

List of PFAS Concerns from January 10, 2018 SAB meeting

This draft document lists concerns documented on the whiteboard at the January 10, 2018 SAB meeting; references have been added from meeting notes and materials, and have been distributed for Board review. This draft includes updates from Board members as of 2/8/18. The Board notes that the weight of evidence varies among endpoints.

PFBA

Persistence (reviewed in Danish EPA 2015b)

Very mobile (potential global transport) (*Cai 2012, NICNAS 2016a*)

Thyroid effects (*Bjork and Wallace 2009, MN DPH 2011a*)

Liver effects (*Foreman 2009, Bjork and Wallace 2009, MN DPH 2011a, Wolf 2008, Rosenmai 2016*)

Endocrine effects (*Foreman 2009*)

Hematological effects (*MN 2011a, Butenhoff 2012a, van Otterdijk 2007b*)

Developmental effects (*Das 2008*)

Corrosivity (HAZMAP)

Phytoaccumulation (*Blaine 2014*)

Presence in serum (*Nilsson 2013*), breastmilk (*Lorenzo 2016*). Toxicokinetics: human half-life 72-87 hrs (*Chang 2008*)

Presence in the environment (*Su 2016, ATSDR 2008*)/ongoing exposure

PFBS

Asthma (*Dong 2013*)

Immunotoxicity (*Corsini 2012*)

Persistence (reviewed in Danish EPA 2015b)

Very mobile (potential global transport)(*Zhao 2012*) (reviewed in Danish EPA 2015b)

Thyroid effects (*Feng 2017*)

Metabolic effects

Endocrine effects (*Gorrochategui 2014*)

Hematological effects (*Lieder 2009b, MN DPH 2011*)

Developmental effects (*Feng 2017, Lieder 2009a, Lieder 2009b*)

Corrosivity (HSDB 2017b)

Bioaccumulation - marine (*Chu 2016, precursor FBSA in fish*), earthworm (*Zhao 2013*)

Presence in the environment (*Chu 2016*), human serum (*Glynn 2012, Glynn 2012a, Gyllenhammar 2015*), ongoing exposure

Neurotoxicity (*Slotkin 2008*)

Kidney effects (*Lieder 2009a, Lieder 2009b, MN DPH 2011*)

PFHxA

Persistence (*reviewed in Danish EPA 2015 and ENVRION 2014*)

Very mobile (*potential global transport*) (*reviewed in Danish EPA 2015*)

Thyroid effects (*Ren 2016*)

Liver effects (high dose) (*Loveless 2009*)

Endocrine effects (*PPAR α Wolf 2008, Rosenmai 2016*)

Developmental effects (*ToxServices 2016 - Greenscreen: moderate [Loveless 2009], Iwai 2014*)

Corrosivity (ECHA)

Presence in serum (*Russell 2013, Guo 2011*), breastmilk (*Kang 2016*). Toxicokinetics: exposed workers serum half-life 14-49 days (*Russell 2013*)

Presence in the environment (*Campo 2016, Gyllenhammar 2015, MI DCH 2015*)/ongoing exposure

Neurotoxicity (*Loveless 2009, Klaunig 2015*)

Kidney effects (*NICNAS 2017*)

Bioaccumulation: earthworm (*Zhao 2013*)

Eco toxicity: Bluegreen algae (*HSDB/Latala 2009*), zebrafish embryo amplified PFOS/PCB mixture toxicity (*Blanc 2017*)

PFHxS

Persistence (*reviewed in ECHA 2017*)

Thyroid effects (*Jain 2013, Weiss 2009*)

Liver/metabolic effects (*Butenhoff 2009*)

Endocrine effects (*PPAR α : Das 2017, Rosenmai 2017*)

Hematological effects

Neurodevelopmental effects (*Maisonet 2012, Joensen 2009, Viberg 2013, Lee and Viberg 2013, Lee and Yang 2016*)

Corrosivity (ECHA)

Bioaccumulation (*Haukas 2007, Houde 2006, Butt 2008, reviewed in ECHA 2017*) earthworm (*Rich 2014*)

Presence in serum (*Olsen 2007, Gyllenhammar 2015, Bartolome 2017*), breastmilk (*Tao 2008, Karrman 2010, Sundstrom 2011*). Toxicokinetics: long half-life (7-8 yrs) in human serum (*Olsen 2007*)

Widespread presence in the environment, including remote regions/ongoing exposure (*Zhou 2014, Houde 2006, Butt 2008, Campo 2016, Kelly 2009a, reviewed in ECHA 2017*)

Neurotoxicity (*Zhang 2016, Lee and Yang 2014, Viberg 2013*)

Asthma (*Dong 2013*)

DRAFT