50 ppm level. Mercury was not found in any of the samples tested. The remaining sample concentrations were low, and around or below the practical quantitation limits established for the CSPA. The CHCC metals are found in Halloween products based upon the limited group of products tested.

Although not a CHCC, the highest level observed was for chromium found in a Halloween variety makeup pack (85.3 ppm). Several other samples had chromium concentrations in the 2 to 30 ppm range.

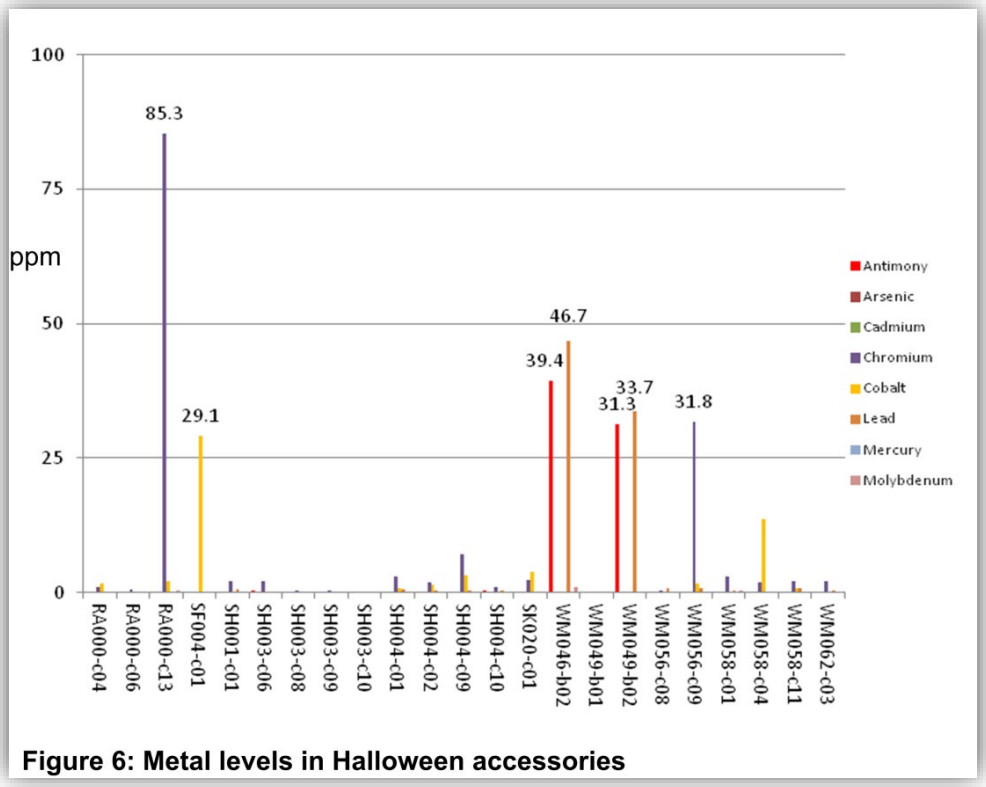

Figure 6: Metal levels in Halloween accessories

Figure 7 shows metal concentrations found in jewelry. Lead was the most commonly detected CHCC metal with lead found in all but one sample. Several products contained lead above 19 ppm with one product, a pair of plastic earrings, containing the highest level at 134 ppm. Another part of the plastic earrings contained arsenic at 125 ppm. Two products, a ring and pendant, also contained antimony at levels above 100 ppm. Mercury was not found in any of the components tested. Overall, CHCC metals were found in the limited group of jewelry tested. Although not a CHCC, chromium was found at the highest concentrations with four products above 100 ppm.

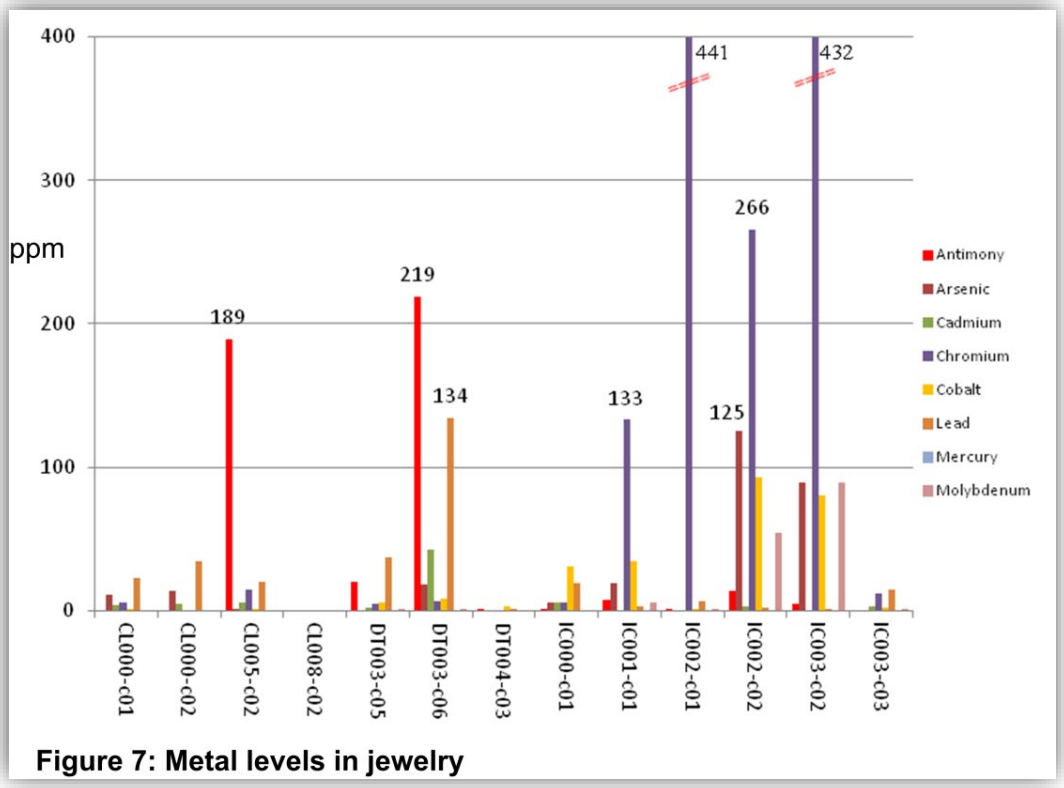

Figure 7: Metal levels in jewelry

Figure 8 shows metal concentrations found in a limited survey of lip balm samples. Metals were found in several components taken from lip balm samples. Samples of the lip balm itself showed low metal levels while lip balm containers or related components reported significant levels of specific metals. For example, antimony and arsenic were found at levels ranging from 72 to 350 ppm. Arsenic was found at 276 ppm in the chain from a keychain and lip balm set (WM010) and antimony was found at 156 ppm in the plastic tube containing lip balm (WM014). Lower levels of lead and cobalt were also found. Only cadmium and mercury were not found in any samples. Although it is difficult to reach any firm conclusion based upon the limited number of samples involved, it does appear metals might be an issue in lip balms containers although the lip balm itself contains only trace amounts.

Although not a CHCC, three components contained chromium ranging from 91 to 350 ppm.

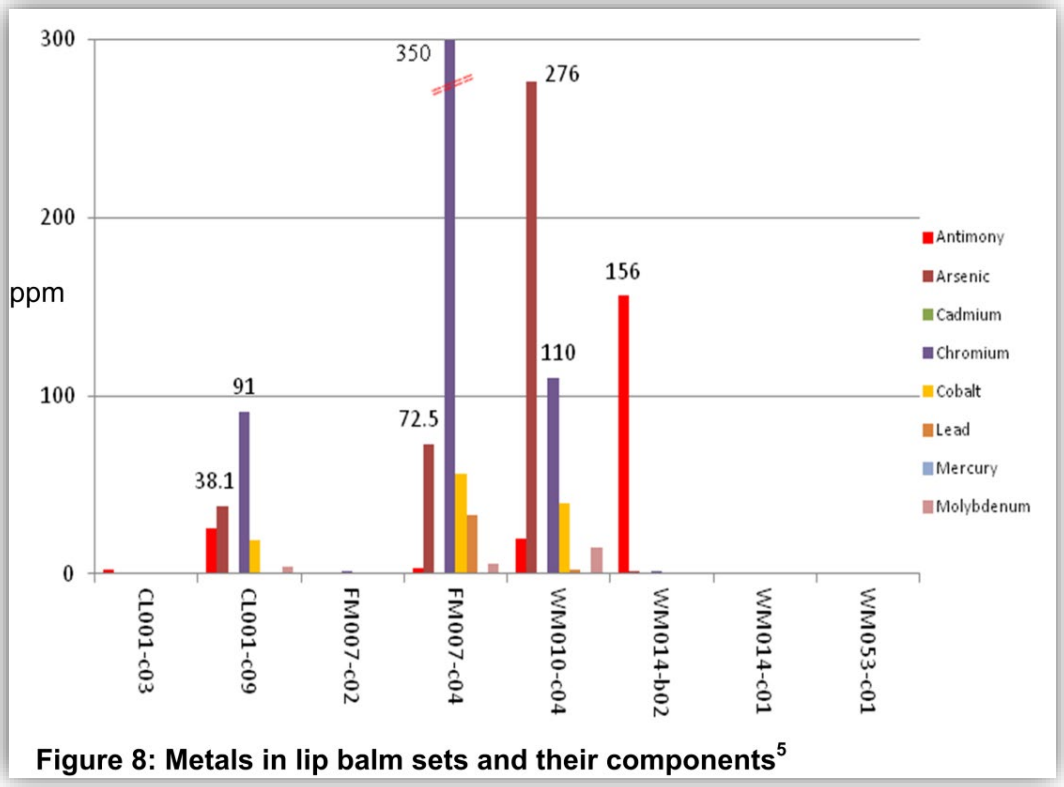

Figure 8: Metals in lip balm sets and their components[5]

[5] Note: This graph shows results for sample CL001-c09. Product information indicates there is no sample labeled CL001-c09 although there is a sample CL001-b09. As CL009-b09 was part of a metal box used to hold lip balm and likely to be selected for analysis., it is assumed a transcription error is the cause of the deviation and the results reflected are results for CL001-b09.

Figure 9 shows metal concentrations in a limited survey of toy samples. Antimony was the only CHCC metal found above 90 ppm, in an orange stuffed fish (168 ppm) and a plastic book (94 ppm). Mercury was not found in any of the product components tested. Although it is difficult to reach any conclusion based upon the limited number of samples tested, further study of children's toys may be warranted. Ecology initiated a study of Tier 3 products for phthalates and metals. This additional data may help determine if these products pose a threat to human health and the environment.

Although not a CHCC, chromium was found at the second highest reported value of 144 ppm in a foil puzzle.

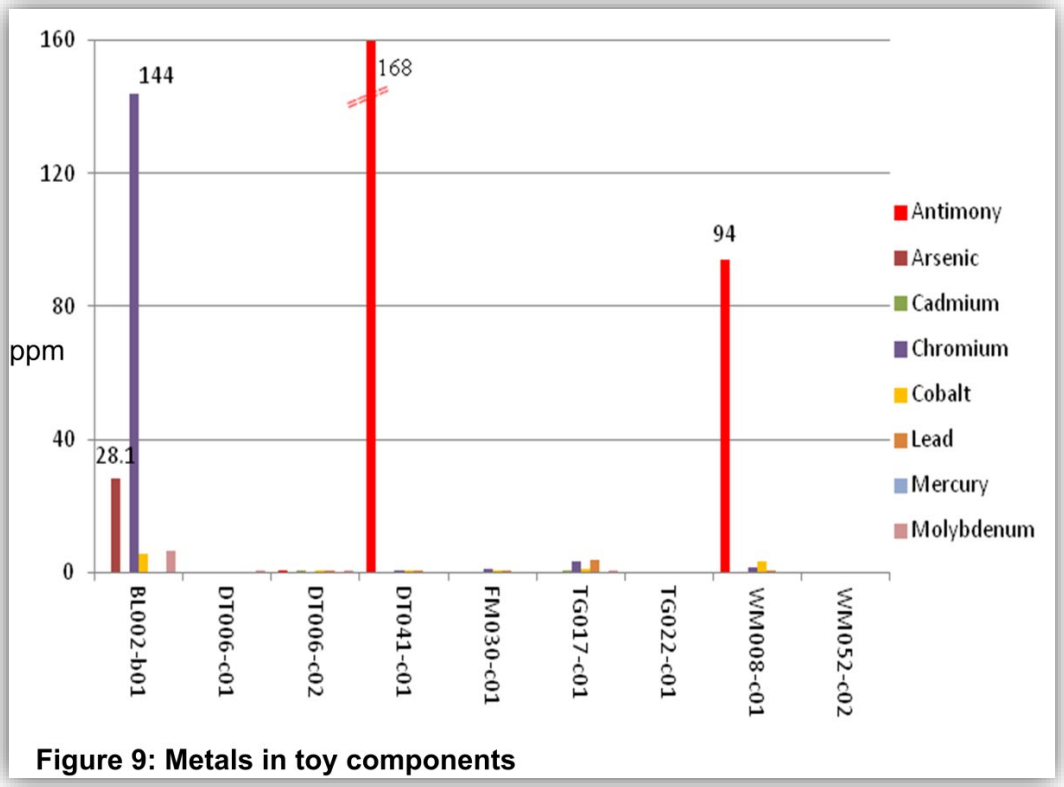

Figure 9: Metals in toy components

Sampling results are available in Appendix 2.

Compliance

Analytical results were compared with product data reported to Ecology as required by the CSPA. In response to results from this and other studies funded by Attorney General's office, Ecology initiated compliance correspondence with manufacturers regarding possible failure to report CHCCs as required by the CSPA. Ecology identified 73 results and sent 30 letters to

manufacturers containing one or more analytical result that indicated a need to evaluate compliance with the CSPA.

Ecology initiated compliance correspondence for 19 metals results. Antimony was the most common subject of compliance assurance (10 results), followed by cobalt (6 results). Ecology sent 12 letters to manufacturers. In most cases (10), the manufacturer was in compliance with the CSPA as the company's annual sales were low enough that reporting was not yet required due to the CSPA reporting rule's[8] phase in schedule. In 2 cases, Ecology assured future compliance by agreeing on a plan to ensure future accurate reports from the manufacturer.

Ecology also identified 2 results from these studies that indicated possible violations of the limits on lead in the CSPA[9]. Manufacturers were notified of these results and Ecology provided the data to the Consumer Product Safety Commission for evaluation of possible federal violations of the Consumer Product Safety Improvement Act (CPSIA).

Conclusions – Metals in Children's Products:

Based on the results discussed above for children's products, the conclusions reached are:

- Cobalt and antimony are found in many products at appreciable levels.
- Lead was found in many products although primarily at low levels.
- A wide range of product types can be analyzed for the metals of concern.
- The metals of concern can be detected at less than 1 ppm levels in most products.

Product Packaging

Packaging from 255 products was broken down into 387 components. All 387 components were scanned using a Niton XL3t 700 XRF Analyzer. Unlike other analyses, fewer packaging samples were sent to the laboratory based upon screening results and as required by the QAPP for this sampling effort (Ecology, 2013e). Only those packaging samples for which screening results indicated the presence of one of the metals of concern were sent to the laboratory for analysis.

Packaging from 24 products (Table 4) was analyzed for ten metals. From these 24 individual packaging items, 25 components were sent for analysis. One product, a Pirate Pencil Case (Figure 1), was separated into two samples of plastic from the sides and the metal zipper. All of the remaining packaging samples were unique.

Washington State toxics in packaging legislation restricts the use of four metals (cadmium, hexavalent chromium, lead, and mercury) in all packaging sold within the state. Analysis for

[8] Specifically, WAC 173-335-110
[9] As per RCW 70.240.020

hexavalent chromium was outside the scope of this project although total chromium results are included. Total chromium results reflect the sum of both hexavalent (Cr^{+6}) and trivalent (Cr^{+3}) chromium found. Cr^{+6} is a known carcinogen (NTP, 2011).

Packaging is not covered by the CSPA but the presence of any of the CHCC metals (antimony, arsenic, cadmium, cobalt, mercury, and molybdenum) could provide an indication if packaging poses a risk to children. In addition to these eight metals, two metals (copper and zinc) currently negatively impacting Puget Sound were included.

Table 4: Product packaging tested for metals

Sample	Item description
BL002-b01	Spider Sense Spider Man Foil Puzzle
CL007-b04	Make up pack
CL007-b04	Make up pack
DT008-b02	Petroleum Jelly
DT021-p01	50 piece princess puzzle in a tin box
DT033-b01	Bedtime Baby Cream
DT036-p01	Baseball set, bases
FM014-p01	Orange glow necklace
FM017-p02	Nerf ammunition
FM028-p04	Play-doh animal bag
SK001-p01	Wow rackets, 2 rackets with ball and birdy
SK002-p02	Turquoise teenage curtain
SK003-p02	Khaki curtain
SK004-p02	White sleep mask
SK006-p02	Princess bouncy ball paddle
TG039-p02	Dog Toys
TG046-p03	Makeup Box
WM003-d01	Bubble Bath
WM004-b01	Color Bath Dropz
WM014-b02	Chocolate peanut butter flavored gloss and chapstick
WM023-p01	Diaper sacks
WM026-p01	Soothing Breast Wipes
WM044-p01	Moist wipes
WM046-b02	Minnie Mouse Pencil Case
WM049-b01	Pirate Pencil Case
WM049-b02	Pirate Pencil Case

The packaging was grouped into four larger categories of baby and bath accessories, cosmetics, miscellaneous (housewares, lip balm, etc.), and toys (Table 5).

Table 5: Breakdown of product packaging into categories

Product Categories	Nr.	%
Baby and bath accessories	7	26.9
Cosmetics	3	11.5
Miscellaneous	6	23.1
Toys	10	38.5

The complete metal analyses are provided in Appendix 2 and a summary is provided below (Table 6). Zinc and copper were the most commonly found metals and zinc had the highest levels observed. Five of the samples ranged between 88% and 96% zinc. Only two samples failed toxics in packaging requirements. One sample, packaging for a set of khaki colored curtains, was near the 100 ppm limit and within laboratory variability. Additional sample analyses would be needed to prove statistically that the concentration is above the 100 ppm limit; therefore, no enforcement action was taken based upon this result.

The second sample, packaging for dog toys, was found to contain lead at 738 ppm, 7 1/3 times the legal limit. The company producing the dog toy was contacted and told of its failure to comply with Washington State law. The packaging is no longer used and additional products from this manufacturer will be purchased to make sure the manufacturer maintains compliance.

Table 6: Breakdown of levels (ppm) of metals found in product packaging

Chemical	ND	%	<1	%	1 to <10	%	10 to <100	%	100 to <1,000	%	1,000 or >	%
Antimony	13	50.0	0	0.0	2	7.7	9	34.6	2	7.7	0	0.0
Arsenic	21	80.8	0	0.0	2	7.7	3	11.5	0	0.0	0	0.0
Cadmium	20	76.9	4	15.4	1	3.8	1	3.8	0	0.0	0	0.0
Chromium	15	57.7	0	0.0	4	15.4	4	15.4	3	11.5	0	0.0
Cobalt	18	69.2	1	3.8	6	23.1	1	3.8	0	0.0	0	0.0
Copper	10	38.5	0	0.0	0	0.0	7	26.9	5	19.2	4	15.4
Lead	16	61.5	0	0.0	0	0.0	8	30.8	2	7.7	0	0.0
Mercury	26	100	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Molybdenum	15	57.7	2	7.7	7	26.9	2	7.7	0	0.0	0	0.0
Zinc	3	11.5	0	0.0	5	19.2	8	30.8	5	19.2	5	19.2

Figure 10 shows metal concentrations found in packaging from baby and bath accessories. Zinc was the most commonly found metal although antimony in packaging from moist baby wipes had the highest observed concentration of 95.8 ppm. The next highest observed concentration was packaging from bath accessories. Overall, metals were found in packaging from numerous products but few contained levels above the 100 ppm concentration allowed for the four metals currently in the Washington toxics in packaging legislation.

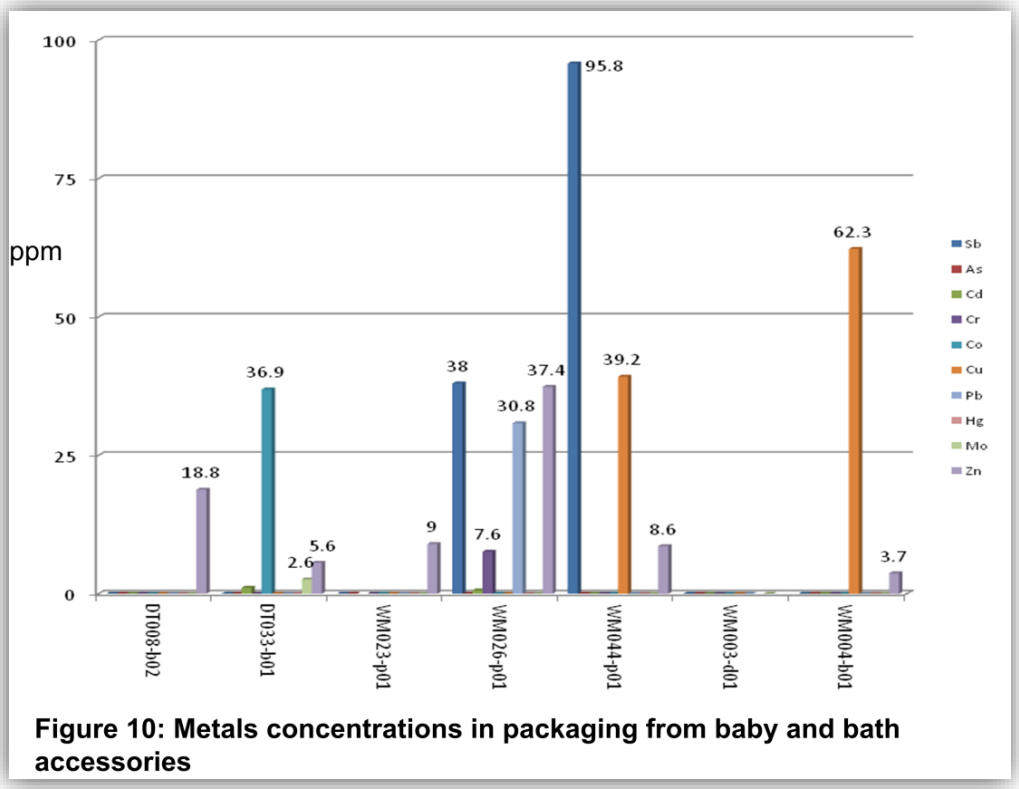

Figure 10: Metals concentrations in packaging from baby and bath accessories

Figure 11 shows metal concentrations found in a very limited survey of cosmetic packaging. Zinc and copper were the most commonly found metal with detections of copper (266 ppm) and zinc (314 ppm) found in a makeup pack and box, respectively. Of the four metals of concern for compliance with the toxics in packaging legislation, only chromium was found above the 100 ppm limit; however, as the limit is only applicable for hexavalent chromium and the reported value of 153 ppm is for both Cr^{+6} and Cr^{+3}, no action could be taken without additional analysis. Small amounts of metals were found in packaging but the levels were low.

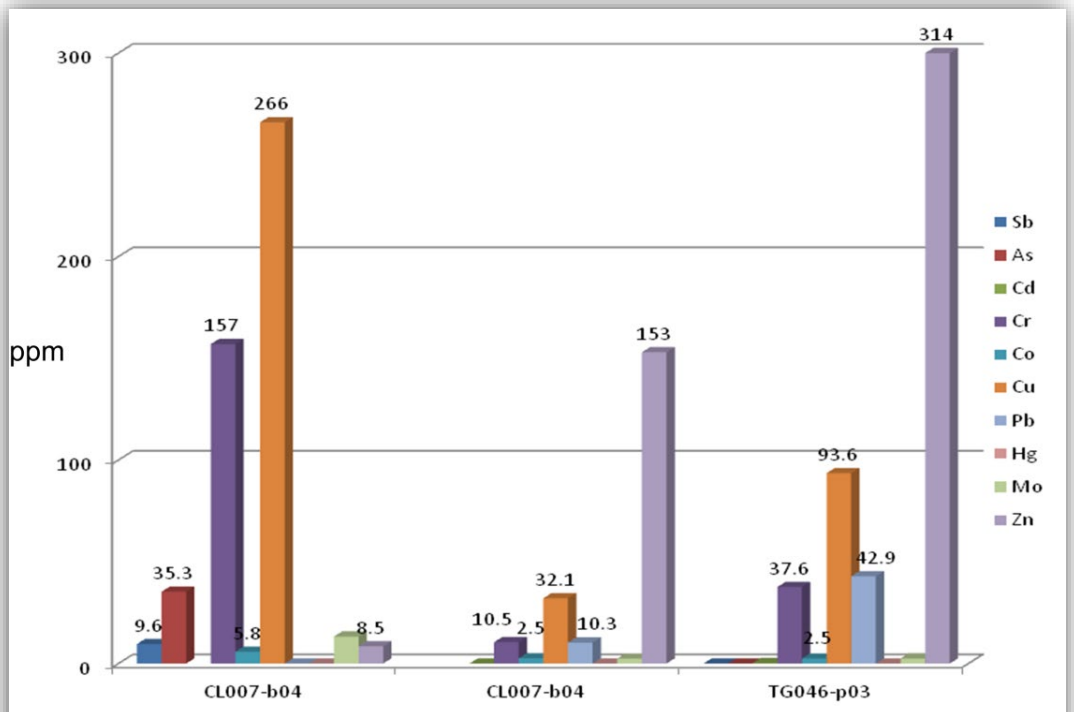

Figure 11: Metals concentrations in packaging from cosmetic products

Figure 12 shows metal concentrations found in packaging from miscellaneous products including housewares (curtain sets), dog toys, a plastic necklace, and a sleep mask. Zinc and copper were detected most frequently and at the highest levels. Zippers from the plastic pouches holding two curtain sets were found to consist primarily of zinc as both had zinc at around 960,000 ppm (96% by weight). Copper and zinc were also found in appreciable concentrations in the 300 to 550 ppm level in packaging from dog toys.

Of the four metals limited by the toxics in packaging legislation, two samples, packaging from dog toys and the khaki colored curtain set, contained lead above the permissible limit. The value for the curtain set (113 ppm) was within laboratory operating error; therefore, no compliance actions were warranted. The value for packaging from dog toys (TG039) was resolved after discussions with the manufacturer. Of the six CHCC metals, antimony was found in appreciable levels in two products and at detectable limits in all the remaining products except the sleep mask packaging. The remaining metals were found at lower levels.

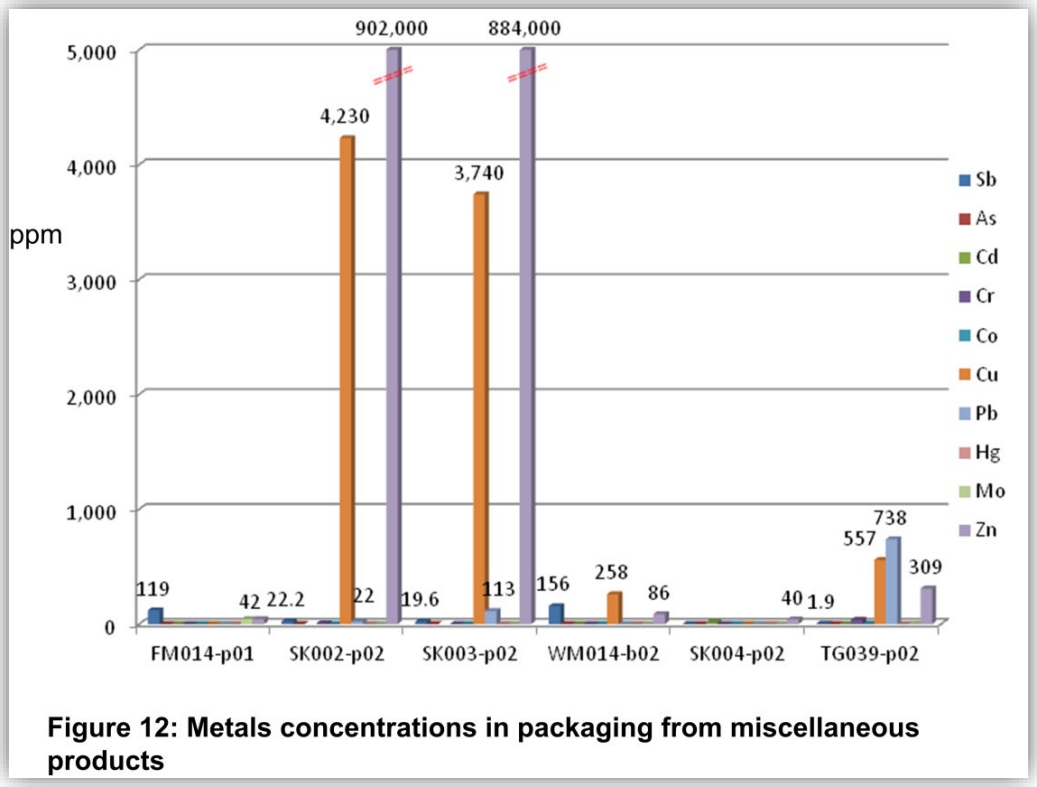

Figure 12: Metals concentrations in packaging from miscellaneous products

Figure 13 shows the metal concentrations found in packaging from toys. Zinc and copper were the most commonly found metal and both had the highest levels. Zippers from the plastic pouches used to contain three toys consisted primarily of zinc as both had zinc ranging from 912,000 (91.2%) to 963,000 (96.3%) ppm. Copper and zinc were also found in appreciable concentrations in the 134 to 400 ppm range.

Of the four metals limited by the toxics in packaging legislation, none of the samples contained metals above the permissible limit. Two samples, a tin box holding a puzzle and a foil puzzle contained appreciable amounts of chromium at 269 and 144 ppm, respectively. As these values, however, are for Cr^{+6} and Cr^{+3}, they do not indicate non-compliance with toxics in packaging legislation without additional analysis.

Of the six CHCC metals, antimony was found in appreciable levels in two products and at detectable levels in all the remaining products. The remaining metals were found in a limited number of samples at lower levels.

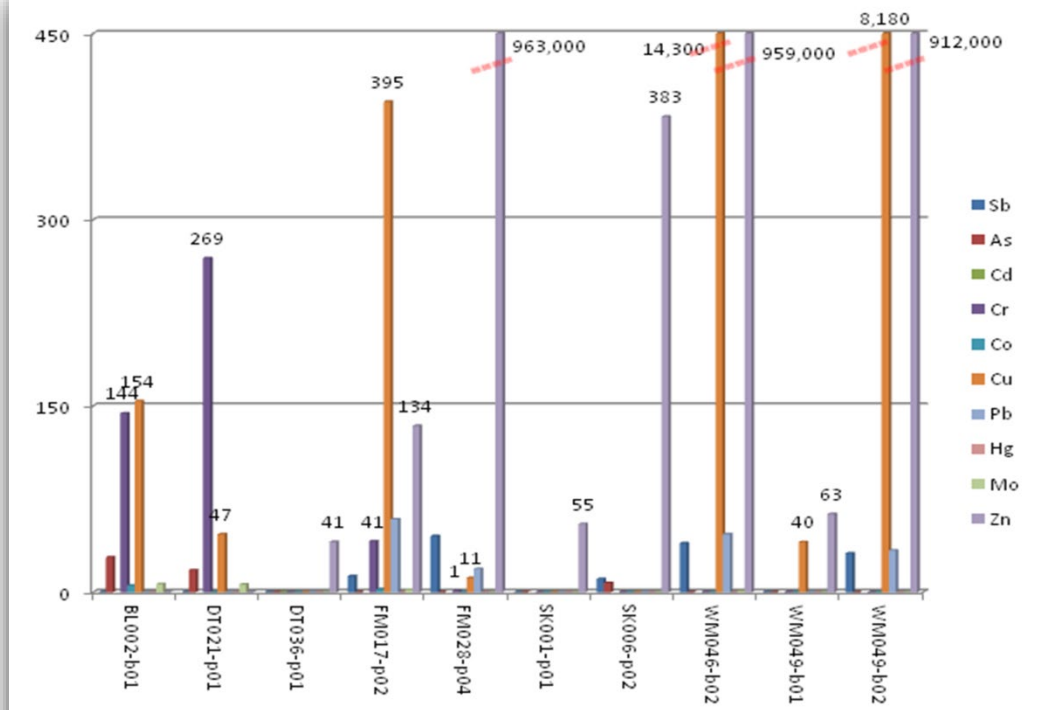

Figure 13: Metals concentrations in packaging from toys

Conclusions - Metals in Product Packaging

Based on the results discussed above for children's products, the following conclusions can be reached:

- Only one sample was found to be out of compliance with toxics in packaging requirements.
- Zinc and copper were found in substantial concentrations and some packaging components were made almost solely out of zinc and copper.
- Antimony and chromium were found in numerous products at substantial concentrations.
- A wide range of product types can be analyzed for the metals of concern.
- The metals of concern can be detected at less than 1 ppm levels in most products.

Metals of Concern to Puget Sound

One hundred and two individual products (Table 7) were analyzed for metals of concern to Puget Sound. From these, 150 individual samples were sent to the laboratory for analysis as some products were separated into multiple individual components. Multiple samples were collected from 32 products and each component is presented separately.

Table 7: Products tested for copper and zinc

Item description	Sample	Item description	Sample
Soft baby toothbrush teether	AM003-c01	Baby looking-alike shoes	ON002-c03
Bumpy raspberry teething pacifier	AM004-c01	Baby looking-alike shoes	ON002-c04
Bumpy raspberry teething pacifier	AM004-c02	Yellow baby mud boots	ON004-c02
Baby tooth brush	AM005-c01	Yellow baby mud boots	ON004-c04
Girls blue jeans	AM010-c01	Halloween Makeup variety pack	RA000-c04
Girls blue jeans	AM010-c02	Halloween Makeup variety pack	RA000-c06
Boys jeans, button up & sweater	AM011-c01	Halloween Makeup variety pack	RA000-c13
Boys jeans, button up & sweater	AM011-c02	Mom to mom supreme unscented wipes	SF002-c01
Boys jeans, button up & sweater	AM011-c03	Fake gold teeth from quarter machine	SF004-c01
Boys jeans, button up & sweater	AM011-c05	White face powder	SH001-c01
5 Boys onesies	AM012-c02	Face Painting Kit	SH003-c06
3 Onesies	AM013-c02	Face Painting Kit	SH003-c08
Jeans & Jacket	AM014-c02	Face Painting Kit	SH003-c09
Jeans & Jacket	AM014-c03	Face Painting Kit	SH003-c10
Jeans & Jacket	AM014-c04	Family Value Makeup kit	SH004-c01
Jeans & Jacket	AM014-c05	Family Value Makeup kit	SH004-c02
Onesie & Overalls	AM015-c02	Family Value Makeup kit	SH004-c09

Item description	Sample	Item description	Sample
Onesie & Overalls	AM015-c03	Family Value Makeup kit	SH004-c10
Overalls	AM016-c01	12 roll-on lip glosses	SK019-c03
Overalls	AM016-c02	Monster High Makeup kit	SK020-c01
Girls Blue Jeans size 3	AM017-c01	Baby Shoes	SP000-c02
Girls Blue Jeans size 3	AM017-c03	Baby Sandals	SP001-c01
Girls blue jeans	AM018-c01	Baby Sandals	SP001-c02
Boys jeans, t-shirt & jacket	AM019-c01	Baby Sandals	SP001-c03
Boys jeans, t-shirt & jacket	AM019-c02	Baby Sandals	SP001-c04
Boys jeans, t-shirt & jacket	AM019-c05	Pacifier	SP002-c01
Boys jeans, t-shirt & jacket	AM019-c06	2 Pacifier set	TG000-c01
Girls Jeans	AM020-c01	2 Fresh food feeders	TG007-c01
Girls Jeans	AM020-c02	2 Pacifier set	TG010-c01
Girls Jeans	AM021-c01	Contact nipple shield	TG013-c01
Girls Jeans	AM021-c02	Wide base nipples	TG014-c01
Girls Jeans	AM021-c03	Ernie book	TG017-c01
Glitter girl Glitz Nails	BL000-c01	2 Pacifier set	TG018-c01
Spider Sense Spider Man Foil Puzzle	BL002-b01	HPA lanolin	TG020-c01
Hello Kitty Ring	CL000-c01	Assorted play-doh	TG022-c01
Hello Kitty Ring	CL000-c02	Space footie pajamas	TG023-c03
Tangled Flavored Lip Gloss 4 pack	CL001-c03	Body Wash - Vanilla Swirl	TG062-c02
Tangled Flavored Lip Gloss 4 pack	CL001-c09	Silicone nipples	TR000-c01
Nerds scented nail polish pack	CL003-c01	Sesame Street toothbrush	TR001-c01
Hello Kitty Nail Polish Pack	CL004-c01	Sesame Street toothbrush	TR001-c02
Hello Kitty Ring	CL005-c02	Toddler wipes	TR002-c01
Make up pack	CL007-b04a	Pacifier	TR005-c02
Make up pack	CL007-b04b	Girly temp tattoos	TR006-c01
Pink Coin Purse	CL008-c02	Boy temp tattoos	TR007-c01
Lip gloss set	CL009-b02	Pink teething ring	TR009-c01
Tummy play pad	CT001-c02	Mesh food sacks	TR011-c01
3 Pack silicone nipples	DT000-c01	Dr. Suess bib	TR012-c01
Changeable Gem pendant	DT003-c05	Travel baby wipes	TR014-c01
Changeable Gem pendant	DT003-c06	Pee protector with basketball motif	TR022-c02
Dream Bride Wedding Day variety pack	DT004-c03	Baby Wash	WG004-c01
Disposable baby bibs	DT005-c01	Color Bath Dropz	WM004-b01
Colored moldable "play" dough	DT006-c01	Color Bath Dropz	WM004-c03
Colored moldable "play" dough	DT006-c02	Small baby bottle	WM005-c01
Petroleum Jelly	DT008-b02	Squishy book	WM008-c01

Item description	Sample	Item description	Sample
Bedtime Baby Cream	DT033-b01	Basketball pacifiers	WM009-c01
Orange stuffed fish	DT041-c01	Princess keychain & chapsticks	WM010-c04
3 Baby spoons	FM002-c02	Soothie pacifier	WM012-c01
Scented neon nail polish set	FM003-c01	Chocolate flavored gloss & chapstick	WM014-b02
Face paint crayons	FM004-c01	Chocolate flavored gloss & chapstick	WM014-c01
Baby powder	FM006-c01	Pink bib	WM015-c01
Princess lip balm & keychain in tube	FM007-c02	Pink baby ballet slippers	WM020-c01
Princess lip balm & keychain in tube	FM007-c04	Pink baby ballet slippers	WM020-c02
2 Pacifier set	FM010-c01	Sponge Bob briefs	WM033-c03
Pink plastic recorder	FM030-c01	Minnie Mouse Pencil Case	WM046-b02
Maroon Gem earrings	IC000-c01	Pirate Pencil Case	WM049-b01
Plastic earrings - 6 pairs	IC001-c01	Pirate Pencil Case	WM049-b02
Plastic earrings - 9 pairs	IC002-c01	Mickey Mouse undies	WM050-c02
Plastic earrings - 9 pairs	IC002-c02	2 Wooden whistles	WM052-c02
Butterfly ring	IC003-c02	4 Lip glosses with zipper pouch	WM053-c01
Butterfly ring	IC003-c03	"How to" DVD Makeup Kit	WM056-c08
White Tennis Shoes & bib	JN000-c01	"How to" DVD Makeup Kit	WM056-c09
White Tennis Shoes & bib	JN000-c02	Monster Value Makeup Set	WM058-c01
White Tennis Shoes & bib	JN000-c03	Monster Value Makeup Set	WM058-c04
Tennis Shoes	JN001-c01	Monster Value Makeup Set	WM058-c11
Baby looking-alike shoes	ON002-c02	Water based make up	WM062-c03

Products were grouped into eight larger categories of baby and bath accessories, clothing, cosmetics, footwear, Halloween products (makeup), jewelry, lip balm, and toys (Table 8).

Table 8: Breakdown of products into categories

Category	#	%
Baby and bath accessories	39	26.0
Clothing	31	20.7
Cosmetics	14	9.3
Footwear	16	10.7
Halloween accessories	20	13.3
Jewelry	13	8.7
Lip balm	8	5.3
Toys	9	6.0

Emphasis was placed upon products that are likely to be placed into the mouth or applied to the skin, which accounts for the larger number of samples of baby and bath accessories and lip

balms and glosses. In addition, sampling occurred prior to Halloween in 2012 and several samples of Halloween products were collected and analyzed as likely to be applied to a child's skin during the holiday. In general terms, high levels of copper and zinc were found in several samples.

Zinc was more often found and at higher concentrations than copper in the product components tested (Table 9) as evidenced by the greater number of products containing zinc than copper at concentrations greater than 100,000 ppm at 19 and 9, respectively. In addition, the number of components containing copper at less than 1 ppm was greater than zinc with 31 and 1, respectively. The complete packaging analytical results are available in Appendix 3.

Table 9: Breakdown of copper and zinc found in product components

Sample range (ppm)	Cu	%	Zn	%
>100,000	9	6.1	19	12.6
1,000 to 100,000	18	12.2	11	7.3
100 to 1,000	12	8.1	20	13.2
10 to 100	14	9.5	33	21.9
1 to 10	44	29.7	45	29.8
< 1	31	20.9	1	0.7
ND	20	13.5	22	14.6

To better clarify which type of products contained the highest levels of copper and zinc, the sampling results were separated into eight categories:

1. Baby and bath accessories, (Figure 14)
2. Clothing, (Figure 15)
3. Cosmetics and fragrances, (Figure 16)
4. Footwear, (Figure 17)
5. Halloween accessories, (Figure 18)
6. Jewelry, (Figure 19)
7. Lip balm and gloss, (Figure 20)
8. Toys, Figure 21)

Figure 14 shows copper and zinc concentrations found in baby and bath accessories. A toothbrush contained high levels of copper and zinc at 8,300 (0.83%) and 51,800 (5.18%) ppm, respectively. Two other products contained appreciable levels of zinc, specifically a Tummy Play Pad (6,700 ppm) and Fresh Food Feeders (9,640 ppm). The remaining baby and bath accessories had relatively low levels of copper and zinc.

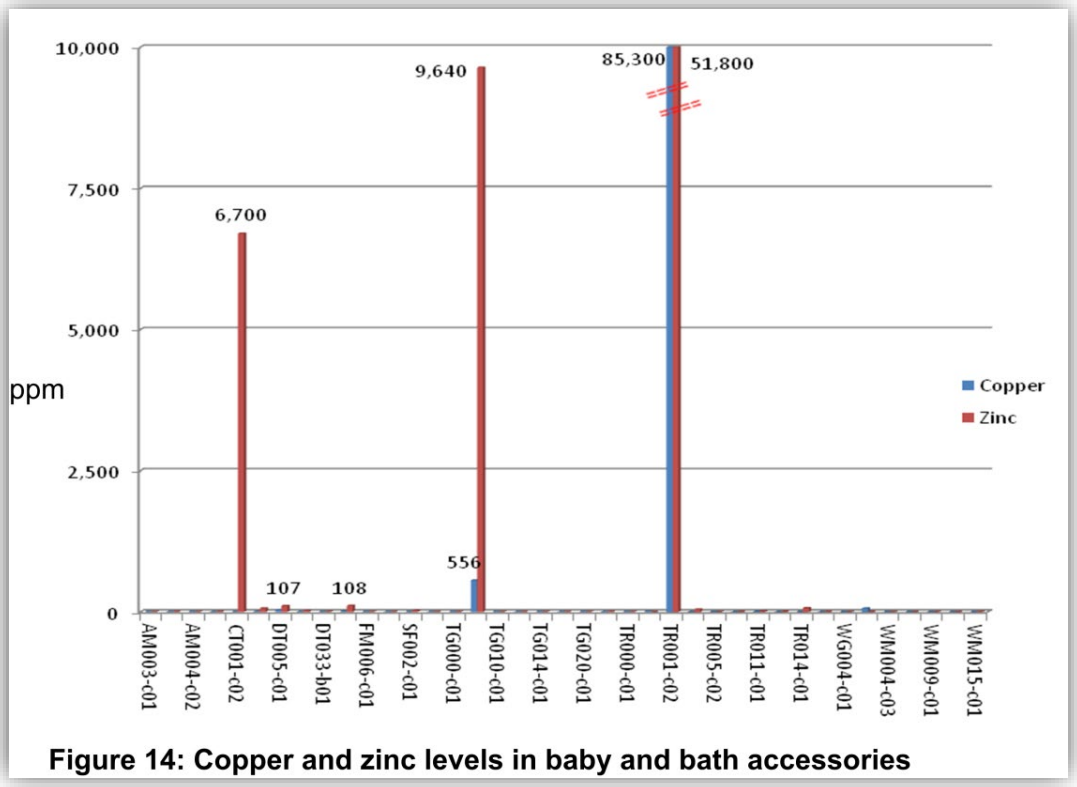

Figure 14: Copper and zinc levels in baby and bath accessories

Figure 15 shows copper and zinc concentrations found in clothing. Twelve of the 31 clothing samples were primarily metal alloys of zinc and copper[10]. These twelve samples were metal buttons or zippers. Two other samples had appreciable levels of copper and zinc. A button from a pair of jeans contained copper and zinc at 44,000 (4.4%) and 8,670 (0.867%) ppm, respectively. A white pair of children's underwear contained zinc at 1,800 (0.18%) ppm. The remaining samples contained trace levels of both metals.

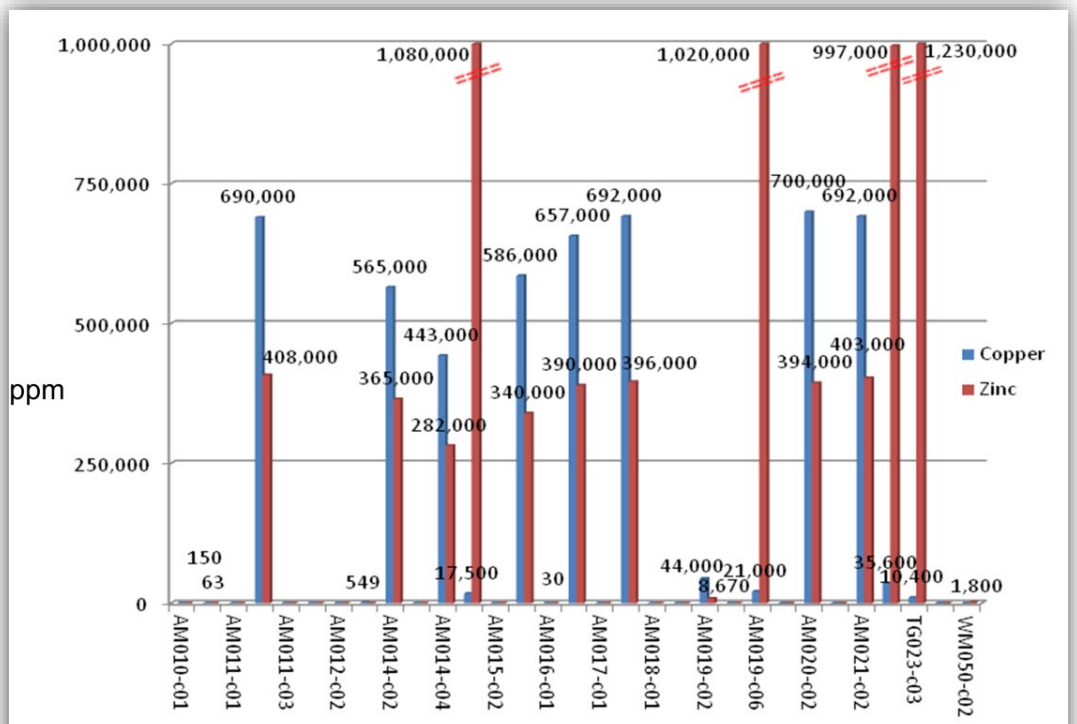

Figure 15: Copper and zinc levels in clothing

[10] Note: Because of variability inherent in chemical analyses, any sample that is ±25% of 1,000,000 ppm is likely to be primarily of that metal. Therefore, copper or zinc analytical results could be as high as 1,250,000 ppm if the product component is made of the metal of interest.

Figure 16 shows copper and zinc concentrations found in cosmetics. Only one sample, a zipper pull from a plastic package, was constructed primarily of zinc at 1,090,000 (109%) ppm. The remaining samples contained much lower levels of both metals with the next greatest being a plastic box used to contain cosmetics with 266 ppm copper and 153 ppm zinc.

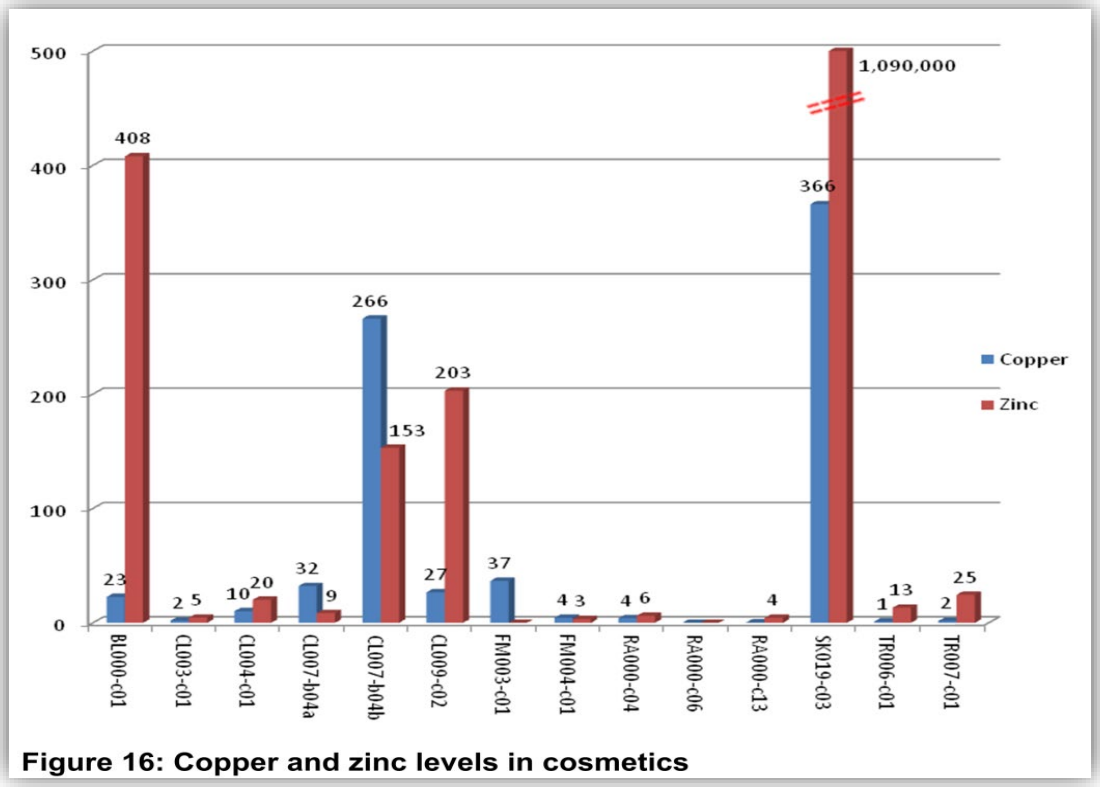

Figure 16: Copper and zinc levels in cosmetics

Figure 17 shows copper and zinc concentrations found in footwear. Two samples had appreciable levels of zinc and copper. The highest, a shoe insert, contained zinc at 16,000 (1.6%) ppm. The second, a metal grommet used in baby shoes, contained copper at 14,000 (1.4%) ppm. Three other samples contained zinc above 5,000 (0.5%) ppm. Those three included a sole sample from baby sandals (5,379 ppm or 0.537%), an insole sample from yellow baby mud boots (4,090 ppm or 0.409%) and a shoe insert used in pink baby ballet slippers (4,040 ppm or 0.404%). The remaining samples had substantially lower levels although all samples were found to contain some copper or zinc.

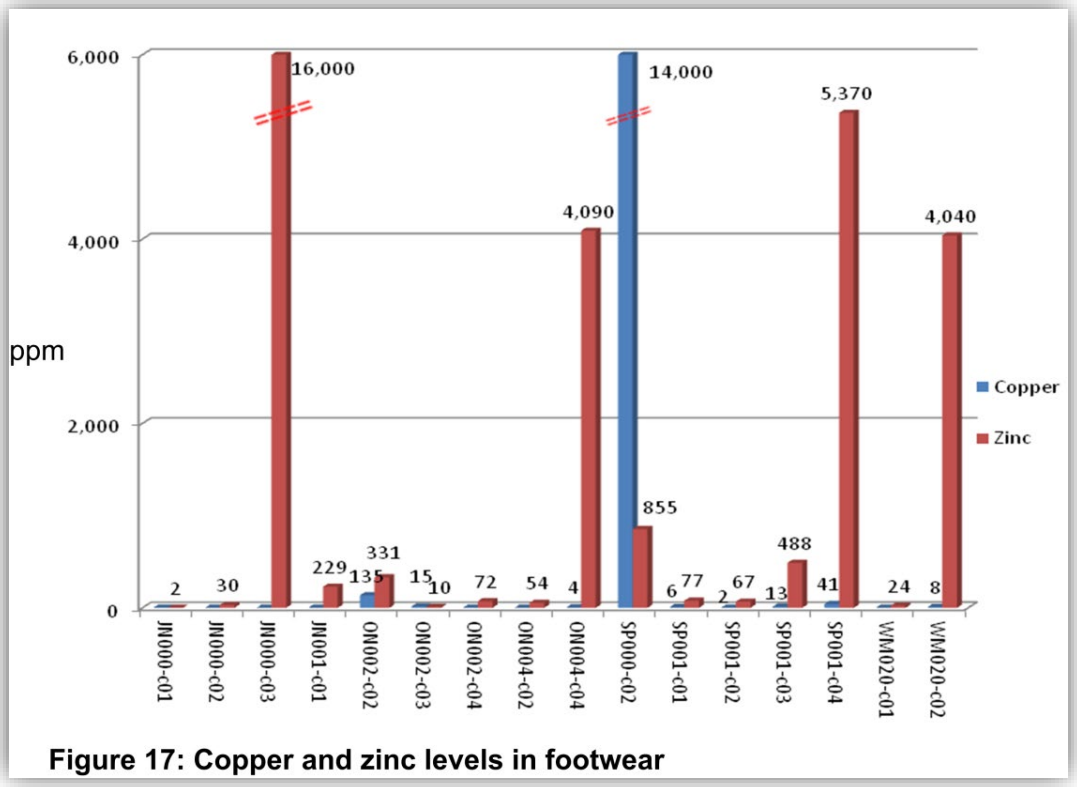

Figure 17: Copper and zinc levels in footwear

Figure 18 shows copper and zinc concentrations found in Halloween accessories. Two samples, both zipper pulls, were made primarily of zinc with levels of 912,000 (91.2%) and 959,000 (95.9%) ppm. The remaining samples had comparatively lower levels of metal with the next highest value found in a composite sample of three black crayons that contained 329 ppm zinc.

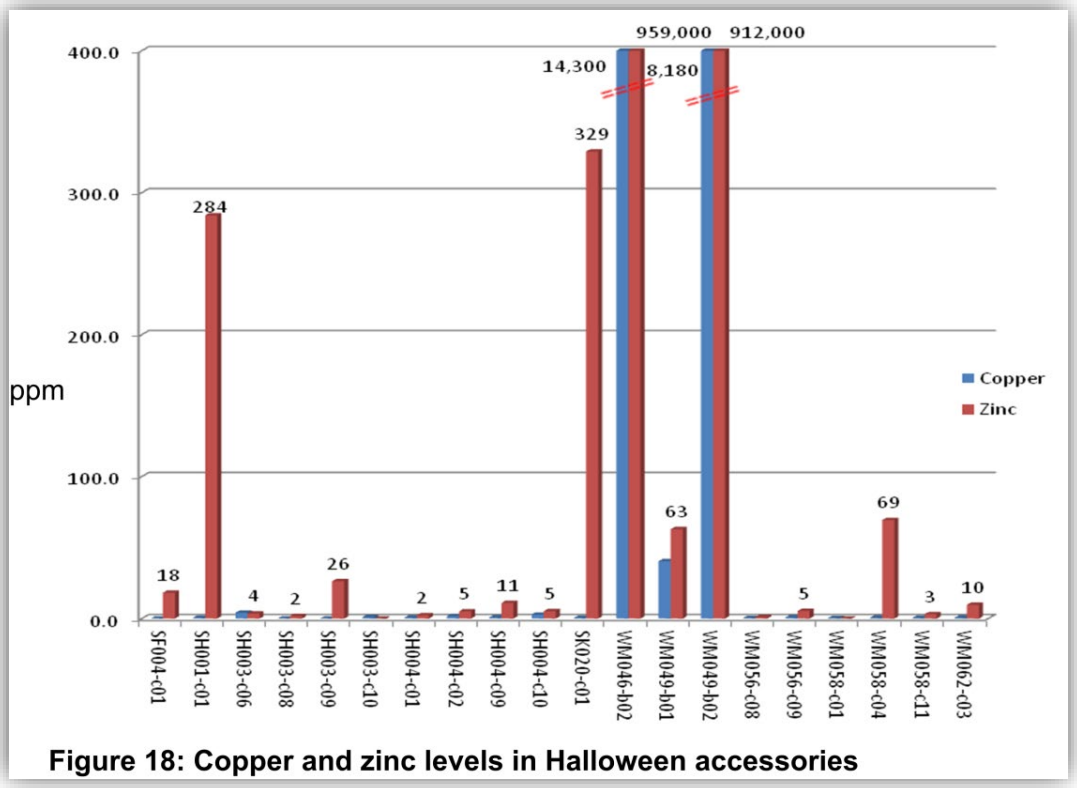

Figure 18: Copper and zinc levels in Halloween accessories

Figure 19 shows copper and zinc concentrations found in jewelry samples. Four samples, individual jewelry parts, were made primarily of zinc with levels ranging between 981,000 (98.1%) and 1,260,000 (126%) ppm. Several other samples contained either zinc or copper above 10,000 ppm (1%) including beads (144,000 ppm or 14.4% Cu), an earring backing (66,100 ppm or 6.61% Cu) and a ring backing (80,900 ppm or 8.09% Cu). Overall, copper and zinc were found in all jewelry tested.

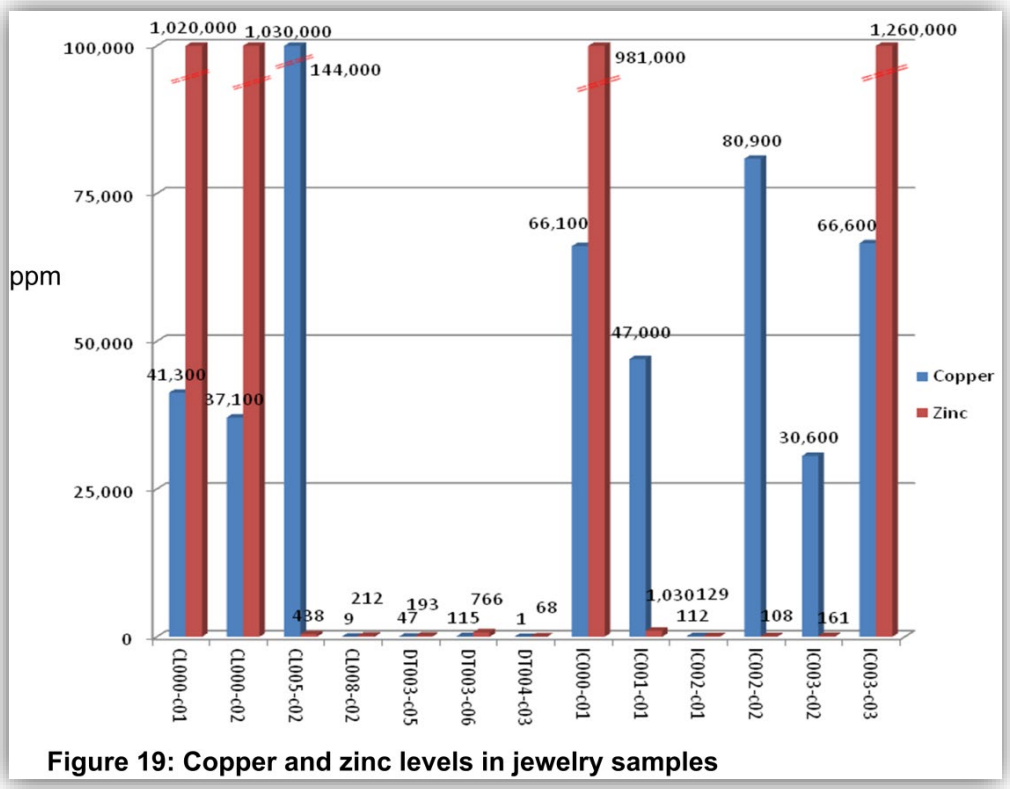

Figure 19: Copper and zinc levels in jewelry samples

Figure 20 shows copper and zinc concentrations found in lip balm components. Two samples, both the metal chain portions of key chains, contained appreciable levels of copper at 43,200 (4.32%) and 38,300 (3.83%) ppm. Lower levels of copper were found in lip balm composite samples at 258 and 119 ppm. The remaining samples had only trace levels of copper and zinc.

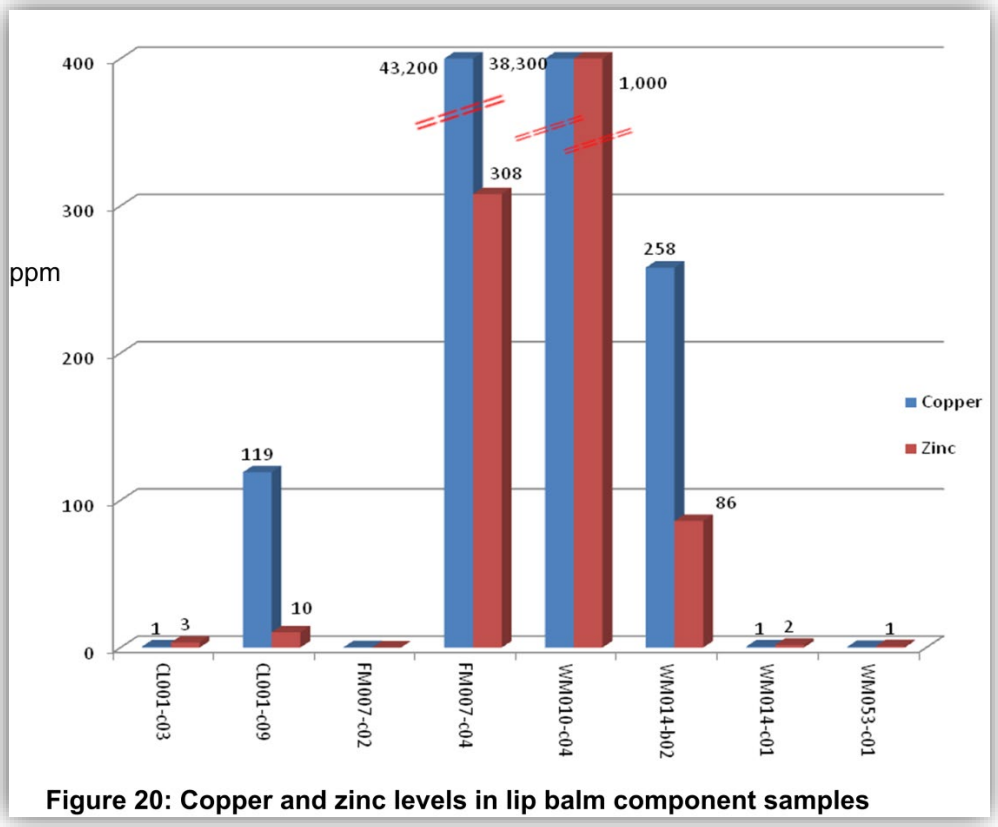

Figure 20: Copper and zinc levels in lip balm component samples

Figure 21 shows copper and zinc concentrations found in toys. Only low levels of copper and zinc were found in the limited toys sampled. The highest concentrations observed were 154 ppm copper found in puzzle box lid and 151 ppm found in a plastic whistle body. The remaining samples had much lower to trace levels of both metals.

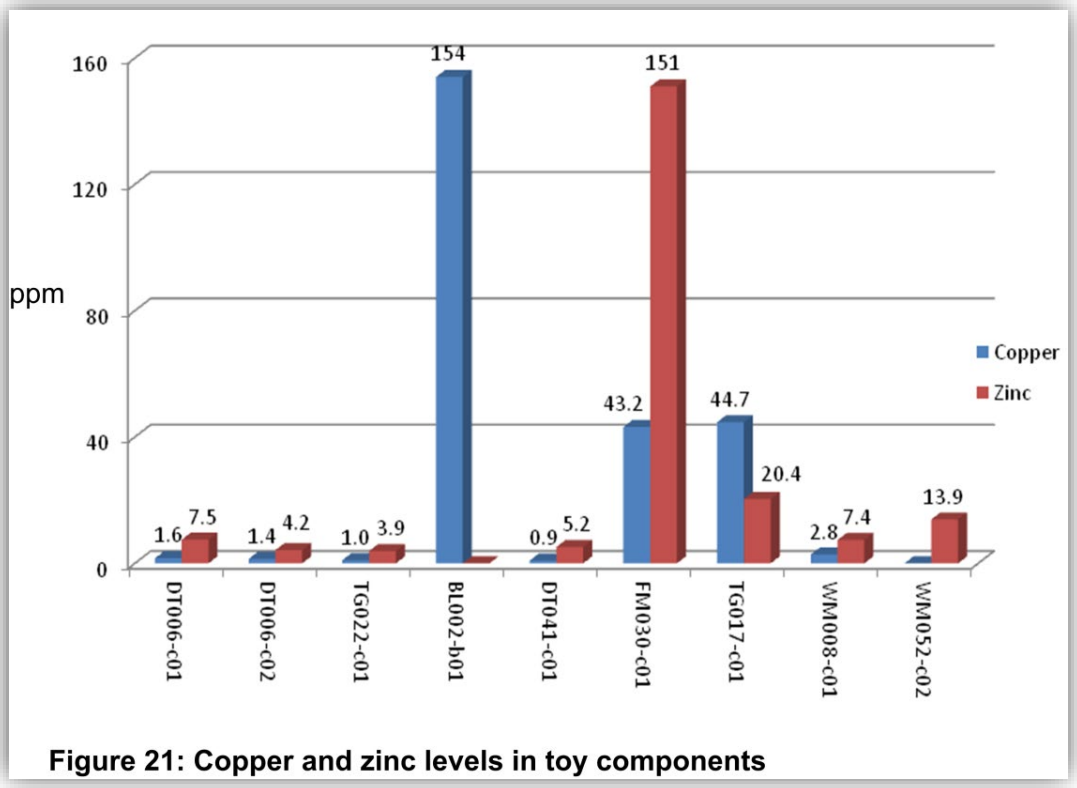

Figure 21: Copper and zinc levels in toy components

Conclusions - Metals of concern to Puget Sound:

Based on the results discussed above for children's products, the following conclusions can be reached:

- Appreciable levels of copper and zinc were found in most product categories with particularly high levels found in clothing.
- Zinc and copper were found in substantial concentrations and some product components like buttons and zippers were made primarily of copper and zinc.
- A wide range of product types can be analyzed for the metals of concern.
- The metals of concern can be detected at less than 1 ppm in most products.

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Appendix 1: Data from analysis of children's products for metals

Baby and Bath Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Soft baby toothbrush teether	AM003-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bumpy raspberry teething pacifier	AM004-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bumpy raspberry teething pacifier	AM004-c02	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Baby tooth brush	AM005-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tummy play pad	CT001-c02	36.9	0.0	0.2	0.0	0.4	0.8	0.0	0.0
3 Pack silicone nipples	DT000-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disposable baby bibs	DT005-c01	0.0	0.0	0.0	1.1	0.0	0.5	0.0	0.0
Petroleum Jelly	DT008-b02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bedtime Baby Cream	DT033-b01	0.0	0.0	1.1	0.0	36.9	0.0	0.0	2.6
3 Baby spoons	FM002-c02	0.2	0.0	0.0	13,600.0	3.0	0.0	0.3	0.0
Baby powder	FM006-c01	0.0	0.0	0.0	2.2	0.4	0.4	0.0	0.2
2 Pacifier set	FM010-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Mom to mom supreme unscented wipes	SF002-c01	70.6	0.0	0.0	0.6	0.2	0.4	0.0	0.0
Pacifier	SP002-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Pacifier set	TG000-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Fresh food feeders	TG007-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Pacifier set	TG010-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contact nipple shield	TG013-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wide base nipples	TG014-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Pacifier set	TG018-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HPA lanolin	TG020-c01	0.1	0.0	0.0	1.4	0.0	0.0	0.0	0.0
Body Wash - Vanilla Swirl	TG062-c02	55.5	0.0	0.0	0.4	0.1	0.3	0.0	0.0
Silicone nipples	TR000-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sesame Street toothbrush	TR001-c01	0.0	0.0	0.0	2.8	0.7	0.0	0.0	0.0
Sesame Street toothbrush	TR001-c02	0.0	0.0	0.1	0.7	0.0	0.9	0.2	0.0

Baby and Bath Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Toddler wipes	TR002-c01	61.3	0.0	0.0	0.5	0.0	0.8	0.0	0.0
Pacifier	TR005-c02	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Pink teething ring	TR009-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mesh food sacks	TR011-c01	72.1	0.0	0.0	0.5	0.1	0.5	0.0	0.0
Dr. Suess bib	TR012-c01	116.0	0.0	0.0	0.5	0.1	0.2	0.0	0.0
Travel baby wipes	TR014-c01	40.6	0.0	0.0	0.6	1.4	1.4	0.0	0.0
Pee protector with basketball motif	TR022-c02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Baby Wash	WG004-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Color Bath Dropz	WM004-b01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Color Bath Dropz	WM004-c03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Small baby bottle	WM005-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Basketball pacifiers	WM009-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soothie pacifier	WM012-c01	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Pink bib	WM015-c01	99.6	0.0	0.0	0.7	0.0	0.2	0.0	0.0

Clothing	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Girls blue jeans	AM010-c01	0.0	0.0	0.0	1.0	0.1	0.4	0.0	0.0
Girls blue jeans	AM010-c02	3.9	22.4	0.1	257.0	24.2	2.1	0.0	24.7
Boys jeans, button up and sweater	AM011-c01	2.9	0.0	0.0	4.1	0.0	0.5	0.0	0.0
Boys jeans, button up and sweater	AM011-c02	0.7	0.0	1.5	1.0	459.0	13.8	0.0	0.0
Boys jeans, button up and sweater	AM011-c03	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Boys jeans, button up and sweater	AM011-c05	63.6	0.0	0.0	0.0	0.0	0.1	0.0	0.0
5 Boys Onesies	AM012-c02	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
3 Onesies	AM013-c02	0.0	0.0	0.0	0.4	0.0	0.4	0.0	0.2
Jeans and Jacket	AM014-c02	9.6	4.0	0.7	0.0	28.5	17.7	0.0	0.0
Jeans and Jacket	AM014-c03	121.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Jeans and Jacket	AM014-c04	0.9	0.0	1.8	0.0	189.0	14.2	0.0	0.0

Clothing	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Jeans and Jacket	AM014-c05	0.0	4.1	9.2	0.0	184.0	27.1	0.0	0.0
Onesie and Overalls	AM015-c02	55.1	0.0	0.0	1.3	0.9	1.8	0.0	0.0
Onesie and Overalls	AM015-c03	1.2	0.0	4.1	0.0	321.0	23.4	0.0	0.0
Overalls	AM016-c01	0.3	0.0	0.0	0.7	0.0	0.3	0.0	0.0
Overalls	AM016-c02	1.9	0.0	3.1	0.0	1.6	68.2	0.0	0.4
Girls Blue Jeans size 3	AM017-c01	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Girls Blue Jeans size 3	AM017-c03	1.1	4.4	4.5	0.0	100.0	69.7	0.0	0.3
Girls blue jeans	AM018-c01	53.0	0.0	0.0	23.2	0.2	0.3	0.0	0.0
Boys jeans, t-shirt and jacket	AM019-c01	8.2	0.0	0.0	0.8	0.1	1.2	0.0	0.0
Boys jeans, t-shirt and jacket	AM019-c02	3.5	19.5	0.2	242.0	560.0	3.2	0.0	5.8
Boys jeans, t-shirt and jacket	AM019-c05	128.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0
Boys jeans, t-shirt and jacket	AM019-c06	1.3	4.4	2.2	2.8	0.5	25.9	0.0	0.0
Girls Jeans	AM020-c01	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Girls Jeans	AM020-c02	2.0	4.2	0.2	1.4	0.5	16.9	0.0	0.0
Girls Jeans	AM021-c01	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0
Girls Jeans	AM021-c02	3.0	3.5	0.1	0.0	0.3	20.1	0.0	0.0
Girls Jeans	AM021-c03	0.0	3.1	1.9	0.0	77.3	28.1	0.0	0.0
Space footie pajamas	TG023-c03	0.0	7.7	2.6	0.0	0.0	18.4	2.8	0.0
Sponge Bob briefs	WM033-c03	0.2	0.0	0.1	0.5	0.0	0.1	0.0	0.3
Mickey Mouse undies	WM050-c02	24.1	0.0	0.0	0.3	0.4	0.2	0.0	0.0

Cosmetics and Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Glitter girl Glitz Nails	BL000-c01	0.4	0.0	0.3	9.1	22.2	3.8	0.0	0.0
Nerds scented nail polish pack	CL003-c01	0.0	0.0	0.0	0.8	0.0	0.1	0.0	0.8
Hello Kitty Nail Polish Pack	CL004-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Make up pack	CL007-b04	3.1	0.0	NA	10.5	2.5	0.0	0.0	2.5
Make up pack	CL007-b04	9.6	35.3	0.0	157.0	5.8	10.3	0.0	13.3

Cosmetics and Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Lip gloss set	CL009-b02	0.0	0.0	0.0	10.0	2.4	15.8	0.0	3.0
Scented neon nail polish set	FM003-c01	0.3	0.0	0.0	0.7	0.0	0.3	0.0	0.0
Face paint crayons	FM004-c01	0.3	0.0	0.0	1.6	0.2	0.7	0.0	0.0
12 Roll-on lip glosses	SK019-c03	0.0	5.7	1.1	0.0	0.0	23.2	0.0	0.0
Girly temp tattoos	TR006-c01	0.3	0.0	0.0	0.9	0.2	0.2	0.0	0.2
Boy temp tattoos	TR007-c01	22.3	0.0	0.0	1.7	0.3	0.3	0.0	0.1

Footwear	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
White Tennis Shoes and bib	JN000-c01	1.0	0.0	0.0	1.0	2.0	0.2	0.0	0.0
White Tennis Shoes and bib	JN000-c02	65.2	0.0	0.1	0.5	4.0	0.3	0.0	0.4
White Tennis Shoes and bib	JN000-c03	73.1	0.0	0.1	2.5	0.1	1.2	0.0	0.0
Tennis Shoes	JN001-c01	1.7	0.0	0.1	0.7	0.2	1.1	0.0	0.0
Baby looking-alike shoes	ON002-c02	6.3	0.0	0.1	111.0	1.9	172.0	0.0	2.4
Baby looking-alike shoes	ON002-c03	29.0	0.0	0.0	0.5	0.1	0.2	0.0	0.0
Baby looking-alike shoes	ON002-c04	34.3	0.0	0.0	1.0	1.5	0.5	0.0	0.0
Yellow baby mud boots	ON004-c02	117.0	0.0	0.0	1.3	3.4	0.5	0.0	0.0
Yellow baby mud boots	ON004-c04	3.9	0.0	0.2	3.7	0.3	4.3	0.0	0.0
Baby Shoes	SP000-c02	1.6	23.0	0.0	299.0	61.3	2.3	0.0	14.9
Baby Sandals	SP001-c01	58.7	0.0	0.1	1.9	1.2	5.3	0.0	0.0
Baby Sandals	SP001-c02	0.0	0.0	0.0	4.8	0.1	0.8	0.0	0.0
Baby Sandals	SP001-c03	35.7	0.0	0.1	3.2	1.9	7.9	0.0	0.0
Baby Sandals	SP001-c04	0.8	0.0	0.5	15.5	0.3	44.6	0.0	0.2
Pink baby ballet slippers	WM020-c01	0.9	0.0	0.1	1.5	1.7	1.7	0.0	0.0
Pink baby ballet slippers	WM020-c02	17.2	0.0	1.5	2.6	0.2	7.1	0.0	0.1

Halloween Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Halloween Makeup variety pack	RA000-c04	0.1	0.0	0.0	1.0	1.7	0.2	0.0	0.0

Halloween Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Halloween Makeup variety pack	RA000-c06	0.0	0.0	0.0	0.5	0.1	0.1	0.0	0.2
Halloween Makeup variety pack	RA000-c13	0.1	0.0	0.0	85.3	2.2	0.1	0.0	0.3
Fake gold teeth from quarter machine	SF004-c01	0.0	0.0	NA	0.0	29.1	0.0	0.0	0.0
White face powder	SH001-c01	0.2	0.0	0.1	2.0	0.2	0.5	0.0	0.2
Face Painting Kit	SH003-c06	0.4	0.0	0.0	2.0	0.1	0.2	0.0	0.0
Face Painting Kit	SH003-c08	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Face Painting Kit	SH003-c09	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Face Painting Kit	SH003-c10	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family Value Makeup kit	SH004-c01	0.0	0.0	0.0	3.0	0.7	0.6	0.0	0.1
Family Value Makeup kit	SH004-c02	0.0	0.0	0.0	2.0	1.3	0.4	0.0	0.0
Family Value Makeup kit	SH004-c09	0.0	0.0	0.0	7.0	3.1	0.3	0.0	0.0
Family Value Makeup kit	SH004-c10	0.4	0.0	0.0	0.9	0.1	0.3	0.0	0.0
Monster High Makeup kit	SK020-c01	0.0	0.0	0.0	2.4	3.8	0.1	0.0	0.0
Minnie Mouse Pencil Case	WM046-b02	39.4	0.0	NA	0.0	0.0	46.7	0.0	0.9
Pirate Pencil Case	WM049-b01	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0
Pirate Pencil Case	WM049-b02	31.3	0.0	NA	0.0	0.0	33.7	0.0	0.0
"How to" DVD Makeup Kit	WM056-c08	0.0	0.0	0.0	0.3	0.1	0.7	0.0	0.2
"How to" DVD Makeup Kit	WM056-c09	0.0	0.0	0.0	31.8	1.7	0.8	0.0	0.1
Monster Value Makeup Set	WM058-c01	0.2	0.0	0.0	3.0	0.0	0.3	0.0	0.3
Monster Value Makeup Set	WM058-c04	0.0	0.0	0.0	1.9	13.7	0.0	0.0	0.0
Monster Value Makeup Set	WM058-c11	0.2	0.0	0.0	2.0	0.9	0.7	0.0	0.2
Water based make up	WM062-c03	0.0	0.0	0.1	2.1	0.2	0.4	0.0	0.0

Jewelry and Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Hello Kitty Ring	CL000-c01	0.0	10.9	3.9	5.8	0.2	22.8	0.0	0.0
Hello Kitty Ring	CL000-c02	0.0	13.5	4.4	0.0	0.0	34.4	0.0	0.0
Hello Kitty Ring	CL005-c02	189.0	1.3	5.6	14.9	0.3	19.9	0.0	0.0

Jewelry and Accessories	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Pink Coin Purse	CL008-c02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Changeable Gem pendant	DT003-c05	20.3	0.0	1.8	5.0	5.6	37.1	0.0	0.4
Changeable Gem pendant	DT003-c06	219.0	18.1	42.5	7.0	8.2	134.0	0.0	1.1
Dream Bride Wedding Day variety pack	DT004-c03	0.9	0.0	0.0	0.0	2.6	0.1	0.0	0.0
Maroon Gem earrings	IC000-c01	0.1	5.9	5.3	5.8	30.7	19.4	0.0	0.0
Plastic earrings - 6 pairs	IC001-c01	7.4	19.6	0.0	133.0	34.1	2.6	0.0	5.3
Plastic earrings - 9 pairs	IC002-c01	0.6	0.0	0.0	441.0	1.0	6.3	0.0	0.9
Plastic earrings - 9 pairs	IC002-c02	14.2	125.0	2.6	266.0	92.9	2.3	0.0	54.6
Butterfly ring	IC003-c02	4.7	89.1	0.0	432.0	80.1	1.6	0.0	89.0
Butterfly ring	IC003-c03	0.0	0.0	2.6	11.6	1.9	14.9	0.0	1.5

Lip Balm	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Tangled Flavored Lip Gloss 4 pack	CL001-c03	2.4	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Tangled Flavored Lip Gloss 4 pack	CL001-c09	25.9	38.1	NA	91.0	19.0	0.0	0.0	4.3
Princess lip balm and keychain in tube	FM007-c02	0.2	0.0	0.0	1.4	0.0	0.1	0.0	0.0
Princess lip balm and keychain in tube	FM007-c04	3.1	72.5	0.0	350.0	56.5	33.2	0.0	5.8
Princess keychain and chapsticks	WM010-c04	19.5	276.0	0.0	110.0	39.8	2.0	0.0	14.6
Chocolate flavored gloss and chapstick	WM014-b02	156.0	1.7	0.0	1.6	0.9	0.0	0.0	0.1
Chocolate flavored gloss and chapstick	WM014-c01	0.2	0.0	0.0	0.9	0.1	0.1	0.0	0.3
4 Lip glosses with zipper pouch	WM053-c01	0.2	0.0	0.0	0.8	0.0	0.0	0.0	0.0

Toys	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Spider Sense Spider Man Foil Puzzle	BL002-b01	0.0	28.1	NA	144.0	5.4	0.0	0.0	6.6
Colored moldable "play" dough	DT006-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Colored moldable "play" dough	DT006-c02	0.3	0.0	0.1	0.0	0.3	0.3	0.0	0.7
Orange stuffed fish	DT041-c01	168.0	0.0	0.0	0.4	0.1	0.2	0.0	0.0
Pink plastic recorder	FM030-c01	0.0	0.0	0.0	0.9	0.1	0.2	0.0	0.0

Toys	Sample	Sb	As	Cd	Cr	Co	Pb	Hg	Mo
Ernie book	TG017-c01	0.0	0.0	0.1	3.3	1.1	3.7	0.0	0.3
Assorted play-doh	TG022-c01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Squishy book	WM008-c01	94.0	0.0	0.0	1.3	3.3	0.4	0.0	0.0
2 Wooden whistles	WM052-c02	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0

Appendix 2: Data from analysis of packaging products for metals

Baby and bath accessories	Sample	Sb	As	Cd	Cr	Co	Cu	Pb	Hg	Mo	Zn
Petroleum Jelly	DT008-b02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.80
Bedtime Baby Cream	DT033-b01	0.0	0.0	1.1	0.0	36.9	0.0	0.0	0.0	2.6	5.60
Diaper sacks	WM023-p01	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	9.00
Soothing Breast Wipes	WM026-p01	38.0	0.0	0.6	7.6	0.0	0.0	30.8	0.0	0.0	37.40
Moist wipes	WM044-p01	95.8	0.0	0.0	0.0	0.0	39.2	0.0	0.0	0.0	8.60
Bubble Bath	WM003-d01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Color Bath Dropz	WM004-b01	0.0	0.0	0.0	0.0	0.0	62.3	0.0	0.0	0.0	3.70

Cosmetics	Sample	Sb	As	Cd	Cr	Co	Cu	Pb	Hg	Mo	Zn
Make up pack	CL007-b04	9.6	35.3	NA	157.0	5.8	266.0	0.0	0.0	13.3	8.5
Make up pack	CL007-b04	3.1	0.0	0.0	10.5	2.5	32.1	10.3	0.0	2.5	153.0
Makeup Box	TG046-p03	0.0	0.0	0.2	37.6	2.5	93.6	42.9	0.0	2.5	314.0

Miscellaneous	Sample	Sb	As	Cd	Cr	Co	Cu	Pb	Hg	Mo	Zn
Orange glow necklace	FM014-p01	119.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	42.6	42.3
Turquoise teenage curtain	SK002-p02	22.2	0.0	NA	5.9	0.0	4,230.0	21.9	0.0	0.0	902,000.0
Khaki curtain	SK003-p02	19.6	0.0	NA	0.0	0.0	3,740.0	113.0	0.0	0.0	884,000.0
Chocolate flavored gloss & chapstick	WM014-b02	156.0	1.7	0.0	1.6	0.9	258.0	0.0	0.0	0.1	85.9
White sleep mask	SK004-p02	0.0	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	40.4
Dog Toys	TG039-p02	1.9	0.0	0.3	36.3	2.5	557.0	738.0	0.0	3.0	309.0

Toys	Sample	Sb	As	Cd	Cr	Co	Cu	Pb	Hg	Mo	Zn
Spider Sense Spider Man Foil Puzzle	BL002-b01	0.0	28.1	NA	144.0	5.4	154.0	0.0	0.0	6.6	0.0
50 Piece princess puzzle in a tin box	DT021-p01	0.0	17.6	NA	269.0	0.0	46.7	0.0	0.0	6.2	0.0
Baseball set, bases	DT036-p01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.5
Nerf ammunition	FM017-p02	12.8	0.0	NA	40.9	2.4	395.0	58.7	0.0	2.0	134.0

Toys	Sample	Sb	As	Cd	Cr	Co	Cu	Pb	Hg	Mo	Zn
Play-doh animal bag	FM028-p04	45.2	0.0	NA	1.0	0.0	11.4	18.9	0.0	0.0	963,000.0
2 Rackets with ball & birdy	SK001-p01	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Princess bouncy ball paddle	SK006-p02	10.7	7.5	NA	0.0	0.0	0.0	0.0	0.0	0.0	383.0
Minnie Mouse Pencil Case	WM046-b02	39.4	0.0	NA	0.0	0.0	14,300.0	46.7	0.0	0.9	959,000.0
Pirate Pencil Case	WM049-b01	0.0	0.0	NA	0.0	0.0	40.4	0.0	0.0	0.0	63.0
Pirate Pencil Case	WM049-b02	31.3	0.0	NA	0.0	0.0	8,180.0	33.7	0.0	0.0	912,000.0

Appendix 3: Data from analysis of metals of concern to Puget Sound

Baby & Bath Accessories	Sample	Copper	Zinc
Soft baby toothbrush teether	AM003-c01	1.3	2.5
Bumpy raspberry teething pacifier	AM004-c01	1.3	3.0
Bumpy raspberry teething pacifier	AM004-c02	1.4	0.0
Baby tooth brush	AM005-c01	0.5	3.8
Tummy play pad	CT001-c02	0.7	6,700.0
3 Pack silicone nipples	DT000-c01	3.3	60.3
Disposable baby bibs	DT005-c01	35.8	107.0
Petroleum Jelly	DT008-b02	0.0	18.8
Bedtime Baby Cream	DT033-b01	0.0	5.6
3 Baby spoons	FM002-c02	7.7	108.0
Baby powder	FM006-c01	0.4	2.3
2 Pacifier set	FM010-c01	0.0	0.0
Mom to mom supreme unscented wipes	SF002-c01	0.0	22.8
Pacifier	SP002-c01	0.0	0.0
2 Pacifier set	TG000-c01	0.0	0.0
2 Fresh food feeders	TG007-c01	556.0	9,640.0
2 Pacifier set	TG010-c01	0.5	0.0
Contact nipple shield	TG013-c01	0.0	0.0
Wide base nipples	TG014-c01	0.0	1.1
2 Pacifier set	TG018-c01	0.0	0.0
HPA lanolin	TG020-c01	0.0	0.0
Body Wash - Vanilla Swirl	TG062-c02	1.0	7.1
Silicone nipples	TR000-c01	0.0	0.0
Sesame Street toothbrush	TR001-c01	6.6	1.7
Sesame Street toothbrush	TR001-c02	85,300.0	51,800.0
Toddler wipes	TR002-c01	1.4	45.5
Pacifier	TR005-c02	0.0	0.0
Pink teething ring	TR009-c01	0.0	3.6
Mesh food sacks	TR011-c01	9.1	13.6
Dr. Suess bib	TR012-c01	0.7	9.6
Travel baby wipes	TR014-c01	1.8	67.6
Pee protector with basketball motif	TR022-c02	0.9	6.7
Baby Wash	WG004-c01	0.5	0.0
Color Bath Dropz	WM004-b01	62.3	3.7
Color Bath Dropz	WM004-c03	0.0	2.2
Small baby bottle	WM005-c01	0.0	0.0
Basketball pacifiers	WM009-c01	0.0	0.0
Soothie pacifier	WM012-c01	0.0	1.1

Pink bib	WM015-c01	0.5	7.2
Clothing	**Sample**	**Copper**	**Zinc**
Girls blue jeans	AM010-c01	2.0	16.2
Girls blue jeans	AM010-c02	150.0	63.2
Boys jeans, button up and sweater	AM011-c01	0.7	4.1
Boys jeans, button up and sweater	AM011-c02	690,000.0	408,000.0
Boys jeans, button up and sweater	AM011-c03	0.3	0.0
Boys jeans, button up and sweater	AM011-c05	0.6	1.5
5 Boys onesies	AM012-c02	0.4	1.9
3 Onesies	AM013-c02	549.0	10.3
Jeans and Jacket	AM014-c02	565,000.0	365,000.0
Jeans and Jacket	AM014-c03	0.7	0.0
Jeans and Jacket	AM014-c04	443,000.0	282,000.0
Jeans and Jacket	AM014-c05	17,500.0	1,080,000.0
Onesie and Overalls	AM015-c02	1.9	10.5
Onesie and Overalls	AM015-c03	586,000.0	340,000.0
Overalls	AM016-c01	6.5	29.7
Overalls	AM016-c02	657,000.0	390,000.0
Girls Blue Jeans size 3	AM017-c01	1.7	4.0
Girls Blue Jeans size 3	AM017-c03	692,000.0	396,000.0
Girls blue jeans	AM018-c01	2.5	11.7
Boys jeans, t-shirt and jacket	AM019-c01	4.7	11.3
Boys jeans, t-shirt and jacket	AM019-c02	44,000.0	8,670.0
Boys jeans, t-shirt and jacket	AM019-c05	2.1	3.0
Boys jeans, t-shirt and jacket	AM019-c06	21,000.0	1,020,000.0
Girls Jeans	AM020-c01	2.7	7.5
Girls Jeans	AM020-c02	700,000.0	394,000.0
Girls Jeans	AM021-c01	2.3	9.9
Girls Jeans	AM021-c02	692,000.0	403,000.0
Girls Jeans	AM021-c03	35,600.0	997,000.0
Space footie pajamas	TG023-c03	10,400.0	1,230,000.0
Sponge Bob briefs	WM033-c03	322.0	21.5
Mickey Mouse undies	WM050-c02	1.0	1,800.0

Cosmetics	**Sample**	**Copper**	**Zinc**
Glitter girl Glitz Nails	BL000-c01	22.6	408.0
Nerds scented nail polish pack	CL003-c01	1.9	4.5
Hello Kitty Nail Polish Pack	CL004-c01	10.2	20.2
Make up pack	CL007-b04a	32.1	8.5
Make up pack	CL007-b04b	266.0	153.0
Lip gloss set	CL009-b02	26.7	203.0

Cosmetics	Sample	Copper	Zinc
Scented neon nail polish set	FM003-c01	36.7	0.0
Face paint crayons	FM004-c01	4.4	3.3
Halloween Makeup variety pack	RA000-c04	4.0	6.1
Halloween Makeup variety pack	RA000-c06	0.0	0.0
Halloween Makeup variety pack	RA000-c13	0.4	4.3
12 Roll-on lip glosses	SK019-c03	366.0	1,090,000.0
Girly temp tattoos	TR006-c01	1.2	13.2
Boy temp tattoos	TR007-c01	1.6	24.5

Footwear	Sample	Copper	Zinc
White Tennis Shoes and bib	JN000-c01	1.8	1.9
White Tennis Shoes and bib	JN000-c02	0.7	30.2
White Tennis Shoes and bib	JN000-c03	1.1	16,000.0
Tennis Shoes	JN001-c01	0.6	229.0
Baby looking-alike shoes	ON002-c02	135.0	331.0
Baby looking-alike shoes	ON002-c03	14.6	9.7
Baby looking-alike shoes	ON002-c04	1.6	71.7
Yellow baby mud boots	ON004-c02	1.4	53.6
Yellow baby mud boots	ON004-c04	4.0	4,090.0
Baby Shoes	SP000-c02	14,000.0	855.0
Baby Sandals	SP001-c01	6.2	77.1
Baby Sandals	SP001-c02	2.2	66.9
Baby Sandals	SP001-c03	12.8	488.0
Baby Sandals	SP001-c04	40.8	5,370.0
Pink baby ballet slippers	WM020-c01	1.0	23.8
Pink baby ballet slippers	WM020-c02	8.0	4,040.0

Halloween Accessories	Sample	Copper	Zinc
Fake gold teeth from quarter machine	SF004-c01	0.0	18.2
White face powder	SH001-c01	0.6	284.0
Face Painting Kit	SH003-c06	4.1	3.6
Face Painting Kit	SH003-c08	0.0	1.8
Face Painting Kit	SH003-c09	0.0	26.3
Face Painting Kit	SH003-c10	1.0	0.0
Family Value Makeup kit	SH004-c01	0.8	2.4
Family Value Makeup kit	SH004-c02	1.7	5.1
Family Value Makeup kit	SH004-c09	0.9	11.0
Family Value Makeup kit	SH004-c10	2.8	5.2
Monster High Makeup kit	SK020-c01	0.5	329.0
Minnie Mouse Pencil Case	WM046-b02	14,300.0	959,000.0

Halloween Accessories	Sample	Copper	Zinc
Pirate Pencil Case	WM049-b01	40.4	63.0
Pirate Pencil Case	WM049-b02	8,180.0	912,000.0
"How to" DVD Makeup Kit	WM056-c08	0.4	1.0
"How to" DVD Makeup Kit	WM056-c09	0.9	5.4
Monster Value Makeup Set	WM058-c01	0.4	0.0
Monster Value Makeup Set	WM058-c04	0.7	69.4
Monster Value Makeup Set	WM058-c11	0.6	3.1
Water based make up	WM062-c03	0.7	9.7

Jewelry	Sample	Copper	Zinc
Hello Kitty Ring	CL000-c01	41,300.0	1,020,000.0
Hello Kitty Ring	CL000-c02	37,100.0	1,030,000.0
Hello Kitty Ring	CL005-c02	144,000.0	438.0
Pink Coin Purse	CL008-c02	9.2	212.0
Changeable Gem pendant	DT003-c05	46.9	193.0
Changeable Gem pendant	DT003-c06	115.0	766.0
Dream Bride Wedding Day variety pack	DT004-c03	1.3	67.9
Maroon Gem earrings	IC000-c01	66,100.0	981,000.0
Plastic earrings - 6 pairs	IC001-c01	47,000.0	1,030.0
Plastic earrings - 9 pairs	IC002-c01	112.0	129.0
Plastic earrings - 9 pairs	IC002-c02	80,900.0	108.0
Butterfly ring	IC003-c02	30,600.0	161.0
Butterfly ring	IC003-c03	66,600.0	1,260,000.0

Lip Balm	Sample	Copper	Zinc
Tangled Flavored Lip Gloss 4 pack	CL001-c03	0.7	3.4
Tangled Flavored Lip Gloss 4 pack	CL001-c09	119.0	10.3
Princess lip balm and keychain in tube	FM007-c02	0.2	0.0
Princess lip balm and keychain in tube	FM007-c04	43,200.0	308.0
Princess keychain and chapsticks	WM010-c04	38,300.0	1,000.0
Chocolate flavored gloss and chapstick	WM014-b02	258.0	85.9
Chocolate flavored gloss and chapstick	WM014-c01	0.7	1.8
4 Lip glosses with zipper pouch	WM053-c01	0.4	0.9

Toys	Sample	Copper	Zinc
Colored moldable "play" dough	DT006-c01	1.6	7.5
Colored moldable "play" dough	DT006-c02	1.4	4.2
Assorted play-doh	TG022-c01	1.0	3.9
Spider Sense Spider Man Foil Puzzle	BL002-b01	154.0	0.0
Orange stuffed fish	DT041-c01	0.9	5.2

Toys	Sample	Copper	Zinc
Pink plastic recorder	FM030-c01	43.2	151.0
Ernie book	TG017-c01	44.7	20.4
Squishy book	WM008-c01	2.8	7.4
2 Wooden whistles	WM052-c02	0.0	13.9