Background information on new literature research of BPA by TEDX

The review of literature research on human health effects of BPA conducted by The Endocrine Disruption Exchange (TEDX)
http://www.endocrinedisruption.org/endocrine.bisphenola.human.php
found **91 epidemiological studies linking BPA to human health effects in humans**; of which 53 published were within the last year.

The review outlines this body of literature, showing clear associations between BPA exposure and adverse prenatal, childhood, and adult health outcomes, including reproductive and developmental effects, metabolic disease, and other health effects. These studies encompass both prenatal and postnatal exposures, and include several study designs and population types.

In respect to the literature review (attached) ChemSec would wish to highlight:
- 22 studies in humans focusing on BPA and children's health outcomes published between 2002 and April 2011;
- 53 epidemiologic cross-sectional, prospective cohort, case report, case-control and randomised clinical trial studies have been examined;
- a further reference to 16 earlier studies is included in this literature review.

The review includes the following amount of recent studies (2010-2012) per category of effects on human health associated with BPA, an indication of share of those studies indicating strong evidence on capacity to interfere with reproduction in humans is provided:

Major Category of Effects	**Number of studies**	**Evidence on capacity to interfere with reproduction in humans**	**No observation of interference with reproduction in humans**
Reproduction			
Fertility	**8**	**7**	**1**[1]
Male Sexual Function	**2**	**2**	**0**
Sperm quality	**4**	**4**	**0**
Sex Hormone concentrations / PCOS	**12**	**12**	**0**
Endometrial Disorders	**3**	**3**	**0**
Breast Cancer	**2**	**1**	**1**[2]
Miscarriage	**2**	**2**	**0**
Premature Delivery	**1**	**1**	**0**
Sub Total	**34**	**32**	**2**
Share % of studies with strong evidence on capacity to interfere with reproduction in humans	**94 %**		

[1] Chen 2013, Urinary BPA was not associated with idiopathic infertility
[2] Aschengrau et al. 1998 BPA was not associated with breast cancer

Development			
Major Category of Effects	**Number of studies**	**Evidence on capacity to interfere with reproduction in humans**	**No observation of interference with reproduction in humans**
Birth weight / fetal Growth	**5**	**4**	**1**[3]
Male Genital Abnormalities	**3**	**2**	**1**[4]
Neurobehavioral Development	**9**	**8**	**1**[5]
Child Wheeze	**1**	**1**	**0**
Child Asthma	**1**	**1**	**0**
Premature Puberty	**3**	**1**[6]	**2**[7]
Sub Total	**22**	**17**	**5**
Share % of studies with strong evidence on capacity to interfere with reproduction in humans	**77%**		

Metabolic diseases			
Major Category of Effects	**Number of studies**	**Evidence on capacity to interfere with reproduction in humans**	**No observation of interference with reproduction in humans**
Type 2 Diabetes	**8**	**5**	**3**[8]
Cardiovascular Disease	**9**	**8**	**1**[9]
Obesity / Growth and Development	**10**	**8**	**2**[10]
Sub Total	**27**	**21**	**6**
Share % of studies with strong evidence on capacity to interfere with reproduction in humans	**78%**		

[3] Padmanabhan et al. 2008 no significant associations between serumBPA at birth and gestation length and birth weight of newborns.

[4] Chevrier et al. 2012 There was no relationship between maternal urinary BPA during pregnancy and hypospadias or cryptorchidism

[5] Yolton et al. 2011 There was no correlation between maternal BPA and infant neurobehavioral abnormalities

[6] Qiao et al. 2010 (Nested case cont) Serum BPA was significantly elevated in girls with precocious puberty compared to controls. Higher BPA was also positively associated with increased uterine and ovarian volume.

[7] 2 studies, same authors Wollff et al. 2008 (Cross-sec) / 2010 (Prosp. Cohort) Urinary BPA was not associated with premature puberty (breast and pubic hair development)

[8] Ning et al. 2011 (Cross-sec) Higher urinary BPA was weakly associated (trend) with increased diabetes as measured by blood glucose; Kim & Park 2012 (Cross-sec.) Higher urinary BPA was weakly associated with increased diagnosis of diabetes. ; LaKind et al 2012

[9] LaKind et al 2012 NHANES: 2003-2010 Urinary BPA was not significantly associated with coronary heart disease, heart attack or type 2 diabetes

[10] Mahalingaiah et al. 2008 (cross sec) Urinary BPA was not associated with BMI, Maserjian et al. 2012 (random clinical trial) No significant difference between treatment groups in BMI, body fat, or growth rate

Other effects			
Major Category of Effects	**Number of studies**	**Evidence on capacity to interfere in humans**	**No observation of interference in humans**
Thyroid function, Immune Function, Albuminuria, Oxidative stress and inflammation	**11**	**10**	**1**[11]
Epigenetics	**1**	**1**[12]	**0**
Gene Expression	**1**	**1**[13]	**0**
Sister Chromatid Exchange	**1**	**0**	**1**[14]
Sub Total	**14**	**12**	**2**
Share % of studies with strong evidence on capacity to interfere with reproduction in humans	**86%**		

[11] Brucker-Davis et al. 2011 (Newborn boys born with or without cryptorchidism) Weak trend for a negative correlation between BPA and TSH. There was no association between BPA and cryptorchidism

[12] Hanna et al 2012 (Cross sec.) Higher serum BPA was significantly associated with less methylation at the TSP50 gene promoter

[13] Melzer et al. 2011 (cross-sec) Higher urinary BPA is associated with higher expression of 2 estrogen-responsive genes : ESR2 (ERbeta) and ESRRA (ERRalpha) in peripheral blood leukocytes

[14] Yang et al. 2006 (Cross Sec.) Higher urinary BPA had a weak positive correlation with SCE in lymphocytes