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NC DEQ and the EPA PFAS Values

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PFAS in North Carolina

PFBS	PFHxS	PFHpA	PFMOAA	PMPA	PFOS
PFOA	PFO2HxA	PFBA	PEPA	PFO3OA	PFHxA
PFNA	GenX	PFO4DA	PFO5DA	HydroEVE	PFDA
		PFPeA	Nafion BPs		

PFAS in North Carolina

EPA PFAS RoadMap Compounds

- PFBS
- PFHxS
- PFOS
- PFOA
- PFBA
- PFHxA
- PFNA
- GenX
- PFDA

Non-EPA PFAS RoadMap Compounds

- PFHpA
- PFMOAA
- PMPA
- PFO2HxA
- PEPA
- PFO3OA
- PFO4DA
- PFO5DA
- HydroEVE
- PFPeA
- Nafion BPs

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PFAS in North Carolina

PFBS

PFOS

PFOA

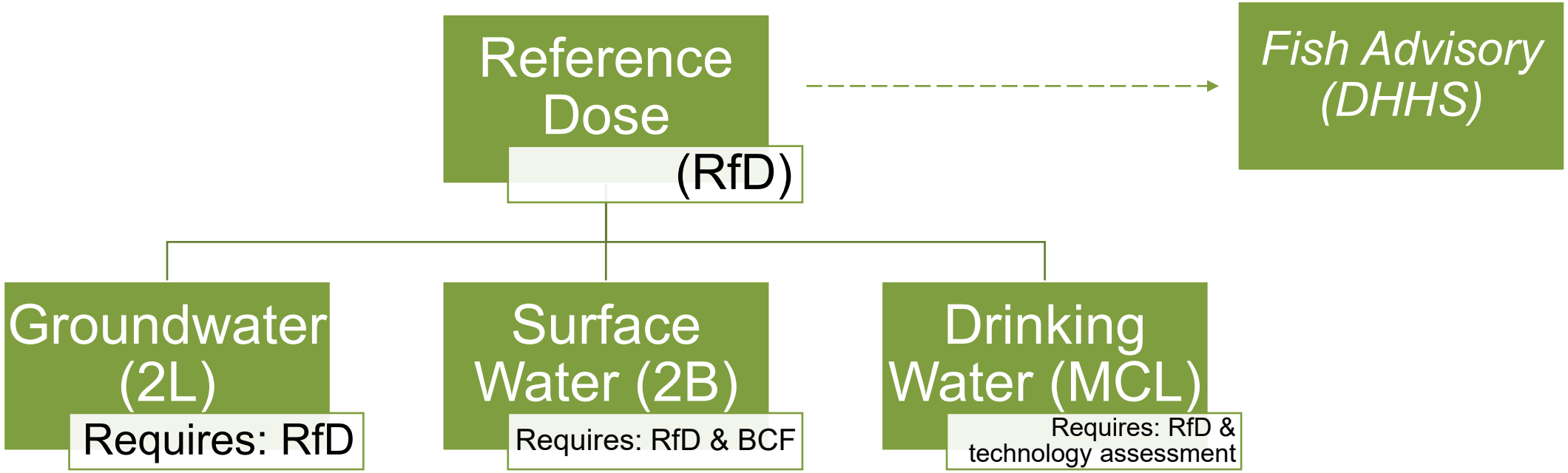
GenX

PFAS with EPA Reference Dose (RfD)

EPA PFAS Values

PFAS	EPA Reference Dose (mg/kg/day)	EPA Lifetime Drinking Water Health Advisory (ppt)
GenX	0.000003	10
PFBS	0.0003	2000
PFOS	0.000000008	0.02 (interim)
PFOA	0.0000000015	0.004 (interim)

The Important of Reference Doses in NC Standard Development



Developing Potential Regulatory Targets

PFAS	EPA Drinking Water Health Advisory	NC Groundwater Calculation (2L) *Requires: RfD*	NC Surface Water Calculation (2B) *Requires: RfD* & BCF	NC Drinking Water Calculation (MCL) *Requires: RfD* & tech/fiscal note
GenX	10 ppt	*Can be calculated using existing rule*	*Need BCF info*	*Need fiscal and technological assessment*
PFBS	2000 ppt			
PFOS	0.02 ppt			
PFOA	0.004 ppt			

Bio-concentration and Bio-accumulation Factors

BCF/BAF - an indicator of a chemical substance's tendency to accumulate in the living organism.

- Each of these can be calculated using either empirical data or measurements as well as from mathematical models.
- BCF can also be expressed as the ratio of the concentration of a chemical in an organism to the concentration of the chemical in the surrounding environment.
  - The BCF is a measure of the extent of chemical sharing between an organism and the surrounding environment.
  - A BCF greater than 1 is indicative of accumulation.

Bio-concentration and Bio-accumulation Factors

BCF/BAFs require either environmental measurements or modeling data.

- EPA has assessed PFOS and PFOA BCF data for the draft Aquatic Life Criteria.
  - The SSAB can help assess this data to determine if any of the included values are appropriate for North Carolina (*i.e., species, environmental parameters*)

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EPA's Aquatic Life BAF Values

Organized by:

- Tissue
- Species
- Location

Provides:

- BAF and logBAF
- Data Quality Ranking
- Reference Info

Common Name	Scientific Name	Tissue	Log BAF (L/kg-ww)	BAF (L/kg-ww)	Ranking	Location	Reference
Lefteye flounder	*Paralichthys olivaceus*	Liver	4.379	23958	medium	Ariake Bay	Taniyasu et al. (2003)
sea mullet	*Mugil cephalus*	Liver	3.699	5000	medium	Sydney Harbour, Australia	Thompson et al. (2011)
European perch	*Perca fluviatilis*	Muscle	3.531	3400	high	Lake Halmsjön, near Stockholm, Sweden	Ahrens et al. (2015)
minnow	*Hemiculter leucisculus*	Muscle	3.785	6092	high	Taihu Lake, China	Fang et al. (2014)
silver carp	*Hypophthalmichthys molitrix*	Muscle	3.246	1761	high	Taihu Lake, China	Fang et al. (2014)
white bait	*Reganisalanx brachyrostralis*	Muscle	3.452	2835	high	Taihu Lake, China	Fang et al. (2014)
Japanese crucian carp	*Carassius cuvieri*	Muscle	4.193	15599	high	Taihu Lake, China	Fang et al. (2014)
Lake Saury	*Coilia mystus*	Muscle	3.963	9190	high	Taihu Lake, China	Fang et al. (2014)
common carp	*Cyprinus carpio*	Muscle	3.882	7623	high	Taihu Lake, China	Fang et al. (2014)
Mongolian culter	*Culter mongolicus*	Muscle	4.179	15088	high	Taihu Lake, China	Fang et al. (2014)
mudfish	*Misgurnus anguillicaudatus*	Muscle	4.034	10810	high	Taihu Lake, China	Fang et al. (2014)
Chinese bitterling	*Rhodeus sinensis Gunther*	Muscle	3.809	6444	high	Taihu Lake, China	Fang et al. (2014)
Goby	*Ctenogobius giurinus*	Muscle	3.788	6144	high	Taihu Lake, China	Fang et al. (2014)
eel	*Anguilla anguilla*	Muscle	3.510	3236	high	Netherlands	Kwadijk et al. (2010)
European chub	*Leuciscus cephalus*	Muscle	3.400	2512	high	Orge River, near Paris, France	Labadie and Chevreuil (2011)
Juvenile char	*Salvelinus alpinus*	Muscle	3.274	1878	high	Meretta Lake, Canadian High Arctic	Lescord et al. (2015)
Juvenile char	*Salvelinus alpinus*	Muscle	3.016	1038	high	Resolute Lake, Canadian High Arctic	Lescord et al. (2015)
Juvenile char	*Salvelinus alpinus*	Muscle	4.033	10800	high	Char Lake, Canadian High Arctic	Lescord et al. (2015)
Adult char	*Salvelinus alpinus*	Muscle	2.767	585.4	high	Meretta Lake, Canadian High Arctic	Lescord et al. (2015)

Proposed Next Steps

Evaluate the EPA's Aquatic Life Criteria BAF values and data

1. DEQ will sort through the data to determine which species and locations are appropriate for consideration in North Carolina.
2. DEQ will compare the environmental parameters of the smaller list of locations to determine which values in the short list are applicable (*i.e., salinity, temperature, dissolved oxygen, trophic web dynamics, etc.).*
3. DEQ will synthesize the information and present the finding to the SSAB.
4. The SSAB will recommend a value or a range of values that can be used by DEQ to propose SW standards and conduct a fiscal assessment in rulemaking proceedings.

Progress will be presented at the Oct 2022 SSAB Meeting

Thank you

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