

# Dirty Laundry 2: Hung Out to Dry

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Unravelling the toxic trail  
from pipes to products

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**GREENPEACE**

# Contents

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<b>Executive Summary</b>	<b>5</b>
<b>Section 1 : Methodology and results</b>	<b>11</b>
<b>Section 2: Discussion of results in relation to the stances of major clothing brands</b>	<b>17</b>
<b>Section 3: Conclusions and recommendations</b>	<b>21</b>
Appendix 1	24
Appendix 2	26
Appendix 3	29
References	30

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## Terminology used in this report

**Bioaccumulation:** the mechanism by which chemicals accumulate in living organisms and get passed along the food chain.

**Hormone disruptors:** chemicals known to interfere with hormone systems of organisms. For nonylphenol, the most widely recognised hazard is the ability to mimic natural oestrogen hormones. This can lead to altered sexual development in some organisms, most notably the feminisation of fish.<sup>1</sup>

**Persistence:** the property of a chemical whereby it does not degrade in the environment, or degrades very slowly.

**Plastisol:** a suspension of PVC particles in a plasticiser. Used as ink for screen-printing images and logos onto textiles.

**Surfactants:** chemicals used to lower the surface tension of liquids. They include wetting agents, detergents, emulsifiers, foaming agents and dispersants used in a variety of industrial and consumer applications including textile manufacture.

## Note to the reader

Throughout this report we refer to the terms 'Global North' and 'Global South' to describe two distinct groups of countries. The term 'Global South' is used to describe developing and emerging countries, including those facing the challenges of often rapid industrial development or industrial restructuring, such as Russia. Most of the Global South is located in South and Central America, Asia and Africa. The term 'Global North' is used for developed countries, predominantly located in North America and Europe, with high human development, according to the United Nations Human Development Index.\* Most, but not all, of these countries are located in the northern hemisphere.

\* United Nations Development Programme (UNDP). (2005). Human Development Report 2005. International cooperation at a crossroads. Aid, trade and security in an unequal world. Available at: [http://hdr.undp.org/en/media/HDR05\\_complete.pdf](http://hdr.undp.org/en/media/HDR05_complete.pdf)



# Who will rise to the challenge and champion a toxic-free future?







Abercrombie & Fitch



YOUNGOR

Calvin Klein



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# Executive Summary

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## Detox our clothing, detox our water

Research commissioned by Greenpeace International has revealed that clothing and certain fabric-based shoes sold internationally by major clothing brands are manufactured using nonylphenol ethoxylates (NPEs). NPEs – which are used as surfactants in textile production - subsequently break down to form toxic nonylphenol (NP). Nonylphenol is a persistent chemical with hormone-disrupting properties that builds up in the food chain, and is hazardous even at very low levels.

The investigation involved the analysis of 78 articles of sports and recreational clothing and shoes bearing the logos of 15 leading clothing brands. The 15 brands were: Abercrombie & Fitch, Adidas, Calvin Klein<sup>2</sup>, Converse, GAP, G-Star RAW, H&M, Kappa, Lacoste, Li Ning, Nike, Puma, Ralph Lauren, Uniqlo and Youngor.

Greenpeace purchased the articles tested from companies' flagship stores and from other stores authorised to sell the branded products. The stores were located across 18 countries from both the Global North and Global South, and articles were purchased during April and May 2011.<sup>3</sup> Product labels show that the articles were manufactured in 13 different countries, while three items are of unknown manufacturing origin.<sup>4</sup> The clothing sampled was made from both natural and synthetic fabrics, and included items designed for men, women and children. A variety of items – including shirts, jackets, trousers, underwear and fabric-based shoes – were tested.

Greenpeace submitted all 78 articles of clothing for analysis by a leading independent laboratory, which examined them for the presence of NPEs. Where released untreated, NPEs break down in rivers to form the persistent, toxic and hormone disrupting NP. Even where wastewater treatment facilities are present, they are unable to fully breakdown NPEs, and instead only partially degrade them – often even speeding up their conversion into the toxic NP.

**Detection of NPEs in fabrics is therefore an indicator that NPEs were used during production, resulting in increased levels of nonylphenol reaching the environment; such as in waterways or rivers.**



## Key findings

**Of the 78 articles analysed, 52 (two-thirds) tested positive for the presence of NPEs above the limit of detection of 1 milligram NPEs/kilogram material (mg/kg).** (For more detailed results please refer to the **Results** section on page 11). NPEs were detected in clothing sold by 14 out of the 15 brands tested, in clothing from 17 out of 18 of the countries where the items were purchased, and in 12 out of 13 of the countries where the products tested originated from.

The companies whose products tested positive for NPEs include the major international brands: Abercrombie & Fitch, Adidas, Calvin Klein, Converse, G-Star RAW, H&M, Kappa, Lacoste, Li Ning, Nike, Puma, Ralph Lauren, Uniqlo and Youngor.

## Hung out to dry

**The results of the research clearly demonstrate that NPEs have been used at some stage in the manufacturing processes of clothing bearing the brands of a number of major international clothing companies.** These include items bearing the logos of Adidas and 13 of the other 14 brands examined as part of this investigation.

This analysis also confirms that the use of hazardous chemicals in textile production is not limited to clothing products manufactured in China; it is in fact the case for major-brand articles manufactured in a number of countries. The results demonstrate that this is a global issue tying major clothing brands to toxic pollution released by multiple facilities and suppliers and found in multiple clothing items.

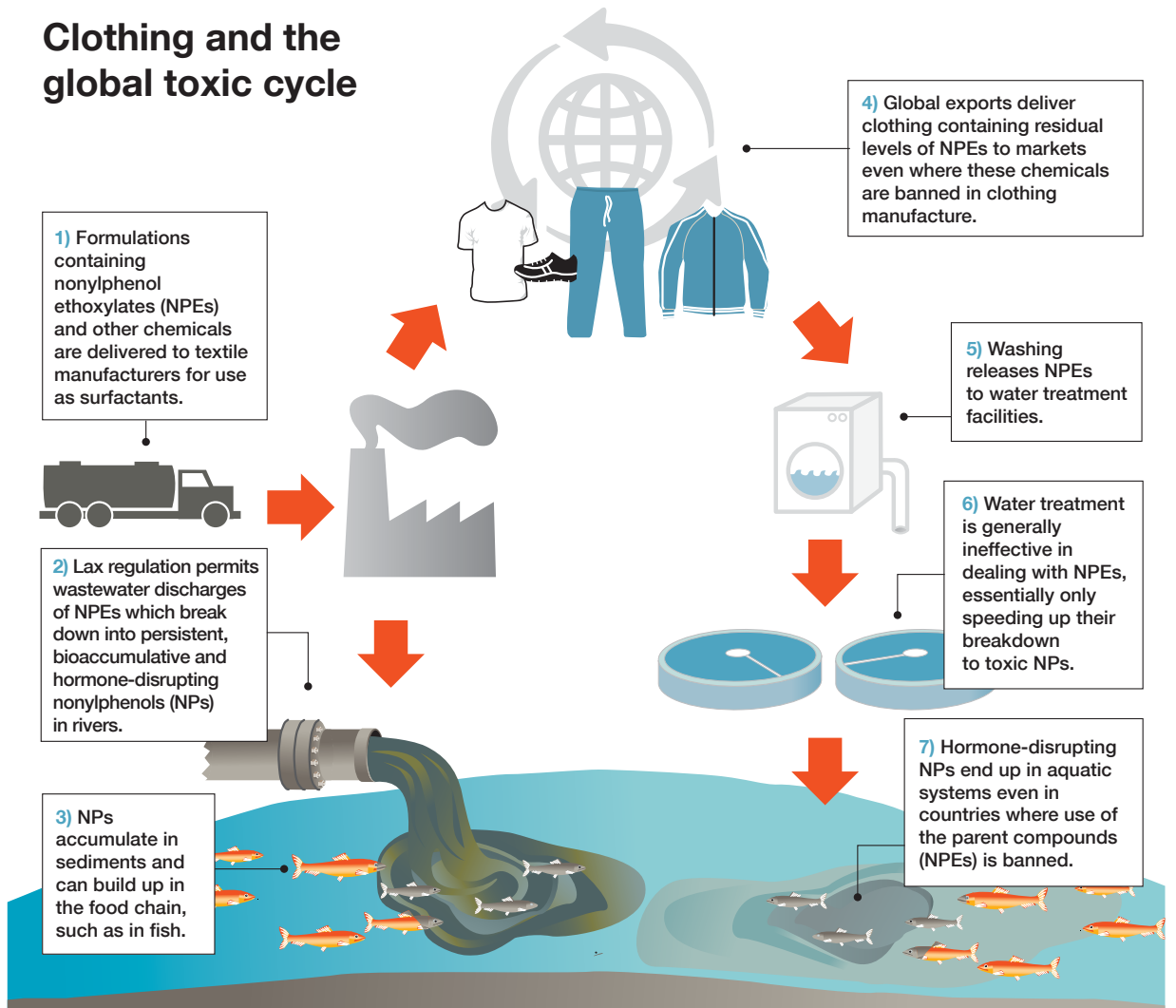
Furthermore, **major clothing brands are making their consumers unwitting contributors to increasing levels of hazardous nonylphenol in the environment and water bodies of countries where the products are purchased**, as the washing of these clothing items can release residual levels of NPEs contained within the apparel into sewage systems. Although the level of NPEs in any given article of clothing is small, the sheer volume of clothing being sold and subsequently washed means that the total quantities being released may be substantial.

The global nature of clothing production and trade also means that articles containing residual levels of NPEs are being imported into countries, such as members of the EU, where the use of these chemicals in clothing manufacture has effectively been banned.<sup>5</sup>

It is also important to note that the non-detection of NPEs does not rule out NPEs being used in the production of a garment, as the finished clothing may have undergone thorough washing prior to retailing. This may have washed out all residues of NPEs from the fabric prior to sale. Such washing would only have further contributed to inputs of NPEs/NP into the environment during the manufacturing stage.

Brand	Number of samples	Number tested positive
	3	3
	9	4
Calvin Klein	4	3
<b>CONVERSE</b>	6	5
	5	3
	2	0
	6	4
	5	4
	4	1
	4	4
	10	5
	9	7
	4	3
	4	3
	3	3
<b>TOTAL</b>	<b>78</b>	<b>52</b>

## Clothing and the global toxic cycle



“The problem and the solution are not only a cause for local concern. This is a truly global issue.”

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## The need for leadership

Irrespective of statements about corporate responsibility, the results presented in this study indicate that major clothing brands do not currently have adequate policies, practices or control over their production processes to prevent their supply chains from using and releasing hazardous chemicals into the environment, nor to prevent them from leaving residues of these chemicals in their products.

**The research highlights that the use of hazardous chemicals by the textile industry is a widespread and pervasive problem which international clothing brands are currently not addressing adequately.**

**As brand owners, they are in the best position to influence the environmental impacts of production by working together with their suppliers to eliminate the releases of all hazardous chemicals from the production process and their products.** These brands need to take responsibility for the use and release of persistent, hormone-disrupting chemicals into our critical and life-sustaining waterways, in both textile-producing countries and in the countries where their products are ultimately sold.

Major brands have a special responsibility to ensure that their overall environmental policies and performance are consistent with the brand values they espouse. This is something they are currently failing to achieve.

**A commitment to zero discharge of hazardous chemicals and greater transparency throughout the supply chain – along with a plan on how to achieve this – is urgently needed in order to prevent the further accumulation of hazardous substances in the aquatic environment, and the resulting build-up in people and wildlife.**

## Signs of progress

The findings from this analysis build on two earlier studies published by Greenpeace. The report *Swimming in Chemicals* found that nonylphenol (as well as PFOS, and other perfluorinated chemicals) were present in fish from the Yangtze River Delta.<sup>6</sup> A more recent study, detailed in the *Dirty Laundry* report, found hazardous chemicals in samples of wastewater discharges from two Chinese textile processing facilities, the Youngor Textile City Complex and the Well Dyeing Factory Limited.<sup>7</sup> These facilities have links to a number of major international and national clothing brands including Adidas, Nike, Puma and the Chinese company Li Ning.

Following the release of *Dirty Laundry* in July 2011, the international sport lifestyle company Puma committed to the elimination of all releases of hazardous chemicals throughout its supply chain by 2020, along with an action plan detailing how it would deliver on this commitment to be made publicly available within the following eight weeks<sup>8</sup>. Nike's subsequent commitment to zero discharge by 2020 not only adds a commitment to action on disclosing its hazardous chemical discharges to the public but also offers to share its tools with the whole apparel sector, seeking to catalyse a sectoral shift, and also supports the goal of systemic societal change.<sup>9</sup>

**Greenpeace is calling on all the other brands to eliminate releases of hazardous chemicals throughout their supply chains and from their products and to convert their words into concrete actions that help bring about a toxic-free world.**



Greenpeace  
International

**Dirty Laundry 2:  
Hung Out to Dry**  
Unravelling the toxic  
trail from pipes to  
products

Executive  
Summary





# 01



# Methodology and results

1

## Scope and extent of the research

The analysis of clothing and certain fabric-based shoes focused on the quantification of NPE concentrations in the products. This does not rule out the possibility that other toxic chemicals were used in the production process, or that traces of other pollutants were present in some of the tested articles.

This research is believed to be the most extensive analysis of its kind to have been conducted to date as far as products sold by major clothing brands are concerned, and certainly with respect to the coverage of countries of manufacture and sale.

## Protocol for purchase, transport and analysis

### Purchase

Greenpeace purchased the articles of clothing that we tested from companies' flagship stores and other stores authorised to sell the branded products, in 18 countries. In order to ensure that the branded products purchased and tested were legitimate branded products, Greenpeace undertook a number of measures:

- All branded products were purchased from retailers who have represented themselves as legitimate distributors of the respective branded products named in this report.
- Greenpeace requested confirmation from each of the respective brands named in this report as to whether the branded product tested was purchased via a legitimate distributor. All stores have been confirmed as legitimate distributors for the branded products that we purchased<sup>10</sup>, with the exception of two stores from Kappa<sup>11</sup> and one from Puma<sup>12</sup>.

While still in the store, purchased articles were immediately sealed in individual clean polyethylene bags.

### Transport

Sealed bags containing the articles were sent to the Greenpeace Research Laboratories, at the University of Exeter in the UK, from where they were dispatched for analysis.

### Analysis

Analysis of clothing was commissioned and organised by the Greenpeace Research Laboratories and was conducted by an independent accredited laboratory.

For the majority of articles, a section of fabric that did not bear any printing was removed and extracted.

From a small number of articles bearing a plastisol print of an image, logo or text on the surface, the section on which this item was printed was removed and extracted.

Samples were extracted with an acetonitrile-water mixture in the ratio 70:30 and then analysed with reversed-phase HPLC liquid chromatography along with Applied Biosystems' API 4000 tandem mass spectrometry (LC-MS/MS).



## Nonylphenol (NP) and Nonylphenol ethoxylates (NPEs)

**Nonylphenol ethoxylates (NPEs):** NPEs are a group of man-made chemicals that do not occur in nature other than as a result of human activity. These compounds belong to a broader group of chemicals known as alkylphenol ethoxylates (APEs), chemicals most widely used as surfactants, including in formulations used by textile manufacturers. Once released to wastewater treatment plants, or directly into the environment, NPEs degrade to nonylphenol.<sup>13</sup> Due to concerns about their hazardous properties, there have been restrictions on the use of NPEs in some regions for almost 20 years.<sup>14</sup>

**Nonylphenol (NP):** NP is manufactured for a variety of specialised industrialised uses, including the manufacture of NPEs. Following use, NPEs can break back down into the NP from which they were produced.<sup>15</sup> **NP is known to be persistent, bioaccumulative and toxic, and is able to act as a hormone disruptor.**<sup>16</sup> **NP is known to accumulate in the tissues of fish and other organisms, and to magnify (be found at ever increasing levels) through the food chain.**<sup>17</sup> **NP has also recently been detected in human tissue.**<sup>18</sup>

In some regions, the manufacture, use and release of NP and NPEs have been regulated for many years. For example, NP and NPEs were included on the first list of chemicals for priority action towards achieving the OSPAR Convention target of ending discharges, emissions and losses of all hazardous substances to the marine environment of the north-east Atlantic by 2020.<sup>19</sup> NP has also been included as a 'priority hazardous substance' under the EU Water Framework Directive.<sup>20</sup> Furthermore, within the EU, since January 2005 products containing greater than 0.1% of NP or NPEs may no longer be placed on the market, with some minor exceptions principally for closed-loop industrial systems.<sup>21</sup> However, the restriction on treated textile products imported from outside the EU has yet to be developed. Elsewhere, NP and NPEs have very recently been included on the list of toxic chemicals severely restricted for import and export in China, which means that their import or export across China's borders now requires prior permission, though their manufacture, use and release are not currently regulated in China.<sup>22</sup>

Products tested, listed by brand

Brand	Number of samples	Number tested positive
	3	3
	9	4
Calvin Klein	4	3
	6	5
	5	3
	2	0
	6	4
	5	4
	4	1
	4	4
	10	5
	9	7
	4	3
	4	3
	3	3
<b>TOTAL</b>	<b>78</b>	<b>52</b>

**Products tested, listed by the countries in which they were purchased**

Country of Purchase	Number of samples	Number tested positive
Argentina	4	4
Austria	4	2
China	10	7
Czech Republic	4	1
Denmark	3	2
Finland	1	1
Germany	7	4
Italy	4	3
Japan	5	3
Netherlands	5	3
Norway	2	2
Philippines	4	2
Russia	4	4
Spain	4	3
Sweden	2	0
Switzerland	6	5
Thailand	4	4
UK	5	2
<b>TOTAL</b>	<b>78</b>	<b>52</b>

## Results and interpretation

Regarding the 78 articles analysed:

- 52 (two-thirds) tested positive for the presence of NPEs above the limit of detection of 1 milligram NPE/kilogram material (mg/kg);
- Levels of NPEs in plain fabric ranged from just above the limit of detection up to 1100 mg/kg. One plastisol printed image sample was found to contain NPEs at 27000 mg/kg.
- Clothing from all brands but one (GAP, two samples) contained NPEs above the detection limit;
- Clothing from 12 of the 13 countries of manufacture contained NPEs above the detection limit (the exception being Tunisia, one sample);
- Clothing purchased in 17 out of the 18 countries contained NPEs above the detection limit (the exception being Sweden, two samples).

A summary of results is presented in the adjacent tables.

### Levels of NPEs

**The presence of NPEs in a product indicates it was used during the manufacture of the product. However, the level of NPEs in the articles is not indicative of the amount of NPEs used during manufacture.** It is possible that NPEs are washed out from materials during manufacture, resulting in a low level of NPEs in the final product. Therefore, a finished article found to contain a low level of NPEs could have been manufactured using far more NPEs than a finished article that was found to contain a higher level.

This study cannot indicate the extent to which NPEs are used in the manufacture of articles for each brand as a whole. Similarly, no estimate can be made of the extent to which NPEs are used in textile manufacture in each producing country as a whole. Nonetheless, **the results clearly indicate that the use of NPEs is widespread throughout the international textile industry and during the production of items for a host of major international clothing brands.**

More detailed results showing the variety of articles analysed are contained in Appendix 1.

## Implications for wearers

The levels of NPEs detected in all articles are not known to constitute any direct health risk to the wearers of the clothing (for more information about NPEs and NP please see page 13).

Some of the branded products analysed for this report.







# 02



## Discussion of results in relation to the stances of major clothing brands

# 2

Many of the major clothing brands whose products were tested in this analysis have public policies restricting the presence of some hazardous substances in their products. Regarding pollution arising from their supply chain, these policies are often limited to only ensuring that suppliers comply with local standards – most of which rarely consider the discharge of the hazardous and persistent chemicals highlighted in this report.

Several brands mentioned in this report regulate the presence of NPEs/NP and other chemicals in their products, though so far, only two have committed to require the elimination of their releases throughout their supply chain and products.<sup>23, 24</sup>

At present, none of the brands have established mechanisms for accountability that would require their suppliers to publicly disclose their use or discharge of hazardous substances. This study provides an opportunity for the brands to be transparent and publicly reveal where the products tested have been manufactured and where NPEs and NP have been used and released in their supply chains. Greenpeace is calling on the brands to work with all their suppliers, to disclose and eliminate all releases of hazardous chemicals.

One example where the need for elimination and substitution of hazardous chemicals has been recognised is by the EU in its chemical management law REACH.<sup>25</sup> This constitutes the best system currently in force to protect the environment and human health against the various adverse effects resulting from the use of hazardous chemicals. Yet it is partly due to the fact that REACH has not been fully implemented, and that it is yet to fully cover imported products, that there are still loopholes that allow NP to be released into environment in the EU, for example via imported items containing residues of NPEs, such as clothing.

Given recognition of the need for cessation of releases of NP in the EU, and the different restrictions a number of countries have imposed on NP and NPEs, it is surprising that none of the brands mentioned in this report require their suppliers to eliminate the use of these chemicals in production. This is despite many of the brands having recognised the hazards of NPEs/NP, and other dangerous chemicals, and placing restrictions on their presence in their products.

**The most effective way to ensure that no hazardous chemicals are present in clothing products, while also ensuring there are no releases during manufacture, is to require the elimination of the use of hazardous chemicals in production.**

It is clear that leading clothing brands have not yet made sufficient efforts to eliminate the use and release of hazardous chemicals during production or to ensure that these chemicals are not present in products sold to the consumer. While some brands are now beginning to engage and show leadership on this issue, most of them still lack even a commitment to zero discharge of hazardous chemicals and the accompanying implementation plan and clear timelines for elimination. Given the urgency of the situation, the risk these hazardous chemicals pose and the responsibility these global brands have towards their customers and the environment – it is clear that this needs to change.





Adidas states:

“ Our strategy is to become a zero-emissions company by:

- Embedding environmental best practice in everything we do
- Maximising environmental efficiency gains
- Supporting and harnessing our people's passion for a greener planet.

Adidas website<sup>26</sup> ”



Abercrombie & Fitch

Abercrombie & Fitch states:

“ Sustainability is a global initiative that we feel strongly about at Abercrombie & Fitch and we stand by our continued commitment to environmental sustainability and compliance efforts.

Abercrombie & Fitch<sup>27</sup> ”



Lacoste states:

“ Lacoste does not have a statement of CSR policy but supports crocodile conservation projects: “Using for over 78 years a crocodile as a logo, the LACOSTE brand actively supports projects selected by the GEF to safeguard or protect certain species of crocodile, alligators, caiman or gavials now in danger of extinction and whose loss would jeopardise the biological balance of their habitat areas.”

Lacoste press kit<sup>28</sup> ”



## Calvin Klein

“ We recognise that our supply chain processes impact the environment. While we do not have direct control over our suppliers, vendors and service providers, we [...] seek to have our suppliers and vendors meet our environmental requirements with respect to wastewater treatment, hazardous chemicals, air quality and recycling. ”

*Phillips-Van Heusen,  
owners of the  
Calvin Klein brand,  
Environmental Statement<sup>29</sup>*



# H&M

H&M states:

“ We apply the precautionary principle in our environment work and have adopted a preventative approach with the substitution of hazardous chemicals. ”

*H&M Conscious  
Actions Sustainability  
Report 2010<sup>30</sup>*

# 03



# Conclusions and recommendations

# 3

## Key conclusions

- **The problem of toxic pollution from textile manufacturing is pervasive and extensive across producer countries. The textile industry is responsible for unknown but potentially significant quantities of hazardous chemicals such as nonylphenol accumulating in the aquatic environment.**
- Irrespective of statements about corporate responsibility, the results presented in this study indicate that **major clothing brands currently do not have adequate policies, practices or control over their supply chains in respect of the use of hazardous chemicals. They must do more to prevent toxic chemicals from reaching the environment in both textile-producing countries and countries where their products are sold.** The problem is by no means limited to major brands but these companies have significant leverage over their suppliers. Major brands also have a special responsibility to ensure that their overall environmental policies and performance are consistent with the brand values they espouse. This is something they are currently failing to achieve.
- Major clothing brands are **making consumers of their clothing unwitting contributors to increasing levels of hazardous nonylphenol in the environments of countries where the products are sold**, including where the parent groups of chemicals (the NPEs) have been banned. This is because washing will release residual levels of NPEs in clothing into sewage systems, and ultimately contribute to increasing levels of NP in the environment. Although the level of NPEs in any given article of clothing is small, the sheer volume of clothing being sold and subsequently washed means that the total quantities being released may be substantial.
- Irrespective of the relatively small number of samples included in the analysis, this research highlights that the use of hazardous chemicals by the textile industry is a widespread and pervasive problem that the international clothing industry is currently not addressing adequately.
- **These findings presented within this study are likely to be just the tip of the iceberg**, with the problems associated with the release of hazardous chemicals not only limited to NPEs and NPs but a great number of hazardous substances currently used by the textile industry.

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## Recommendations

Toxic pollution has to be dealt with in all countries. Hazardous chemicals continue to be used and released, contaminating our waterways and threatening our livelihoods and our future. As influential actors implicated as part of a broken system, brands have a responsibility to act now.

Greenpeace is calling on the brands identified in this report to become **champions for a toxic-free future by eliminating all releases of hazardous chemicals from their supply chains and their products**. Specifically, this entails establishing clear company and supplier policies that commit their entire supply chain to shift from the use of hazardous to safer chemicals, accompanied by a plan of action containing clear and realistic timelines.

Effective policies to eliminate the use and release of all hazardous chemicals across companies' entire supply chains should be based on a **precautionary approach** to chemicals management, and **account for the whole product lifecycle and releases from all pathways**.

To be credible, these policies need to be accompanied by a plan of implementation, containing clear timelines and recognising the need for mechanisms for disclosure and transparent chemicals management, based on the right-to-know principle<sup>31</sup>. Steps, such as knowing which hazardous chemicals their suppliers use and release, being transparent and accountable by making this data publicly available, and prioritising the more hazardous chemicals for immediate elimination are fundamental to demonstrating real and substantial action in the shift towards championing a toxic-free future.

Above all, **these companies need to act as leaders and innovators**. The problems associated with the use and release of hazardous chemicals within the textile industry will not be fixed by severing ties with one or two polluting suppliers, or by eliminating one or two hazardous chemicals. The **solutions are to be found in working together with suppliers to bring about systematic change** in the way brands and businesses create their products. Such action requires vision, commitment and a desire to improve upon the current approach to chemical management. Every brand and supplier has the responsibility to know when and where hazardous chemicals are being used and released up and down their supply chain and to strive to eliminate them.

**It will therefore be through their actions – not their words – that these brands can become genuine champions of a toxic-free future and agents of positive change.**

The time to act is now.

[www.greenpeace.org/detox](http://www.greenpeace.org/detox)






## Appendix 1

78 products tested from 15 brands.

52 items found above detection limit. (NPEs; mg/Kg)

Reference	NPEs (mg/kg)	Sample Code	Country, purchase	City, purchase	Country of manufacture	Kind of product
Abercrombie & Fitch	1100	TX11073	Japan	Tokyo	China	Jeans shorts
Abercrombie & Fitch	39	TX11074	Denmark	Copenhagen	China	T-shirt
Abercrombie & Fitch	18	TX11075	UK	London	Cambodia	T-shirt
Adidas	18	TX11003	Thailand	Bangkok	Thailand	Polo shirt
Adidas	14	TX11005	Norway	Oslo	China	Dress
Adidas	2.0	TX11008	Italy	Rome	Thailand	Football shirt
Adidas	1.1	TX11077	Switzerland	Berne	Philippines	Tracksuit trousers
Adidas	<1	TX11001	China	Beijing	China	T-shirt
Adidas	<1	TX11002	Germany	Hamburg	China	Football shirt
Adidas	<1	TX11004	Netherlands	Amsterdam	Philippines	Tracksuit jacket
Adidas	<1	TX11007	UK	London	China	Sweatshirt
Adidas	<1	TX11009	Austria	Vienna	China	Tracksuit trousers
Calvin Klein	160	TX11049	Switzerland	Berne	Sri Lanka	Pyjama trousers
Calvin Klein	29	TX11050	Argentina	Buenos Aires	Thailand	Underwear
Calvin Klein	9.1	TX11048	Japan	Tokyo	Egypt	Underwear
Calvin Klein	<1	TX11047	China	Beijing	China	Underwear
Converse	27000	TX11032	Philippines	Quezon City	Philippines	T-shirt
Converse	140	TX11031	Germany	Hamburg	Vietnam	Sneakers
Converse	30	TX11036	Spain	Madrid	Vietnam	Sneakers
Converse	17	TX11035	UK	London	China	Sneakers
Converse	1.6	TX11033	Netherlands	Amsterdam	Turkey	T-shirt
Converse	<1	TX11034	Denmark	Copenhagen	Turkey	T-shirt
G-Star RAW	41	TX11064	Spain	Madrid	Bangladesh	T-shirt
G-Star RAW	13	TX11063	Norway	Oslo	Bangladesh	T-shirt
G-Star RAW	11	TX11061	Netherlands	Amsterdam	China	Underwear
G-Star RAW	<1	TX11060	Germany	Hamburg	Bangladesh	T-shirt
G-Star RAW	<1	TX11062	Netherlands	Amsterdam	Tunisia	Jeans
Gap	<1	TX11040	Japan	Tokyo	China	T-shirt
Gap	<1	TX11041	UK	London	Vietnam	T-shirt
H&M	21	TX11070	Netherlands	Amsterdam	Bangladesh	Tank top
H&M	19	TX11069	China	Beijing	China	Polo shirt
H&M	5.0	TX11072	Russia	Moscow	Turkey	T-shirt
H&M	3.1	TX11078	Switzerland	Berne	Bangladesh	Shirt
H&M	<1	TX11042	Austria	Vienna	Bangladesh	T-shirt
H&M	<1	TX11071	Sweden	Stockholm	Bangladesh	Sweatshirt
Kappa	970	TX11054	Austria	Vienna	Bangladesh	T-shirt
Kappa	470	TX11051	Thailand	Bangkok	Thailand	T-shirt
Kappa	240	TX11053	Italy	Anzio (Rome)	Pakistan	Tracksuit
Kappa	24	TX11055	Germany	Hamburg	China	Football shirt

 The articles indicated by this colour bore a plastisol print of an image, logo or text. For these articles, this was this section that was removed and extracted.

Reference	NPEs (mg/kg)	Sample Code	Country, purchase	City, purchase	Country of manufacture	Kind of product
Kappa	<1	TX11052	Czech Republic	Brno	Vietnam	Sweatshirt
Lacoste	3.6	TX11056	Thailand	Bangkok	Thailand	Polo shirt
Lacoste	<1	TX11057	Philippines	Quezon City	unknown	Polo shirt
Lacoste	<1	TX11058	Czech Republic	Praha	unknown	Polo shirt
Lacoste	<1	TX11059	Spain	Madrid	unknown	Polo shirt
Li Ning	680	TX11019	Germany	Frankfurt	China	Sport shirt
Li Ning	9.8	TX11018	China	Hong Kong	China	Polo shirt
Li Ning	7.1	TX11021	Philippines	Quezon City	China	T-shirt
Li Ning	2.8	TX11020	Thailand	Bangkok	Malaysia	Polo shirt
Nike	810	TX11028	Russia	Moscow	China	T-shirt
Nike	660	TX11024	Finland	Helsinki	China	T-shirt
Nike	12	TX11030	Austria	Vienna	Turkey	T-shirt
Nike	2.0	TX11027	Argentina	Buenos Aires	Indonesia	Tracksuit jacket
Nike	1.2	TX11026	Switzerland	Berne	Cambodia	Polo shirt
Nike	<1	TX11022	China	HK	China	T-shirt
Nike	<1	TX11023	Japan	Tokyo	Thailand	Sport shirt
Nike	<1	TX11025	Czech	Praha	Turkey	T-shirt
Nike	<1	TX11029	Italy	Rome	China	T-shirt
Nike	<1	TX11076	Germany	Hamburg	Turkey	Tank top
Puma	210	TX11010	China	Hong Kong	China	T-shirt
Puma	47	TX11014	Switzerland	Berne	Turkey	Football shirt
Puma	14	TX11011	Germany	Hamburg	Vietnam	Sport shorts
Puma	12	TX11016	Spain	Madrid	Malaysia	Tracksuit jacket
Puma	4.4	TX11017	Russia	Moscow	Bangladesh	T-shirt
Puma	1.8	TX11006	Czech	Praha	Turkey	Football shirt
Puma	1.2	TX11015	Argentina	Buenos Aires	China	T-shirt
Puma	<1	TX11012	Philippines	Quezon City	Indonesia	Sport shirt
Puma	<1	TX11013	Sweden	Stockholm	Turkey	T-shirt
Ralph Lauren	220	TX11046	Italy	Anzio (Rome)	Philippines	T-shirt
Ralph Lauren	51	TX11045	Argentina	Buenos Aires	Bangladesh	Jeans
Ralph Lauren	35	TX11043	Denmark	Copenhagen	Indonesia	Polo shirt
Ralph Lauren	<1	TX11044	Switzerland	Berne	China	Polo shirt
Uniqlo	25	TX11068	Russia	Moscow	Bangladesh	Jeans
Uniqlo	8.7	TX11066	Japan	Tokyo	China	Polo shirt
Uniqlo	2.2	TX11065	China	Hong Kong	China	T-shirt
Uniqlo	<1	TX11067	UK	London	Vietnam	Jeans
Youngor	530	TX11039	China	Beijing	China	Polo shirt
Youngor	190	TX11037	China	Beijing	China	Polo shirt
Youngor	19	TX11038	China	Beijing	China	Shirt

## Appendix 2

78 products tested from 15 brands manufactured in 13 countries.  
52 items found above detection limit. (NPEs; mg/Kg)

Country of manufacture	NPEs (mg/kg)	Brand
Bangladesh	41	G-Star RAW
(8 out of 11)	13	G-Star RAW
	<1	G-Star RAW
	21	H&M
	3.1	H&M
	<1	H&M
	<1	H&M
	970	Kappa
	4.4	Puma
	51	Ralph Lauren
	25	Uniqlo
Cambodia	18	Abercrombie & Fitch
(2 out of 2)	1.2	Nike
China	1100	Abercrombie & Fitch
(19 out of 28)	39	Abercrombie & Fitch
	14	Adidas
	<1	Adidas
	<1	Adidas
	<1	Adidas
	<1	Adidas
	<1	Calvin Klein
	17	Converse
	<1	Gap
	11	G-Star RAW
	19	H&M
	24	Kappa
	680	Li Ning
	9.8	Li Ning
	7.1	Li Ning
	810	Nike
	660	Nike
	<1	Nike
	<1	Nike
	210	Puma
	1.2	Puma
	<1	Ralph Lauren
	8.7	Uniqlo
	2.2	Uniqlo
	530	Youngor

Country of manufacture	NPEs (mg/kg)	Brand
	190	Youngor
	19	Youngor
Egypt (1 out of 1)	9.1	Calvin Klein
Indonesia	2.0	Nike
(2 out of 3)	<1	Puma
	35	Ralph Lauren
Malaysia	2.8	Li Ning
(2 out of 2)	12	Puma
Pakistan (1 out of 1)	240	Kappa
Philippines	1.1	Adidas
(3 out of 4)	<1	Adidas
	27000	Converse
	220	Ralph Lauren
Sri Lanka (1 out of 1)	160	Calvin Klein
Thailand	18	Adidas
(5 out of 6)	2.0	Adidas
	29	Calvin Klein
	470	Kappa
	3.6	Lacoste
	<1	Nike
Tunisia (0 out of 1)	<1	G-Star RAW
Turkey	1.6	Converse
(5 out of 9)	<1	Converse
	5.0	H&M
	12	Nike
	<1	Nike
	<1	Nike
	47	Puma
	1.8	Puma
	<1	Puma
Vietnam	140	Converse
(3 out of 6)	30	Converse
	<1	Gap
	<1	Kappa
	14	Puma
	<1	Uniqlo
Unknown	<1	Lacoste
(3 out of 3)	<1	Lacoste
	<1	Lacoste





STAR RAW

CALVIN KLEIN

CALVIN KLEIN



## Appendix 3

78 products tested from 15 brands purchased in 18 countries.  
52 items found above detection limit. (NPEs; mg/Kg)

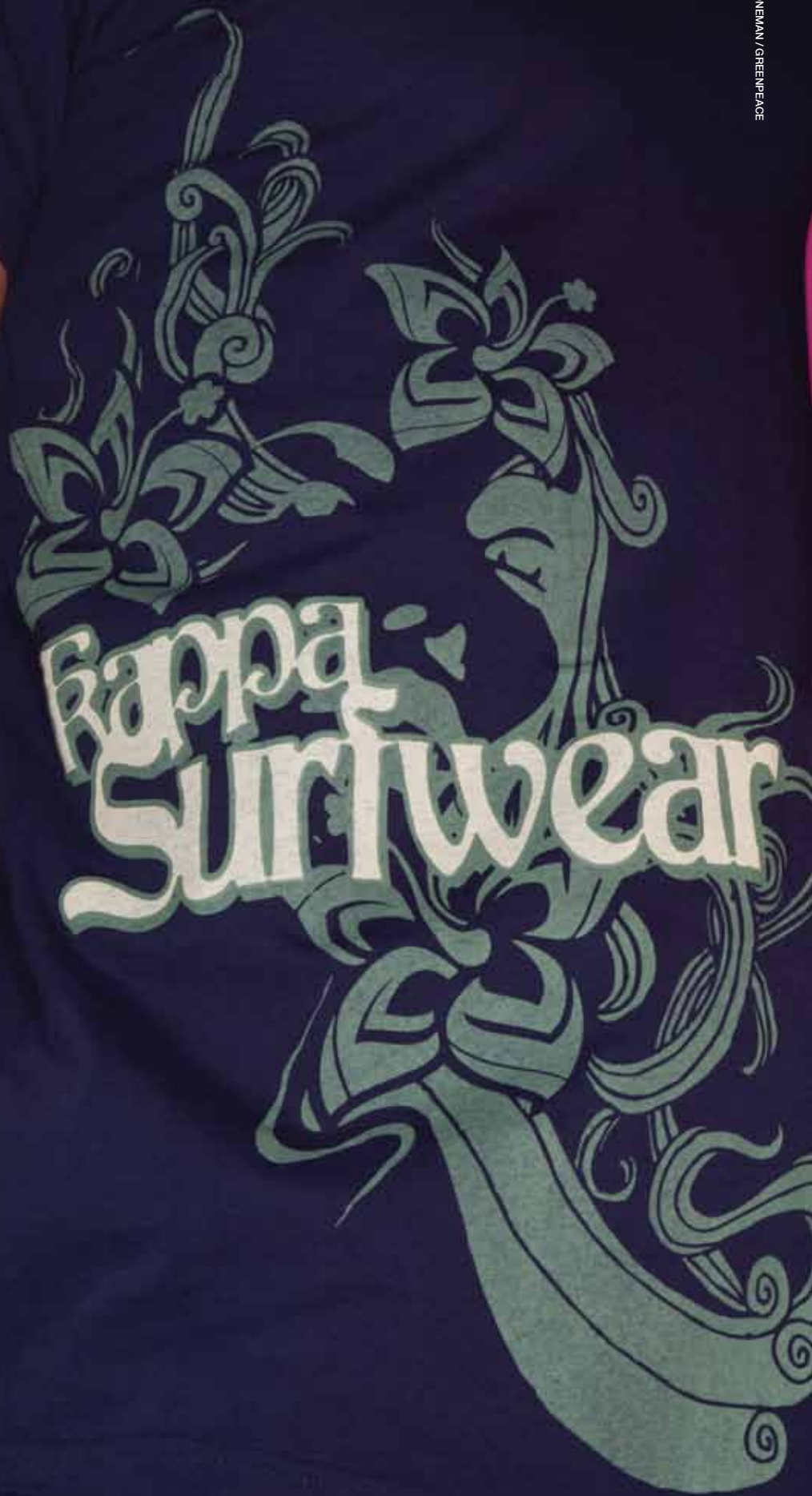
Country of purchase	NPEs (mg/kg)	Brand
Argentina	29	Calvin Klein
(4 out of 4)	2.0	Nike
	1.2	Puma
	51	Ralph Lauren
Austria	<1	Adidas
(2 out of 4)	<1	H&M
	970	Kappa
	12	Nike
China	<1	Adidas
(7 out of 10)	<1	Calvin Klein
	19	H&M
	9.8	Li Ning
	<1	Nike
	210	Puma
	2.2	Uniqlo
	530	Youngor
	190	Youngor
	19	Youngor
Czech Republic	<1	Kappa
(1 out of 4)	<1	Lacoste
	<1	Nike
	1.8	Puma
Denmark	39	Abercrombie & Fitch
(2 out of 3)	<1	Converse
	35	Ralph Lauren
Finland (1 out of 1)	660	Nike
Germany	<1	Adidas
(4 out of 7)	140	Converse
	<1	G-Star RAW
	24	Kappa
	680	Li Ning
	<1	Nike
	14	Puma
Italy	2.0	Adidas
(3 out of 4)	240	Kappa
	<1	Nike
	220	Ralph Lauren
Japan	1100	Abercrombie & Fitch
(3 out of 5)	9.1	Calvin Klein

Country of purchase	NPEs (mg/kg)	Brand
	<1	Gap
	<1	Nike
	8.7	Uniqlo
Netherlands	<1	Adidas
(3 out of 5)	1.6	Converse
	11	G-Star RAW
	<1	G-Star RAW
	21	H&M
Norway	14	Adidas
(2 out of 2)	13	G-Star RAW
Philippines	27000	Converse
(2 out of 4)	<1	Lacoste
	7.1	Li Ning
	<1	Puma
Russia	5.0	H&M
(4 out of 4)	810	Nike
	4.4	Puma
	25	Uniqlo
Spain	30	Converse
(3 out of 4)	41	G-Star RAW
	<1	Lacoste
	12	Puma
Sweden	<1	H&M
(0 out of 2)	<1	Puma
Switzerland	1.1	Adidas
(5 out of 6)	160	Calvin Klein
	3.1	H&M
	1.2	Nike
	47	Puma
	<1	Ralph Lauren
Thailand	18	Adidas
(4 out of 4)	470	Kappa
	3.6	Lacoste
	2.8	Li Ning
UK	18	Abercrombie & Fitch
(2 out of 5)	<1	Adidas
	17	Converse
	<1	Gap
	<1	Uniqlo



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- 1** Jobling S, Reynolds T, White R, Parker MG & Sumpter JP (1995). A variety of environmentally persistent chemicals, including some phthalate plasticisers, are weakly estrogenic. *Environmental Health Perspectives* 103(6): 582-587; Jobling S, Sheahan D, Osborne JA, Matthiessen P & Sumpter JP (1996). Inhibition of testicular growth in rainbow trout (*Oncorhynchus mykiss*) exposed to estrogenic alkylphenolic chemicals. *Environmental Toxicology and Chemistry* 15(2): 194-202
- 2** All communications concerning Calvin Klein products have been conducted with Philips van Heusen Corporation, the owners of the Calvin Klein brand. The four Calvin Klein products tested in this report are licensed by PVH to Warnaco.
- 3** Clothing was purchased in 18 countries: Argentina, Austria, China, the Czech Republic, Denmark, Finland, Germany, Italy, Japan, the Netherlands, Norway, the Philippines, Russia, Spain, Sweden, Switzerland, Thailand and the UK.
- 4** Clothing was manufactured in 13 countries: Bangladesh, Cambodia, China, Egypt, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, Tunisia, Turkey and Vietnam. Three items of were of an unknown country of manufacture.
- 5** EU (2003). Directive 2003/53/EC of the European Parliament and of the Council of 18 June 2003, amending for the 26th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate and cement), now entry number 46 of annex 17 of COMMISSION REGULATION (EC) No 552/2009 of 22 June 2009 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII. *Official Journal L* 164. 26.6.2009: 7-31
- 6** Brigden K, Allsop M & Santillo D (2010). Swimming in chemicals. Greenpeace Research Laboratories, GRL-TN 07/2010 available at <http://www.greenpeace.to/publications/swimming-in-chemicals.pdf>
- 7** Greenpeace International (2011). Dirty Laundry. Unravelling the corporate connections to toxic water pollution in China, available at <http://www.greenpeace.org/dirtylaundryreport>
- 8** Puma's commitment is available at <http://safe.puma.com/us/en/2011/07/puma-is-committed-to-eliminate-discharges-of-hazardous-chemicals-2/>
- 9** Nike's commitment is available at [http://www.nikebiz.com/media/pr/2011/08/17\\_zero\\_discharge.html](http://www.nikebiz.com/media/pr/2011/08/17_zero_discharge.html)
- 10** Youngor did not respond to our letter. Greenpeace however, has substantial information that the store where we bought the products from is an authorised dealer.
- 11** These two stores are in Bangkok and Vienna. They both represented themselves as authorised Kappa retailers. To further ensure we had purchased and tested legitimate Kappa branded products, Greenpeace made repeated communications to Kappa's head office in Turin, Italy. However, over several weeks, Kappa neither confirmed nor denied the authenticity of these stores with regards to the Kappa branded products.
- 12** While a trademark dispute, between Puma AG and the Spanish distributor Estudio 2000, is under litigation, Puma does not recognise the Madrid Studio 2000 store, where we purchased the Puma branded products we tested, as a legitimate distribution outlet for its products. Estudio 2000 claims the products currently sold in this store were manufactured by Puma AG.
- 13** OSPAR (2004). Nonylphenol/nonylphenol ethoxylates. OSPAR Priority Substances Series 2001, updated 2004, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR Commission, London, ISBN 0-946956-79-0: 20 pp. [http://www.ospar.org/documents/dbase/publications/p00136\\_BD%20on%20nonylphenol.pdf](http://www.ospar.org/documents/dbase/publications/p00136_BD%20on%20nonylphenol.pdf)
- 14** PARCOM (1992). PARCOM Recommendation 92/8 on nonylphenol-ethoxylates, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR Commission, London: 1 p. OSPAR (1998). OSPAR Strategy with Regard to Hazardous Substances, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR 98/14/1 Annex 34: EU (2001). Decision No 2455/2001/EC Of The European Parliament And Of The Council Of 20 November 2001 Establishing The List Of Priority Substances In The Field Of Water Policy And Amending Directive 2000/60/EC, *Official Journal L* 249 , 17/09/2002: 27-30
- 15** OSPAR (2004) op cit.
- 16** Jobling et al (1995) op cit; Jobling et al (1996) op cit.
- 17** OSPAR (2004) op cit.
- 18** Lopez-Espinosa MJ, Freire C, Arrebola JP, Navea N, Taoufiki J, Fernandez MF, Ballesteros O, Prada R & Olea N (2009). Nonylphenol and octylphenol in adipose tissue of women in Southern Spain. *Chemosphere* 76(6): 847-852
- 19** OSPAR (1998). OSPAR Strategy with Regard to Hazardous Substances, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR 98/14/1 Annex 34
- 20** EU (2001) op cit.
- 21** EU (2003) op cit.
- 22** MEP (2011). List of Toxic Chemicals Severely Restricted for Import and Export in China (2011). Ministry of Environmental Protection (MEP), The People's Republic of China. [http://www.crc-mep.org.cn/news/NEWS\\_DP.aspx?TitID=267&T0=10000&LanguageType=CH&Sub=125](http://www.crc-mep.org.cn/news/NEWS_DP.aspx?TitID=267&T0=10000&LanguageType=CH&Sub=125)
- 23** Following the release of the first Dirty Laundry report in July 2011, the international sportlifestyle company Puma committed to the elimination of all releases of hazardous chemicals from throughout its supply chain by 2020, along with an action plan detailing how it would deliver on this commitment to be made publicly available within the following 8 weeks. The commitment can be viewed at: <http://safe.puma.com/us/en/2011/07/puma-is-committed-to-eliminate-discharges-of-hazardous-chemicals-2/>
- 24** Nike's subsequent commitment to zero discharge by 2020 not only adds a commitment to action on disclosing its hazardous chemical discharges to the public but also offers to share its tools with the whole apparel sector, seeking to catalyse a sectoral shift, and also supports the goal of systemic societal change. Nike's commitment is available at [http://www.nikebiz.com/media/pr/2011/08/17\\_zero\\_discharge.html](http://www.nikebiz.com/media/pr/2011/08/17_zero_discharge.html)
- 25** Regulation No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- 26** <https://afcares.anfcorp.com/anf/intranet/site/afcares/sustainability>
- 27** Adidas Group (2011) "Green company". [http://www.adidas-group.com/en/sustainability/Environment/green\\_company/default.aspx](http://www.adidas-group.com/en/sustainability/Environment/green_company/default.aspx)
- 28** [http://www.hm.com/filearea/corporate/fileobjects/pdf/en/CSR\\_REPORT2010\\_PDF\\_1302846254219.pdf](http://www.hm.com/filearea/corporate/fileobjects/pdf/en/CSR_REPORT2010_PDF_1302846254219.pdf)
- 29** [http://www.lacoste.com/library/download/pdf/LACOSTE\\_presskit\\_en.pdf](http://www.lacoste.com/library/download/pdf/LACOSTE_presskit_en.pdf)
- 30** [http://www.pvh.com/pdf/environmental\\_policy.pdf](http://www.pvh.com/pdf/environmental_policy.pdf)
- 31** The 'right to know', in the context of workplace and community environmental law, is a term commonly used to refer to the legal principle (or recognition of this principle) whereby the individual has the right to know about the environmental hazards - including chemicals - to which they may be exposed in their daily life. More specifically, community right-to-know aims to allow members of the public greater access to environmental information held by companies or public authorities, thereby increasing the transparency and accountability of both.
- 30 Dirty Laundry 2: Hung Out to Dry** Unravelling the toxic trail from pipes to products





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Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

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