Standards Preparation

Integrated Atmospheric Deposition Network

O'Neill School of Public and Environmental Affairs

Indiana University

Bloomington, IN 47405

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For each compounds suite, there are seven types of standards that are used. A brief description of each one is provided below:

1. Stock solutions: used to prepare most of the working standards
2. Calibration standards: used for instrument calibration
3. Common reference standards (CRS): used for checking the instrument's calibration
4. Internal standards (IS): used for quantitation of target compounds
5. Surrogate standards (SS): used for evaluating recovery efficiency of each sample.
6. Matrix spike (MS) recovery standard: used for evaluating overall lab processing efficiency of target compounds
7. Linearity standards: used for determining instrument performance over a range of concentrations.
8. Instrument detection limit (IDL) standards: used for determining the detection limit of the instrument.

PCB STANDARDS

Table 1. Table of PCB custom and individual stock standards and their concentrations

Standard	Vendor	Mixture Type	Purpose	Concentration (µg/mL)
S-8074-AR1	AccuStandard	Mixture	PCB Calibration Std	1.0 ; 0.5
S-8074-BR1	AccuStandard	Mixture	PCB Calibration Std	1.0 ; 0.5
S-8074-CR1	AccuStandard	Mixture	PCB Calibration Std	1.0 ; 0.5
C-IADN-01	AccuStandard	Mixture	Common Reference Std	30.0
C-IADN-02	AccuStandard	Mixture	Common Reference Std	30.0
C-IADN-03	AccuStandard	Mixture	Common Reference Std	30.0
S-75951	Agilent	Mixture	PCB Linearity	547.216
S-97607	Agilent	Mixture	PCB MS Vials	1.0 ; 1.5
CUS 937	Ultra	Mixture	PCB IDL	52.79
rpc-017s; PCB 14	Agilent	Individual Cong.	PCB Surrogate Std	100.0
rpc-028s; PCB 65	Agilent	Individual Cong.	PCB Surrogate Std	100.0
rpc-115s; PCB 166	Agilent	Individual Cong.	PCB Surrogate Std	100.0
rpc-020s; PCB 30	Agilent	Individual Cong.	PCB Internal Std	100.0
rpc-078s; PCB 204	Agilent	Individual Cong.	PCB Internal Std	100.0
rpc-010s; PCB 11	Agilent	Individual Cong.	PCB MS Vials	100.0
rpc-090s; PCB 169	Agilent	Individual Cong.	PCB MS Vials	100.0
rpc-102s; PCB 126	Agilent	Individual Cong.	PCB MS Vials	100.0

Table 2. Table of individual PCB congeners and their concentrations in custom stock mixtures S-8074-AR1, S-8074-BR1, and S-8074-CR1.

S-8074-AR1 PCB	S-8074-ARI µg/mL	S-8074-BRI PCB	S-8074-BRI µg/mL	S-8074-CRI PCB	S-8074-CRI µg/mL
4	1.0	5	1.0	6	1.0
7	1.0	8	1.0	9	1.0
10	1.0	12	1.0	13	1.0
15	1.0	16	0.5	17	0.5
18	0.5	19	0.5	22	0.5
28	0.5	26	0.5	31	0.5
32	0.5	33	0.5	37	0.5
41	0.5	42	0.5	44	0.5
45	0.5	47	0.5	48	0.5
52	0.5	49	0.5	53	0.5
56	0.5	60	0.5	64	0.5
66	0.5	70	0.5	71	0.5
74	0.5	76	0.5	77	0.5
81	0.5	83	0.5	84	0.5
85	0.5	87	0.5	89	0.5
91	0.5	92	0.5	95	0.5
97	0.5	99	0.5	100	0.5
101	0.5	105	0.5	110	0.5
114	0.5	118	0.5	119	0.5
123	0.5	126	0.5	128	0.5
131	0.5	132	0.5	135	0.5
138	0.5	144	0.5	149	0.5
153	0.5	156	0.5	163	0.5
167	0.5	169	0.5	170	0.5
171	0.5	172	0.5	174	0.5
180	0.5	190	0.5	194	0.5
200	0.5	199	0.5	202	0.5
205	0.5	206	0.5	207	0.5

Table 3. Table of individual PCB congeners in custom stock mixtures C-IADN-01, C-IADN-02, and C-IADN-03 and their associated concentrations (µg/mL).

C-IADN-01	C-IADN-02	C-IADN-03	Conc., µg/mL
4	5	6	30.0
7	8	9	30.0
10	12	13	30.0
15	16	17	30.0
18	19	22	30.0
28	26	31	30.0
32	33	37	30.0
41	42	44	30.0
45	47	48	30.0
52	49	53	30.0
56	60	64	30.0
66	70	71	30.0
74	76	77	30.0
81	83	84	30.0
85	87	89	30.0
91	92	95	30.0
97	99	100	30.0
101	105	110	30.0
114	118	119	30.0
123	126	128	30.0
131	132	135	30.0
138	144	149	30.0
153	156	163	30.0
167	169	170	30.0
171	172	174	30.0
180	190	194	30.0
200	199	202	30.0
205	206	207	30.0

Table 4. Table of individual PCB congeners and their concentrations in the custom stock mixture S-75951 (total concentration of 547.216 µg/mL).

Congener	Conc. µg/mL	Congener	Conc. µg/mL	Congener	Conc. µg/mL
4+10	13.696	37	4.843	123+149	11.239
7+9	4.805	42	5.600	118	4.814
6	7.615	41+71	9.292	114	0.522
5+8	56.14	64	7.200	131	0.120
19	1.120	100	0.445	105+132+153	17.306
11	20.200	74	7.646	163+138	10.865
12	6.814	70+76	13.674	126	4.016
13	0.392	66	21.010	128	0.402
18	14.900	95	8.032	167	0.199
17+15	14.948	91	2.040	174	12.810
16	8.016	56+60	14.063	202+171	3.176
32	7.615	84+92	7.236	156	0.264
26	2.817	89	0.410	172	2.242
31	18.820	101	7.222	180	24.400
28	18.820	99	2.966	199	1.725
33	13.210	119	0.110	169	4.024
53	2.600	83	0.602	170+190	6.810
22	11.600	97	2.260	201	16.830
45	3.600	81	0.642	207	0.374
52	18.110	87	4.000	194	7.214
49	9.292	85	2.806	205	0.441
47	4.004	77	0.935	206	2.747
48	4.024	110	7.638		
44	17.290	135+144	3.564		

Table 5. Table of individual PCB congeners and their concentrations in the custom stock mixture S-97607 (total concentration of 90.5 µg/mL).

PCB	Conc. µg/mL	PCB	Conc. µg/mL	PCB	Conc. µg/mL
4	1.5	49	1.0	118	1.0
5	1.5	52	1.0	119	1.0
6	1.5	53	1.0	123	1.0
7	1.5	56	1.0	126	1.0
8	1.5	60	1.0	128	1.0
9	1.5	64	1.0	131	1.0
10	1.5	66	1.0	132	1.0
11	1.5	70	1.0	135	1.0
12	1.5	71	1.0	138	1.0
13	1.5	74	1.0	144	1.0
15	1.5	76	1.0	149	1.0
16	1.0	77	1.0	153	1.0
17	1.0	81	1.0	156	1.0
18	1.0	83	1.0	163	1.0
19	1.0	84	1.0	167	1.0
22	1.0	85	1.0	169	1.0
26	1.0	87	1.0	170	1.0
28	1.0	89	1.0	171	1.0
31	1.0	91	1.0	172	1.0
32	1.0	92	1.0	174	1.0
33	1.0	95	1.0	180	1.0
37	1.0	97	1.0	190	1.0
41	1.0	99	1.0	194	1.0
42	1.0	100	1.0	199	1.0
44	1.0	101	1.0	201	1.0
45	1.0	105	1.0	202	1.0
47	1.0	110	1.0	205	1.0
48	1.0	114	1.0	206	1.0
				207	1.0

Individual PCB Stock Solutions

Instructions: Dilute 1 mL of a selected individual PCB standard to 50 mL in hexane as shown for PCB congeners 11, 14, 65, 126, 155, and 169 as shown in Table 6. Dilute 1 mL of a selected individual PCB standard to 100 mL in hexane as shown for PCB congeners 30, 166, and 204 as shown in Table 6. Each solution is prepared separately.

Table 6. Table of individual PCB stock solutions.

Stock	Conc. µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PCB 11	100.0	1.0	50.0	2,000
PCB 14	100.0	1.0	50.0	2,000
PCB 30	100.0	1.0	100.0	1,000
PCB 65	100.0	1.0	50.0	2,000
PCB 126	100.0	1.0	50.0	2,000
PCB 155	100.0	1.0	50.0	2,000
PCB 166	100.0	1.0	100.0	1,000
PCB 169	100.0	1.0	50.0	2,000
PCB 204	100.0	1.0	100.0	1,000

PCB Internal Standard (IS)

Instructions: Mix aliquot volumes of stock PCB-30 and -204 standards (Table 6) together as shown in Table 12 and dilute to 100 mL in hexane.

Table 7. Table of working PCB internal standard.

Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
PCB-30	1,000	8.0	100	80
PCB-204	1,000	6.0	100	60

PCB / Pesticide Surrogate Recovery Standard (SS)

Instructions: Mix aliquot volumes individual PCB and Pesticide stock standards (Tables 6 and 25) together as shown in Table 8 and dilute to 100 mL in hexane. Information on preparation of pesticide stock solutions can be found in the Pesticide section (Table 25).

Table 8. Table of PCB / Pesticide surrogate recovery standard working mixture.

Stock	Stock Conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
PCB-14	2,000	10.0	100	200
PCB-65	2,000	2.5	100	50
PCB-166	1,000	5.0	100	50
DBC	2,000	10.0	100	200
δ-HCH	2,000	10.0	100	200
ε-HCH	1,000	10 .0	100	200

PCB Common Calibration Standard

Instructions: Mix indicated aliquot volumes of selected PCB and Pesticide standards together and dilute to 100 mL in hexane as shown in Table 9. For preparation of individual pesticide stock solutions, see Table 25.

Table 9. Table of PCB Common Calibration Standard.

Stock	PCB / Pesticide	Stock Conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
S-8074-AR1			*1.0*	*100*	
	4	1.0	1.0	100	10.0
	7	1.0	1.0	100	10.0
	10	1.0	1.0	100	10.0
	15	1.0	1.0	100	10.0
	18	0.5	1.0	100	5.0
	28	0.5	1.0	100	5.0
	32	0.5	1.0	100	5.0
	41	0.5	1.0	100	5.0
	45	0.5	1.0	100	5.0
	52	0.5	1.0	100	5.0
	56	0.5	1.0	100	5.0
	66	0.5	1.0	100	5.0
	74	0.5	1.0	100	5.0
	81	0.5	1.0	100	5.0
	85	0.5	1.0	100	5.0
	91	0.5	1.0	100	5.0
	97	0.5	1.0	100	5.0
	101	0.5	1.0	100	5.0
	114	0.5	1.0	100	5.0
	123	0.5	1.0	100	5.0
	131	0.5	1.0	100	5.0
	138	0.5	1.0	100	5.0
	153	0.5	1.0	100	5.0
	167	0.5	1.0	100	5.0
	171	0.5	1.0	100	5.0
	180	0.5	1.0	100	5.0
	200	0.5	1.0	100	5.0
	205	0.5	1.0	100	5.0
S-8074-BR1			*1.0*	*100*	
	5	1.0	1.0	100	10.0
	8	1.0	1.0	100	10.0
	12	1.0	1.0	100	10.0
	16	0.5	1.0	100	5.0
	19	0.5	1.0	100	5.0
	26	0.5	1.0	100	5.0
	33	0.5	1.0	100	5.0
	42	0.5	1.0	100	5.0
	47	0.5	1.0	100	5.0
	49	0.5	1.0	100	5.0
	60	0.5	1.0	100	5.0
	70	0.5	1.0	100	5.0
	76	0.5	1.0	100	5.0

	83	0.5	1.0	100	5.0
	87	0.5	1.0	100	5.0
	92	0.5	1.0	100	5.0
	99	0.5	1.0	100	5.0
	105	0.5	1.0	100	5.0
	118	0.5	1.0	100	5.0
	126	0.5	1.0	100	5.0
	132	0.5	1.0	100	5.0
	144	0.5	1.0	100	5.0
	156	0.5	1.0	100	5.0
	169	0.5	1.0	100	5.0
	172	0.5	1.0	100	5.0
	190	0.5	1.0	100	5.0
	199	0.5	1.0	100	5.0
	206	0.5	1.0	100	5.0
S-8074-CR1			***1.0***	***100***	
	6	1.0	1.0	100	10.0
	9	1.0	1.0	100	10.0
	13	1.0	1.0	100	10.0
	17	0.5	1.0	100	5.0
	22	0.5	1.0	100	5.0
	31	0.5	1.0	100	5.0
	37	0.5	1.0	100	5.0
	44	0.5	1.0	100	5.0
	48	0.5	1.0	100	5.0
	53	0.5	1.0	100	5.0
	64	0.5	1.0	100	5.0
	71	0.5	1.0	100	5.0
	77	0.5	1.0	100	5.0
	84	0.5	1.0	100	5.0
	89	0.5	1.0	100	5.0
	95	0.5	1.0	100	5.0
	100	0.5	1.0	100	5.0
	110	0.5	1.0	100	5.0
	119	0.5	1.0	100	5.0
	128	0.5	1.0	100	5.0
	135	0.5	1.0	100	5.0
	149	0.5	1.0	100	5.0
	163	0.5	1.0	100	5.0
	170	0.5	1.0	100	5.0
	174	0.5	1.0	100	5.0
	194	0.5	1.0	100	5.0
	202	0.5	1.0	100	5.0
	207	0.5	1.0	100	5.0
Individual Stocks					
	11	2.0	0.50	100	10.0
	14	2.0	0.50	100	10.0
	30	1.0	0.80	100	8.0

	65	2.0	0.25	100	5.0
	166	1.0	0.50	100	5.0
	204	1.0	0.60	100	6.0
	o,p'-DDT	1.0	0.50	100	5.0
	p,p'-DDT	1.0	0.50	100	5.0
	p,p'-DDE	2.0	0.50	100	10.0
	Hexachlorobenzene	1.0	2.0	100	20.0
	Trans-nonachlor	1.0	0.50	100	5.0
	Aldrin	1.0	0.50	100	5.0
	Octachlorostyrene	2.0	0.25	100	5.0

Table 10. Concentrations for individual PCB congeners and selected pesticides in the PCB Common Calibration Standard.

PCB / Pesticide	Conc., ng/mL	PCB / Pesticide	Conc., ng/mL	PCB / Pesticide	Conc., ng/mL
4+10	20	44	5	135+144	10
7+9	20	37	5	123+149	10
6	10	42	5	118	5
8+5	20	41+71	10	114	5
HCB	20	64	5	131	5
14	10	100	5	*o,p'*-DDT	5
19	5	OCS	5	132+153+105	15
30	8	74	5	*p,p'*-DDT	5
12	10	70+76	10	163+138	10
13	10	66	5	126	5
18	5	95	5	166	5
15+17	15	91	5	128	5
16	5	56+60	10	167	5
32	5	92+84	10	174	5
26	5	89	5	202+171	10
31	5	101	5	156	5
28	5	99	5	204	6
33	5	*t*-Nona	5	172	5
53	5	119	5	180	5
22	5	83	5	199	5
45	5	97	5	169	5
52	5	81	5	170+190	10
49	5	87	5	201	5
Aldrin	5	85	5	207	5
47	5	*p,p'*-DDE	10	194	5
48	5	77	5	205	5
65	5	110	5	206	5

PCB Common Reference Standard

Stock Mixture

Instructions: Dilute 0.5 mL of three PCB custom standard mixtures to 50 mL in hexane as shown in Table 11.

Table 11. Table of PCB Common Reference Stock mixture.

Stock	PCB Congener	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
C-IADN-01			***0.5***	***50***	
	4	30.0	0.5	50	0.3
	7	30.0	0.5	50	0.3
	10	30.0	0.5	50	0.3
	15	30.0	0.5	50	0.3
	18	30.0	0.5	50	0.3
	28	30.0	0.5	50	0.3
	32	30.0	0.5	50	0.3
	41	30.0	0.5	50	0.3
	45	30.0	0.5	50	0.3
	52	30.0	0.5	50	0.3
	56	30.0	0.5	50	0.3
	66	30.0	0.5	50	0.3
	74	30.0	0.5	50	0.3
	81	30.0	0.5	50	0.3
	85	30.0	0.5	50	0.3
	91	30.0	0.5	50	0.3
	97	30.0	0.5	50	0.3
	101	30.0	0.5	50	0.3
	114	30.0	0.5	50	0.3
	123	30.0	0.5	50	0.3
	131	30.0	0.5	50	0.3
	138	30.0	0.5	50	0.3
	153	30.0	0.5	50	0.3
	167	30.0	0.5	50	0.3
	171	30.0	0.5	50	0.3
	180	30.0	0.5	50	0.3
	200	30.0	0.5	50	0.3
	205	30.0	0.5	50	0.3
C-IADN-02			***0.5***	***50***	
	5	30.0	0.5	50	0.3
	8	30.0	0.5	50	0.3
	12	30.0	0.5	50	0.3
	16	30.0	0.5	50	0.3
	19	30.0	0.5	50	0.3
	26	30.0	0.5	50	0.3
	33	30.0	0.5	50	0.3
	42	30.0	0.5	50	0.3
	47	30.0	0.5	50	0.3
	49	30.0	0.5	50	0.3
	60	30.0	0.5	50	0.3
	70	30.0	0.5	50	0.3
	76	30.0	0.5	50	0.3

	83	30.0	0.5	50	0.3
	87	30.0	0.5	50	0.3
	92	30.0	0.5	50	0.3
	99	30.0	0.5	50	0.3
	105	30.0	0.5	50	0.3
	118	30.0	0.5	50	0.3
	126	30.0	0.5	50	0.3
	132	30.0	0.5	50	0.3
	144	30.0	0.5	50	0.3
	156	30.0	0.5	50	0.3
	169	30.0	0.5	50	0.3
	172	30.0	0.5	50	0.3
	190	30.0	0.5	50	0.3
	199	30.0	0.5	50	0.3
	206	30.0	0.5	50	0.3
C-IADN-03			***0.5***	***50***	
	6	30.0	0.5	50	0.3
	9	30.0	0.5	50	0.3
	13	30.0	0.5	50	0.3
	17	30.0	0.5	50	0.3
	22	30.0	0.5	50	0.3
	31	30.0	0.5	50	0.3
	37	30.0	0.5	50	0.3
	44	30.0	0.5	50	0.3
	48	30.0	0.5	50	0.3
	53	30.0	0.5	50	0.3
	64	30.0	0.5	50	0.3
	71	30.0	0.5	50	0.3
	77	30.0	0.5	50	0.3
	84	30.0	0.5	50	0.3
	89	30.0	0.5	50	0.3
	95	30.0	0.5	50	0.3
	100	30.0	0.5	50	0.3
	110	30.0	0.5	50	0.3
	119	30.0	0.5	50	0.3
	128	30.0	0.5	50	0.3
	135	30.0	0.5	50	0.3
	149	30.0	0.5	50	0.3
	163	30.0	0.5	50	0.3
	170	30.0	0.5	50	0.3
	174	30.0	0.5	50	0.3
	194	30.0	0.5	50	0.3
	202	30.0	0.5	50	0.3
	207	30.0	0.5	50	0.3

Working Mixture

Instructions: Mix aliquot volumes of PCB Common Reference Stock Solution (Table 11), selected individual PCB standards (Table 6), and individual pesticide standards (Table 25) together as show in Table 12 and dilute to 100 mL in hexane.

Table 12. Table of PCB Common Reference Standard working mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
PCB CRS Stock	0.3	2.5	100	7.5
PCB 30	1.0	0.8	100	8.0
PCB 204	1.0	0.6	100	6.0
PCB 14	2.0	1.0	100	20.0
PCB 65	2.0	0.25	100	5.0
PCB 166	1.0	0.5	100	5.0
PCB 11	2.0	1.0	100	20.0
HCB	1.0	2.0	100	20.0
Octachlorostyrene	2.0	1.0	100	20.0
Aldrin	1.0	2.0	100	20.0
O,P'-DDT	1.0	2.0	100	20.0
P,P'-DDT	1.0	2.0	100	20.0
P,P'-DDE	2.0	1.0	100	20.0
T-Nona	1.0	2.0	100	20.0

Table 13. Concentration of PCB congeners and selected pesticides in the PCB Common Reference Standard working mixture.

PCB / Pesticide	Conc., ng/mL	PCB / Pesticide	Conc., ng/mL	PCB / Pesticide	Conc., ng/mL
4+10	15	44	7.5	135+144	15
7+9	15	37	7.5	123+149	15
6	7.5	42	7.5	118	7.5
8+5	15	41+71	15	114	7.5
HCB	20	64	7.5	131	7.5
14	20	100	7.5	o,p'-DDT	20
19	7.5	Octachlorostyrene	20	132+153+105	22.5
30	8	74	7.5	p,p'-DDT	20
12	7.5	70+76	15	163+138	15
13	7.5	66	7.5	126	7.5
18	7.5	95	7.5	166	5.0
15+17	15	91	7.5	128	7.5
16	7.5	56+60	15	167	7.5
32	7.5	92+84	15	174	7.5
26	7.5	89	7.5	202+171	15
31	7.5	101	7.5	156	7.5
28	7.5	99	7.5	204	6
33	7.5	t-Nona	20.0	172	7.5
53	7.5	119	7.5	180	7.5
22	7.5	83	7.5	199	7.5
45	7.5	97	7.5	169	7.5
52	7.5	81	7.5	170+190	15
49	7.5	87	7.5	201	7.5
Aldrin	20.0	85	7.5	207	7.5
47	7.5	p,p'-DDE	20.0	194	7.5
48	7.5	77	7.5	205	7.5
65	5.0	110	7.5	206	7.5

PCB Matrix Spike Recovery Standard
Instructions: Dilute aliquot of stock mixture S-97607 (Table 5) to 100 mL in hexane.

Table 14. Table of PCB matrix spike recovery standard working mixture.

Stock	PCB	PCB conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
S-97607		***90.5***	***0.1***	***100***	***90.5***
	4+10	3.0	0.1	100	3.0
	7+9	3.0	0.1	100	3.0
	6	1.5	0.1	100	1.5
	5+8	3.0	0.1	100	3.0
	19	1.0	0.1	100	1.0
	11	1.5	0.1	100	1.5
	12	1.5	0.1	100	1.5
	13	1.5	0.1	100	1.5
	18	1.0	0.1	100	1.0
	17+15	2.5	0.1	100	2.5
	16	1.0	0.1	100	1.0
	32	1.0	0.1	100	1.0
	26	1.0	0.1	100	1.0
	31	1.0	0.1	100	1.0
	28	1.0	0.1	100	1.0
	33	1.0	0.1	100	1.0
	53	1.0	0.1	100	1.0
	22	1.0	0.1	100	1.0
	45	1.0	0.1	100	1.0
	52	1.0	0.1	100	1.0
	49	1.0	0.1	100	1.0
	47	1.0	0.1	100	1.0
	48	1.0	0.1	100	1.0
	44	1.0	0.1	100	1.0
	37	1.0	0.1	100	1.0
	42	1.0	0.1	100	1.0
	41+71	2.0	0.1	100	2.0
	64	1.0	0.1	100	1.0
	100	1.0	0.1	100	1.0
	74	1.0	0.1	100	1.0
	70+76	2.0	0.1	100	2.0
	66	1.0	0.1	100	1.0
	95	1.0	0.1	100	1.0
	91	1.0	0.1	100	1.0
	56+60	2.0	0.1	100	2.0
	84+92	2.0	0.1	100	2.0
	89	1.0	0.1	100	1.0
	101	1.0	0.1	100	1.0
	99	1.0	0.1	100	1.0
	119	1.0	0.1	100	1.0

	83	1.0	0.1	100	1.0
	97	1.0	0.1	100	1.0
	81	1.0	0.1	100	1.0
	87	1.0	0.1	100	1.0
	85	1.0	0.1	100	1.0
	77	1.0	0.1	100	1.0
	110	1.0	0.1	100	1.0
	135+144	2.0	0.1	100	2.0
	123+149	2.0	0.1	100	2.0
	118	1.0	0.1	100	1.0
	114	1.0	0.1	100	1.0
	131	1.0	0.1	100	1.0
	105+132+153	3.0	0.1	100	3.0
	163+138	2.0	0.1	100	2.0
	126	1.0	0.1	100	1.0
	128	1.0	0.1	100	1.0
	167	1.0	0.1	100	1.0
	174	1.0	0.1	100	1.0
	202+171	2.0	0.1	100	2.0
	156	1.0	0.1	100	1.0
	172	1.0	0.1	100	1.0
	180	1.0	0.1	100	1.0
	199	1.0	0.1	100	1.0
	169	1.0	0.1	100	1.0
	170+190	2.0	0.1	100	2.0
	201	1.0	0.1	100	1.0
	207	1.0	0.1	100	1.0
	194	1.0	0.1	100	1.0
	205	1.0	0.1	100	1.0
	206	1.0	0.1	100	1.0

PCB Linearity Standard

Stock Mixture

Instructions: Dilute 100 µL of S-75951 (Table 4) standard to 10 mL with hexane as shown in Table 15.

Table 15. Table of PCB Linearity Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
S-75951	547.216	0.1	10	5,472.16

Working Mixture

Instructions: Perform serial dilutions of S-75951 standard (Table 15) to 3.0 mL in hexane as shown in Table 16.

Table 16. Table of PCB Linearity working mixtures

Level	Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
01	S-75951	5,472.16			5,472.16
02	S-75951	5,472.16	1.0	3.0	1,824.05
03	PCB Linearity 02	1,824.05	1.0	3.0	608.02
04	PCB Linearity 03	608.02	1.0	3.0	202.67
05	PCB Linearity 04	202.67	1.0	3.0	67.56
06	PCB Linearity 05	67.56	1.0	3.0	22.52
07	PCB Linearity 06	22.52	1.0	3.0	7.51
08	PCB Linearity 07	7.51	1.0	3.0	2.50
09	PCB Linearity 08	2.50	1.0	3.0	0.83
10	PCB Linearity 09	0.83	1.0	3.0	0.27

Table 17. Concentration of PCB congeners in PCB Linearity working mixtures.

PCB	Concentration (ng/mL) per Linearity Level									
	01	02	03	04	05	06	07	08	09	10
4+10	137.0	45.7	15.22	5.07	1.69	0.56	0.19	0.063	0.021	0.007
7+9	48.1	16.0	5.34	1.78	0.59	0.20	0.07	0.022	0.007	0.002
6	76.2	25.4	8.46	2.82	0.94	0.31	0.10	0.035	0.012	0.004
5+8	561.4	187.1	62.38	20.79	6.93	2.31	0.77	0.257	0.086	0.029
19	11.2	3.7	1.24	0.41	0.14	0.05	0.02	0.005	0.002	0.001
11	202.0	67.3	22.44	7.48	2.49	0.83	0.28	0.092	0.031	0.010
12	68.1	22.7	7.57	2.52	0.84	0.28	0.09	0.031	0.010	0.003
13	3.9	1.3	0.44	0.15	0.05	0.02	0.01	0.002	0.001	0.000
18	149.0	49.7	16.56	5.52	1.84	0.61	0.20	0.068	0.023	0.008
17+15	149.5	49.8	16.61	5.54	1.85	0.62	0.21	0.068	0.023	0.008
16	80.2	26.7	8.91	2.97	0.99	0.33	0.11	0.037	0.012	0.004
32	76.2	25.4	8.46	2.82	0.94	0.31	0.10	0.035	0.012	0.004
26	28.2	9.4	3.13	1.04	0.35	0.12	0.04	0.013	0.004	0.001
31	188.2	62.7	20.91	6.97	2.32	0.77	0.26	0.086	0.029	0.010
28	188.2	62.7	20.91	6.97	2.32	0.77	0.26	0.086	0.029	0.010
33	132.1	44.0	14.68	4.89	1.63	0.54	0.18	0.060	0.020	0.007
53	26.0	8.7	2.89	0.96	0.32	0.11	0.04	0.012	0.004	0.001
22	116.0	38.7	12.89	4.30	1.43	0.48	0.16	0.053	0.018	0.006
45	36.0	12.0	4.00	1.33	0.44	0.15	0.05	0.016	0.005	0.002
52	181.1	60.4	20.12	6.71	2.24	0.75	0.25	0.083	0.028	0.009
49	92.9	31.0	10.32	3.44	1.15	0.38	0.13	0.042	0.014	0.005
47	40.0	13.3	4.45	1.48	0.49	0.16	0.05	0.018	0.006	0.002
48	40.2	13.4	4.47	1.49	0.50	0.17	0.06	0.018	0.006	0.002
44	172.9	57.6	19.21	6.40	2.13	0.71	0.24	0.079	0.026	0.009
37	48.4	16.1	5.38	1.79	0.60	0.20	0.07	0.022	0.007	0.002

42	56.0	18.7	6.22	2.07	0.69	0.23	0.08	0.026	0.009	0.003
41+71	92.9	31.0	10.32	3.44	1.15	0.38	0.13	0.042	0.014	0.005
64	72.0	24.0	8.00	2.67	0.89	0.30	0.10	0.033	0.011	0.004
100	4.5	1.5	0.49	0.16	0.05	0.02	0.01	0.002	0.001	0.000
74	76.5	25.5	8.50	2.83	0.94	0.31	0.10	0.035	0.012	0.004
70+76	136.7	45.6	15.19	5.06	1.69	0.56	0.19	0.063	0.021	0.007
66	210.1	70.0	23.34	7.78	2.59	0.86	0.29	0.096	0.032	0.011
95	80.3	26.8	8.92	2.97	0.99	0.33	0.11	0.037	0.012	0.004
91	20.4	6.8	2.27	0.76	0.25	0.08	0.03	0.009	0.003	0.001
56+60	140.6	46.9	15.63	5.21	1.74	0.58	0.19	0.064	0.021	0.007
84+92	72.4	24.1	8.04	2.68	0.89	0.30	0.10	0.033	0.011	0.004
89	4.1	1.4	0.46	0.15	0.05	0.02	0.01	0.002	0.001	0.000
101	72.2	24.1	8.02	2.67	0.89	0.30	0.10	0.033	0.011	0.004
99	29.7	9.9	3.30	1.10	0.37	0.12	0.04	0.014	0.005	0.002
119	1.1	0.4	0.12	0.04	0.01	0.00	0.00	0.001	0.000	0.000
83	6.0	2.0	0.67	0.22	0.07	0.02	0.01	0.003	0.001	0.000
97	22.6	7.5	2.51	0.84	0.28	0.09	0.03	0.010	0.003	0.001
81	6.4	2.1	0.71	0.24	0.08	0.03	0.01	0.003	0.001	0.000
87	40.0	13.3	4.44	1.48	0.49	0.16	0.05	0.018	0.006	0.002
85	28.1	9.4	3.12	1.04	0.35	0.12	0.04	0.013	0.004	0.001
77	9.4	3.1	1.04	0.35	0.12	0.04	0.01	0.004	0.001	0.000
110	76.4	25.5	8.49	2.83	0.94	0.31	0.10	0.035	0.012	0.004
135+144	35.6	11.9	3.96	1.32	0.44	0.15	0.05	0.016	0.005	0.002
123+149	112.4	37.5	12.49	4.16	1.39	0.46	0.15	0.051	0.017	0.006
118	48.1	16.0	5.35	1.78	0.59	0.20	0.07	0.022	0.007	0.002
114	5.2	1.7	0.58	0.19	0.06	0.02	0.01	0.002	0.001	0.000
131	1.2	0.4	0.13	0.04	0.01	0.00	0.00	0.001	0.000	0.000
105+132+153	173.1	57.7	19.23	6.41	2.14	0.71	0.24	0.079	0.026	0.009
163+138	108.7	36.2	12.07	4.02	1.34	0.45	0.15	0.050	0.017	0.006
126	40.2	13.4	4.46	1.49	0.50	0.17	0.06	0.018	0.006	0.002
128	4.0	1.3	0.45	0.15	0.05	0.02	0.01	0.002	0.001	0.000
167	2.0	0.7	0.22	0.07	0.02	0.01	0.00	0.001	0.000	0.000
174	128.1	42.7	14.23	4.74	1.58	0.53	0.18	0.059	0.020	0.007
202+171	31.8	10.6	3.53	1.18	0.39	0.13	0.04	0.015	0.005	0.002
156	2.6	0.9	0.29	0.10	0.03	0.01	0.00	0.001	0.000	0.000
172	22.4	7.5	2.49	0.83	0.28	0.09	0.03	0.010	0.003	0.001
180	244.0	81.3	27.11	9.04	3.01	1.00	0.33	0.112	0.037	0.012
199	17.3	5.8	1.92	0.64	0.21	0.07	0.02	0.008	0.003	0.001
169	40.2	13.4	4.47	1.49	0.50	0.17	0.06	0.018	0.006	0.002
170+190	68.1	22.7	7.57	2.52	0.84	0.28	0.09	0.031	0.010	0.003
201	168.3	56.1	18.70	6.23	2.08	0.69	0.23	0.077	0.026	0.009
207	3.7	1.2	0.42	0.14	0.05	0.02	0.01	0.002	0.001	0.000
194	72.1	24.0	8.02	2.67	0.89	0.30	0.10	0.033	0.011	0.004
205	4.4	1.5	0.49	0.16	0.05	0.02	0.01	0.002	0.001	0.000
206	27.5	9.2	3.05	1.02	0.34	0.11	0.04	0.013	0.004	0.001

PCB IDL Standard
Stock Mixture

Instructions: Dilute 1.0 mL of CUS 937 custom PCB mixture to 100 mL in hexane as shown in Table 18.

Table 18. Table of the PCB IDL Stock Solution mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
CUS 937	52.79	1.0	100	527.9

Working Mixture

Instructions: Dilute 1.0 mL of PCB IDL Stock Standard (Table 18) to 100 mL in hexane.

Table 19. Table of the PCB IDL working mixture.

Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PCB IDL	527.9	1.0	100	5.279

Table 20. Table of individual PCB congeners and their concentrations in the PCB IDL working solution.

PCB	Conc., ng/mL
1	0.400
6	0.473
29	0.210
49	0.195
101	0.164
141	0.073
180	0.080
194	0.056
206	0.068
209	0.045

PESTICIDE STANDARDS
Pesticide custom and individual stock mixtures

Table 21. Table of Pesticide abbreviations

Full Name	Abbreviation
Dibutylchlorendate	DBC
Octachlorostyrene	OCS
trans-Nonachlor	t-Nona
Hexachlorobenzene	HCB

Table 22. Table of Pesticide custom and individual stock standards and their concentrations.

Standard	Vendor	Mixture Type	Catalog ID	Conc., µg/ml
US112B	Agilent	Mixture	ppm-508b-1	1,000
S-8206A	AccuStandard	Mixture	S-8206A	100
α-Chlordane	Agilent	Individual	pp-470-1	100
γ-Chlordane	Agilent	Individual	pp-480-1	100
trans-Nonachlor (t-Nona)	Agilent	Individual	pp-500-1	100
Oxychlordane	AccuStandard	Individual	p-331s-h	100
Dibutylchlorendate (DBC)	Agilent	Individual	sts-280n-1	2,000
o,p'-DDD	Agilent	Individual	pst-210s	100
o,p'-DDT	Agilent	Individual	pst-271s	100
p,p'-DDD	Agilent	Individual	pp-160-1	100
p,p'-DDE	Agilent	Individual	pp-170-1	100
p,p'-DDT	Agilent	Individual	pp-180-1	100
α-HCH	Agilent	Individual	pp-110	100
β-HCH	Agilent	Individual	EPA-1077	1,000
δ-HCH	Agilent	Individual	EPA-1078	100
ε-HCH	Chem Service	Individual	ps-2222	100
γ-HCH	Agilent	Individual	pp-140	100
Aldrin	Agilent	Individual	pp-100	100
Endrin	AccuStandard	Individual	pp-230-1	100
Dieldrin	Agilent	Individual	pp-190	100
Endosulfan I	Agilent	Individual	pp-200	100
Endosulfan II	Agilent	Individual	pp-210	100
Endosulfan sulfate	Agilent	Individual	pp-220	100
Heptachlor Epoxide (isomer B)	Agilent	Individual	EPA-1164	1,000
Methoxychlor	AccuStandard	Individual	app-9-127	100
Octachlorostyrene (OCS)	Chem Service	Individual	S-12710X1	100
Hexachlorobenzene (HCB)	Agilent	Individual	ch-151-1	100

Table 23. Table of pesticides and their concentrations in US112B custom stock mixture.

Pesticide	Conc., µg/mL
Aldrin	1,000
α-HCH	1,000
β-HCH	1,000
γ-HCH	1,000
δ-HCH	1,000
p,p'-DDD	1,000
p,p'-DDE	1,000
p,p'-DDT	1,000
Dieldrin	1,000
Endosulfan I	1,000
Endosulfan II	1,000
Endosulfan Sulfate	1,000
Endrin	1,000
Endrin Aldehyde	1,000
Heptachlor	1,000
Heptachlor Epoxide (B)	1,000
Methoxychlor	1,000

Table 24. Table of pesticides and their concentrations in S-8206A custom stock mixture.

Pesticide	Conc., µg/mL
Hexachlorobenzene	100
α-HCH	100
β-HCH	100
γ-HCH	100
Heptachlor Epoxide (B)	100
α-Chlordane	100
γ-Chlordane	100
trans-Nonachlor	100
Methoxychlor	100
Endosulfan I	100
Endosulfan II	100
Endosulfan sulfate	100
p,p'-DDD	100
p,p'-DDE	100
p,p'-DDT	100
o,p'-DDT	100
Aldrin	100
Endrin	100
Dieldrin	100

Pesticide Individual Stock Solutions

Instructions: Dilute with hexane indicated aliquot volumes of each custom and individual pesticide stock standard as shown in Table 25. Each solution is prepared separately.

Table 25: Table of pesticide stock solutions.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
US112B	1,000	0.1	50	2,000
α-Chlordane	100	1.0	100	1,000
γ-Chlordane	100	1.0	100	1,000
t-Nona	100	1.0	100	1,000
Oxychlordane	100	1.0	100	1,000
DBC	2,000	0.1	100	2,000
o,p'-DDD	100	1.0	100	1,000
o,p'-DDT	100	1.0	100	1,000
p,p'-DDD	100	1.0	50	2,000
p,p'-DDE	100	1.0	50	2,000
p,p'-DDT	100	1.0	100	1,000
α-HCH	100	1.0	50	2,000
β-HCH	1,000	1.0	100	10,000
β-HCH	10	1.0	50	200
δ-HCH	100	1.0	50	2,000
Ɛ-HCH	100	1.0	50	2,000
γ-HCH	100	1.0	50	2,000
Aldrin	100	1.0	100	1,000
Endrin	100	1.0	50	2,000

Dieldrin	100	1.0	50	2,000
Endosulfan I	100	1.0	100	1,000
Endosulfan II	100	1.0	100	1,000
Endosulfan sulfate	100	1.0	100	1,000
Heptachlor Epoxide (B)	1,000	1.0	100	10,000
Methoxychlor	100	1.0	50	2,000
OCS	100	2.0	100	2,000
HCB	100	1.0	100	1,000

Pesticide Internal Standard (IS)
Working mixture

Instructions: Mix aliquot volumes of PCB-65 and -155 stock standards (Table 6) as shown in Table 26 and dilute to 100 mL with hexane.

Table 26. Table of working Pesticide Internal Standard mixture.

Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PCB-65	2,000	10	100	200
PCB-155	2,000	10	100	200

Pesticide Surrogate Recovery Standard (SS)

Instructions: See Table 8 in the PCB section.

Pesticide Common Calibration Standard

Instructions: Mix aliquot volumes of stock pesticide mixture US112B (Table 23), selected individual pesticides (Table 25), and selected individual PCB standards (Table 6) together as shown in Table 27 and dilute to 100 mL with hexane.

Table 27. Table of Pesticide Common Calibration Standard.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
US112B			***1.0***	***100***	
	Aldrin	2,000	1.0	100	20
	α-HCH	2,000	1.0	100	20
	β-HCH	2,000	1.0	100	20
	γ-HCH	2,000	1.0	100	20
	δ-HCH	2,000	1.0	100	20
	p,p'-DDD	2,000	1.0	100	20
	p,p'-DDE	2,000	1.0	100	20
	p,p'-DDT	2,000	1.0	100	20
	Dieldrin	2,000	1.0	100	20
	Endosulfan I	2,000	1.0	100	20

	Endosulfan II	2,000	1.0	100	20
	Endosulfan Sulfate	2,000	1.0	100	20
	Endrin	2,000	1.0	100	20
	Endrin Aldehyde	2,000	1.0	100	20
	Heptachlor	2,000	1.0	100	20
	Heptachlor Epoxide	2,000	1.0	100	20
	Methoxychlor	2,000	1.0	100	20
Individual Standards					
	α-chlordane	1,000	2.0	100	20
	γ-chlordane	1,000	2.0	100	20
	t-Nona	1,000	2.0	100	20
	Oxychlordane	1,000	2.0	100	20
	DBC	2,000	1.0	100	20
	PCB-65	2,000	1.0	100	20
	PCB-155	2,000	1.0	100	20
	o,p'-DDD	1,000	2.0	100	20
	o,p'-DDT	1,000	2.0	100	20
	HCB	1,000	2.0	100	20
	Ɛ-HCH	2,000	1.0	100	20

Table 28. Concentrations of individual compounds in the Pesticide Common Calibration Standard mixture.

Compound	Conc., ng/mL
α-HCH	20
β-HCH	20
γ-HCH	20
δ-HCH	20
Ɛ-HCH	20
Heptachlor	20
Heptachlor Epoxide	20
Aldrin	20
Dieldrin	20
Endrin	20
p,p'-DDT	20
p,p'-DDD	20
p,p'-DDE	20
o,p'-DDD	20
o,p'-DDT	20
α-Chlordane	20
γ-Chlordane	20
Oxychlordane	20
t-Nona	20
Methoxychlor	20
Endosulfan I	20
Endosulfan II	20
Endosulfan sulfate	20
HCB	20
DBC	20
PCB-155	20
PCB-65	20

Pesticide Common Reference Standard

Working Mixture

Instructions: Mix indicated aliquot of custom pesticide mixture S-8206A (Table 24) and selected PCB standards (Table 6) together as shown in Table 29 and dilute to 100 mL with hexane.

Table 29. Table of Pesticide Common Reference Standard mixture.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
S-8206A			***0.025***	***100***	
	HCB	100	0.025	100	25
	α-HCH	100	0.025	100	25
	β-HCH	100	0.025	100	25
	γ-HCH	100	0.025	100	25
	Heptachlor Epoxide	100	0.025	100	25
	α-Chlordane	100	0.025	100	25
	γ-Chlordane	100	0.025	100	25
	t-Nona	100	0.025	100	25
	Methoxychlor	100	0.025	100	25
	Endosulfan I	100	0.025	100	25
	Endosulfan II	100	0.025	100	25
	Endosulfan sulfate	100	0.025	100	25
	p,p'-DDD	100	0.025	100	25
	p,p'-DDE	100	0.025	100	25
	p,p'-DDT	100	0.025	100	25
	o,p'-DDT	100	0.025	100	25
	Aldrin	100	0.025	100	25
	Endrin	100	0.025	100	25
	Dieldrin	100	0.025	100	25
Individual Standards					
	PCB-65	2.0	1.0	100	20
	PCB-155	2.0	1.0	100	20
	DBC	2.0	1.0	100	20
	ε-HCH	2.0	1.0	100	20
	δ-HCH	2.0	1.0	100	20

Table 30. Table of pesticides and their concentrations in the Pesticide Common Reference Standard mixture.

Compound	Conc., ng/mL
HCB	25
α-HCH	25
β-HCH	25
γ-HCH	25
heptachlor Epoxide	25
α-Chlordane	25
γ-Chlordane	25
t-Nona	25
Methoxychlor	25
Endosulfan I	25
Endosulfan II	25

Endosulfan sulfate	25
p,p'-DDD	25
p,p'-DDE	25
p,p'-DDT	25
o,p'-DDT	25
Aldrin	25
Endrin	25
Dieldrin	25
PCB-65	20
PCB-155	20
DBC	20
Ɛ-HCH	20
δ-HCH	20

Pesticide Matrix Spike Recovery Standard

Instructions: Mix aliquot volumes of the custom pesticide mixture S-8206A (Table 24)and select individual pesticide compounds (Table 25) as shown in Table 31 and dilute to 100 mL with hexane.

Table 31. Table of Pesticide Matrix Spike Recovery Standard mixture.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
S-8206A			***0.1***	***100***	
	HCB	100	0.1	100	100
	α-HCH	100	0.1	100	100
	β-HCH	100	0.1	100	100
	γ-HCH	100	0.1	100	100
	Heptachlor Epoxide	100	0.1	100	100
	α-Chlordane	100	0.1	100	100
	γ-Chlordane	100	0.1	100	100
	t-Nona	100	0.1	100	100
	Methoxychlor	100	0.1	100	100
	Endosulfan I	100	0.1	100	100
	Endosulfan II	100	0.1	100	100
	Endosulfan sulfate	100	0.1	100	100
	p,p'-DDD	100	0.1	100	100
	p,p'-DDE	100	0.1	100	100
	p,p'-DDT	100	0.1	100	100
	o,p'-DDT	100	0.1	100	100
	Aldrin	100	0.1	100	100
	Endrin	100	0.1	100	100
	Dieldrin	100	0.1	100	100
Individual Standards					
	OCS	2.0	5.0	100	100
	Oxychlordane	1.0	10.0	100	100
	o,p'-DDD	1.0	10.0	100	100

Table 32. Table of pesticides and their concentrations in the Pesticide Matrix Spike Recovery Standard mixture.

Compound	Conc., ng/mL
Hexachlorobenzene	100
α-HCH	100
β-HCH	100
γ-HCH	100
heptachlor epoxide	100
α-Chlordane	100
γ-Chlordane	100
trans-Nonachlor	100
Methoxychlor	100
Endosulfan I	100
Endosulfan II	100
Endosulfan sulfate	100
p,p'-DDD	100
p,p'-DDE	100
p,p'-DDT	100
o,p'-DDT	100
Aldrin	100
Endrin	100
Dieldrin	100
Octachlorostyrene	100
Oxychlordane	100
o,p'-DDD	100

Pesticide Linearity Standards

Stock Mixtures

Instructions: Two separate standards are used to prepare pesticide linearity solutions.

Pest Linearity Stock I: Combine the indicated aliquot volumes of S-8206A custom pest mixture (Table 24) and selected individual pesticide standards (Table 25), then dilute to 50 mL with hexane as shown in Table 33.

Pest Linearity Stock II: Combine the indicated aliquot volumes of selected individual pesticide standards (Table 25), then dilute to 25 mL with hexane as shown in Table 34.

Table 33. Table of pesticide linearity stock solution I.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
S-8206A			***0.05***	***50***	
	HCB	100	0.05	50	100
	α-HCH	100	0.05	50	100
	β-HCH	100	0.05	50	100
	γ-HCH	100	0.05	50	100
	Heptachlor Epoxide	100	0.05	50	100
	α-Chlordane	100	0.05	50	100
	γ-Chlordane	100	0.05	50	100

	t-Nona	100	0.05	50	100
	Methoxychlor	100	0.05	50	100
	Endosulfan I	100	0.05	50	100
	Endosulfan II	100	0.05	50	100
	Endosulfan sulfate	100	0.05	50	100
	p,p'-DDD	100	0.05	50	100
	p,p'-DDE	100	0.05	50	100
	p,p'-DDT	100	0.05	50	100
	o,p'-DDT	100	0.05	50	100
	Aldrin	100	0.05	50	100
	Endrin	100	0.05	50	100
	Dieldrin	100	0.05	50	100
Individual Standards					
	Oxychlordane	1.0	5.0	50	100
	o,p'-DDD	1.0	5.0	50	100

Table 34. Table of pesticide linearity stock solution II.

Compound	Stock conc., ug /mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Endosulfan I	1.0	6.25	25	250
Dieldrin	2.0	3.125	25	250
HCB	1.0	6.25	25	250
OCS	0.2	3.75	25	30

Working Mixtures

Instructions: Perform serial dilutions of Pesticide Linearity Stock Solutions I & II (Tables 35 & 36) with hexane as shown in Tables 35 & 36. Each dilution is done separately.

Table 35. Table of Pesticide Linearity I working standards.

Level	Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
01	Pest Linearity Stock I	100			100
02	Pest Linearity Stock I	100	2.0	4.0	50
03	Pest Linearity I Lvl 02	50	2.0	4.0	25
04	Pest Linearity I Lvl 03	25	1.0	2.5	10
05	Pest Linearity I Lvl 04	10	0.5	2.5	2
06	Pest Linearity I Lvl 05	2	0.5	2.5	0.4
07	Pest Linearity I Lvl 06	0.4	0.5	2	0.1
08	Pest Linearity I Lvl 07	0.1	1	2	0.05
09	Pest Linearity I Lvl 08	0.05	0.5	2	0.01

Table 36. Table of Pesticide Linearity II working standards.

Level	Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
01	Pest Linearity Stock II	250 (30)			250 (30)
02	Pest Linearity Stock II	250 (30)	1.2	3.0	100 (12)

03	Pest Linearity II Lvl 02	100 (12)	1.0	2.0	50 (6)
04	Pest Linearity II Lvl 03	50 (6)	1.0	2.0	25 (3)
05	Pest Linearity II Lvl 04	25 (3)	1.0	2.5	10 (1.2)
06	Pest Linearity II Lvl 05	10 (1.2)	0.5	2.5	2 (0.24)
07	Pest Linearity II Lvl 06	2 (0.24)	0.5	2.5	0.4 (0.048)
08	Pest Linearity II Lvl 07	0.4 (0.048)	0.5	2.0	0.1 (0.012)
09	Pest Linearity II Lvl 08	0.1 (0.012)	1.0	2.0	0.05 (0.006)
10	Pest Linearity II Lvl 09	0.05 (0.006)	0.5	2.0	0.01 (0.001)

Table 37. Concentration of pesticide compounds in the Pesticide Linearity I working mixtures.

PCB	Concentration (ng/mL) per Linearity Level								
	01	02	03	04	05	06	07	08	09
HCB	100	50	25	10	2.0	0.4	0.1	0.05	0.01
α-HCH	100	50	25	10	2.0	0.4	0.1	0.05	0.01
β-HCH	100	50	25	10	2.0	0.4	0.1	0.05	0.01
γ-HCH	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Heptachlor Epoxide	100	50	25	10	2.0	0.4	0.1	0.05	0.01
α-Chlordane	100	50	25	10	2.0	0.4	0.1	0.05	0.01
γ-Chlordane	100	50	25	10	2.0	0.4	0.1	0.05	0.01
t-Nona	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Methoxychlor	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Endosulfan I	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Endosulfan II	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Endosulfan sulfate	100	50	25	10	2.0	0.4	0.1	0.05	0.01
p,p'-DDD	100	50	25	10	2.0	0.4	0.1	0.05	0.01
p,p'-DDE	100	50	25	10	2.0	0.4	0.1	0.05	0.01
p,p'-DDT	100	50	25	10	2.0	0.4	0.1	0.05	0.01
o,p'-DDT	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Aldrin	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Endrin	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Dieldrin	100	50	25	10	2.0	0.4	0.1	0.05	0.01
Oxychlordane	100	50	25	10	2.0	0.4	0.1	0.05	0.01
o,p'-DDD	100	50	25	10	2.0	0.4	0.1	0.05	0.01

Table 38. Concentration of pesticide compounds in the Pesticide Linearity II working mixtures.

PCB	Concentration (ng/mL) per Linearity Level									
	01	02	03	04	05	06	07	08	09	10
Endosulfan I	250	100	50	25	10	2.0	0.4	0.1	0.025	0.006
Dieldrin	250	100	50	25	10	2.0	0.4	0.1	0.025	0.006
HCB	250	100	50	25	10	2.0	0.4	0.1	0.025	0.006
OCS	30	12	6	3	1.2	0.24	0.048	0.012	0.003	0.001

Pesticide IDL Standard

Stock Mixtures

Instructions: Two separate standards are used to prepare pesticide IDL solutions.

Stock IDL Standard I: Mix the indicated aliquot volumes of selected pesticides stock solutions (Table 25) as shown in Table 39 and dilute to 50 mL in hexane.

Stock IDL Standard II: Mix the indicated aliquot volumes of selected pesticides stock solutions (Table 25) as shown in Table 40 and dilute to 50 mL in hexane.

Table 39. Table of Pesticide Stock IDL Standard I mixture.

Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
α-HCH	2,000	2.5	50	100
β-HCH	2,000	2.5	50	100
α-Chlordane	1,000	5.0	50	100
γ-Chlordane	1,000	5.0	50	100
t-Nona	1,000	5.0	50	100
Dieldrin	2,000	2.5	50	100
p,p'-DDD	2,000	2.5	50	100
p,p'-DDE	2,000	2.5	50	100
p,p'-DDT	1,000	5.0	50	100
HCB	1,000	5.0	50	100

Table 40. Table of Pesticide Stock IDL Standard II mixture.

Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Endosulfan I	1,000	5.0	50	100
Endosulfan II	1,000	5.0	50	100
Endosulfan sulfate	1,000	5.0	50	100
Heptachlor Epoxide	10,000	0.5	50	100
β-HCH	10,000	0.5	50	100
Aldrin	1,000	5.0	50	100
Oxychlordane	1,000	5.0	50	100
Endrin	2,000	2.5	50	100
o,p'-DDD	1,000	5.0	50	100
o,p'-DDT	1,000	5.0	50	100
OCS	2,000	2.5	50	100
Methoxychlor	2,000	2.5	50	100

Working Mixture

Instructions: Mix the indicated aliquot volumes of Pesticide Stock IDL Standards I & II (Tables 39 and 40) and PCB-155 and -65 standards (Table 6) as shown in Table 41 and dilute to 50 mL in hexane.

Table 41. Table of the Pesticide IDL working standard mixture.

Stock	Stock conc., ng/mL	Aliquot, µL	Final Vol., mL	Final conc., ng/mL
Pest Stock IDL I	100	250	50	0.50
Pest Stock IDL II	100 (105 OCS)	250	50	0.50 (0.525 OSC)

PCB-155	2,000	25	50	1
PCB-65	2,000	25	50	1

Table 42. Levels of individual Pesticide compounds in the Pest IDL working standard.

Compound	Conc., ng/mL
α-HCH	0.5
β-HCH	0.5
α-Chlordane	0.5
γ-Chlordane	0.5
t-Nona	0.5
Dieldrin	0.5
p,p'-DDD	0.5
p,p'-DDE	0.5
p,p'-DDT	0.5
HCB	0.5
Endosulfan I	0.5
Endosulfan II	0.5
Endosulfan sulfate	0.5
Heptachlor Epoxide	0.5
β-HCH	0.5
Aldrin	0.5
Oxychlordane	0.5
Endrin	0.5
o,p'-DDD	0.5
o,p'-DDT	0.5
OCS	0.525
Methoxychlor	0.5
PCB-155	1.0
PCB-65	1.0

PAH Standards

PAH Custom and individual stock standards

Table 43. PAH Custom and individual stock standards.

Stock	Vendor	Mixture Type	Catalog ID	Conc., µg/mL
S-8206B	AccuStandard	Mixture	S-8206B	100
PAH Mixture	Agilent	Mixture	PM-611-1	100
Retene	AccuStandard	Individual Compound	H-250S	50
Retene	Chem Service	Individual Compound	13178U1-1 mL	100
Coronene	Chem Service	Individual Compound	S-11505U1-1 mL	100
Benzo[e]pyrene	Chem Service	Individual Compound	S-11166U1-1 mL	100
d_{12}-Perylene	Agilent	Individual Compound	ATS-150-1	2,000
d_{12}- Benz[a]anthracene	Agilent	Individual Compound	IST-120-1	1,000
d_{10}-Anthracene	Agilent	Individual Compound	IST-110-1	1,000

Table 44. Table of PAHs and their concentrations in S-8206B and PAH Mixture custom stock solutions.

S-8206B	PAH Mixture	Conc., µg/mL
Fluorene	Naphthalene	100
Phenanthrene	Acenaphthene	100

Anthracene	Acenaphthylene	100
Fluoranthene	Fluorene	100
Pyrene	Phenanthrene	100
Benz[a]anthracene	Anthracene	100
Triphenylene	Fluoranthene	100
Chrysene	Pyrene	100
Benzo[b]fluoranthene	Benz[a]anthracene	100
Benzo[k]fluoranthene	Chrysene	100
Benzo[e]pyrene	Benzo[b]fluoranthene	100
Benzo[a]pyrene	Benzo[k]fluoranthene	100
Indeno(1,2,3-cd)pyrene	Benzo[a]pyrene	100
Dibenz[a,h]anthracene	Indeno(1,2,3-cd)pyrene	100
Benzo[g,h,i]perylene	Dibenz[a,h]anthracene	100
Coronene	Benzo[g,h,i]perylene	100

PAH Internal Standard

Stock Mixture

Instructions: Mix indicated aliquot volumes of stock d12-Perylene, d12-Benz[a]anthracene, d10-Anthracene standards as shown in Table 45 and dilute to 50 mL in hexane.

Table 45. Table of PAH Internal Standard Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
d_{12}-Perylene	2,000	0.5	50	20
d_{12}-Benz[a]anthracene	1,000	1	50	20
d_{10}-Anthracene	1,000	1	50	20

Working Mixture

Instructions: Dilute 10 mL of stock PAH Internal Standard solution (Tables 44) in 50 mL of hexane as shown in Table 46.

Table 46. Table of PAH Internal Standard Working mixture.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
PAH Internal Standard Stock			***10***	***50***	
	d_{12}-Perylene	20	10	50	4
	d_{12}-Benz[a]anthracene	20	10	50	4
	d_{10}-Anthracene	20	10	50	4

PAH Surrogate Recovery Standard (SS)

Stock Mixture

Instructions: Mix indicated aliquot volumes of stock d10-Phenathrene and d10-Pyrene as shown in Table 47 and dilute to 50 mL in hexane.

Table 47. Table of PAH Surrogate Recovery Standard Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
d_{10}-Phenathrene	1,000	1.0	50	20
d_{10}-Pyrene (2 ampoules)	500	2.0 (1 mL/amp)	50	20

Working Mixture

Instructions: Dilute 10 mL of the stock PAH Surrogate Recovery Stock mixture (Table 46) in 50 mL of hexane as shown in Table 48.

Table 48. Table of PAH Surrogate Recovery Standard working mixture.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
PAH Surrogate Recovery Stock			***10***	***50***	
	d_{10}-Phenathrene	20	10	50	4
	d_{10}-Pyrene	20	10	50	4

PAH Calibration Standard

Instructions: Mix the indicated aliquot volumes of PAH matrix spike (Table 54), PAH IS Stock mix (Table 45), and PAH SS Stock mix (Tables 47) as shown in Table 49 and dilute to 50 mL in hexane.

Table 49. Table of the PAH Calibration Standard

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PAH Matrix Spike Stock			***5.0***	***50***	
	Naphthalene	2.0	5.0	50	200
	Acenaphthene	2.0	5.0	50	200
	Acenaphthylene	2.0	5.0	50	200
	Fluorene	2.0	5.0	50	200
	Phenanthrene	2.0	5.0	50	200
	Anthracene	2.0	5.0	50	200
	Fluoranthene	2.0	5.0	50	200
	Pyrene	2.0	5.0	50	200
	Retene	2.0	5.0	50	200
	Benz[a]anthracene	2.0	5.0	50	200
	Chrysene	2.0	5.0	50	200
	Benzo[b]fluoranthene	2.0	5.0	50	200
	Benzo[k]fluoranthene	2.0	5.0	50	200
	Benzo[e]pyrene	2.0	5.0	50	200
	Benzo[a]pyrene	2.0	5.0	50	200
	Indeno(1,2,3-cd)pyrene	2.0	5.0	50	200
	Dibenz[a,h]anthracene	2.0	5.0	50	200
	Benzo[g,h,i]perylene	2.0	5.0	50	200
	Coronene	2.0	5.0	50	200
PAH IS Stock			***0.5***	***50***	
	d_{12}-Perylene	20	0.5	50	200
	d_{12}-Benz[a]anthracene	20	0.5	50	200

	d_{10}-Anthracene	20	0.5	50	200
PAH SS Stock			***0.5***	***50***	
	d_{10}-Phenathrene	20	0.5	50	200
	d_{10}-Pyrene	20	0.5	50	200

PAH Common Reference Standard

Stock Mixtures

Instructions: Two separate standards are prepared for checking instrument PAH calibration.

PAH CRS (QAQC) Stock: Dilute 1.0 mL of stock S-8206B standard to 50 mL in hexane as shown in Table 50.

Retene CRS Stock: Dilute 1.0 mL of stock H-250S to 50 mL of hexane as shown in Table 51.

Table 50. Table of PAH CRS (QAQC) Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
S-8206B	100	1.0	50	2.0

Table 51. Table of Retene CRS Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
H-250S	50	1.0	50	1.0

Working Mixtures

Instructions: Two separate standards are prepared.

PAH Combined Reference Standard: Mix the indicated aliquot volumes of PAH Common Reference Standard (QA/QC) (Table 50), Retene CRS Stock (Table 51), PAH IS Stock (Table 45), and PAH SS Stock (Table 47) and dilute to 50 mL in hexane as shown in Table 52.

Retene CRS: Mix the indicated aliquot volumes of Retene CRS Stock (Table 51), PAH IS Stock (Table 45), and PAH SS Stock (Table 47) and dilute to 50 mL with hexane as shown in Table 53.

Table 52. Table of PAH Combined Common Reference Standard.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PAH CRS QAQC Stock Mix			***5.0***	***50***	
	Fluorene	2.0	5.0	50	200
	Phenanthrene	2.0	5.0	50	200
	Anthracene	2.0	5.0	50	200
	Fluoranthene	2.0	5.0	50	200
	Pyrene	2.0	5.0	50	200
	Benz[a]anthracene	2.0	5.0	50	200
	Triphenylene	2.0	5.0	50	200
	Chrysene	2.0	5.0	50	200

	Benzo[b]fluoranthene	2.0	5.0	50	200
	Benzo[k]fluoranthene	2.0	5.0	50	200
	Benzo[e]pyrene	2.0	5.0	50	200
	Benzo[a]pyrene	2.0	5.0	50	200
	Indeno(1,2,3-cd)pyrene	2.0	5.0	50	200
	Dibenz[a,h]anthracene	2.0	5.0	50	200
	Benzo[g,h,i]perylene	2.0	5.0	50	200
	Coronene	2.0	5.0	50	200
Retene CRS Stock			***10.0***	***50***	
	Retene	1.0	10.0	50	200
PAH IS Stock			***0.5***	***50***	
	d_{12}-Perylene	20	0.5	50	200
	d_{12}-Benz[a]anthracene	20	0.5	50	200
	d_{10}-Anthracene	20	0.5	50	200
PAH SS Stock			***0.5***	***50***	
	d_{10}-Phenathrene	20	0.5	50	200
	d_{10}-Pyrene	20	0.5	50	200

Table 53. Table of Retene Common Reference Standard.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Retene CRS Stock			***10.0***	***50***	
	Retene	1.0	10.0	50	200
PAH IS Stock			***0.5***	***50***	
	d_{12}-Perylene	20	0.5	50	200
	d_{12}-Benz[a]anthracene	20	0.5	50	200
	d_{10}-Anthracene	20	0.5	50	200
PAH SS Stock			***0.5***	***50***	
	d_{10}-Phenathrene	20	0.5	50	200
	d_{10}-Pyrene	20	0.5	50	200

Matrix Spike

Stock Mixture

Instructions: Mix indicated aliquot volumes of stock PAH mixture (Table 44) and selected individual PAHs (Table 43) as shown in Table 54 and dilute to 50 mL in hexane

Table 54. Table of the PAH Matrix Spike stock solution.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., µg/mL
PAH Mixture			***1.0***	***50***	
	Naphthalene	100	1.0	50	2.0
	Acenaphthene	100	1.0	50	2.0
	Acenaphthylene	100	1.0	50	2.0
	Fluorene	100	1.0	50	2.0
	Phenanthrene	100	1.0	50	2.0

	Anthracene	100	1.0	50	2.0
	Fluoranthene	100	1.0	50	2.0
	Pyrene	100	1.0	50	2.0
	Benz[a]anthracene	100	1.0	50	2.0
	Chrysene	100	1.0	50	2.0
	Benzo[b]fluoranthene	100	1.0	50	2.0
	Benzo[k]fluoranthene	100	1.0	50	2.0
	Benzo[a]pyrene	100	1.0	50	2.0
	Indeno(1,2,3-cd)pyrene	100	1.0	50	2.0
	Dibenz[a,h]anthracene	100	1.0	50	2.0
	Benzo[g,h,i]perylene	100	1.0	50	2.0
Individual Stocks			***10.0***	***50***	
	Retene	100	10.0	50	2.0
	Coronene	100	0.5	50	2.0
	Benzo[e]pyrene	100	0.5	50	2.0

PAH Linearity Standards

Instructions: Perform dilutions of the PAH Matrix Spike Recovery stock solution (Tables 54) as shown in Table 55. Each dilution is done separately.

Table 55. Table of PAH Linearity Standards.

Level	Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
01	PAH Matrix Spike Stock	2,000			2,000
02	PAH Matrix Spike Stock	2,000	1.0	4.0	1,000
	PAH SS Working	4,000	1.0	4.0	1,000
03	PAH LIN 02	1,000	0.5	1.0	500
04	PAH LIN 02	1,000	0.4	1.0	400
05	PAH LIN 02	1,000	0.3	1.0	300
06	PAH LIN 02	1,000	0.2	1.0	200
07	PAH LIN 02	1,000	0.2	2.0	100
08	PAH LIN 02	1,000	0.05	1.0	50
09	PAH LIN 07	100	0.2	2.0	10
10	PAH LIN 09	10	0.1	1.0	1.0
11	PAH LIN 09	10	0.05	5.0	0.1

Table 56. Concentrations of PAH compounds from the IADN annual reporting list in the various Linearity levels.

Compound	Concentration per level (ng/mL)										
	01	02	03	04	05	06	07	08	09	10	11
Fluorene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Phenanthrene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
d10-Phenanthrene		1,000	500	400	300	200	100	50	10	1.0	0.1
Anthracene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1

Fluoranthene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Pyrene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
d10-Pyrene		1,000	500	400	300	200	100	50	10	1.0	0.1
Retene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benz[a]anthracene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Chrysene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benzo[b]fluoranthene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benzo[k]fluoranthene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benzo[e]pyrene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benzo[a]pyrene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Indeno(1,2,3-cd)pyrene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Dibenz[a,h]anthracene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Benzo[g,h,i]perylene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1
Coronene	2,000	1,000	500	400	300	200	100	50	10	1.0	0.1

PAH IDL Standard

Instructions: Dilute PAH Matrix Spike Stock mixture (Table 54) and PAH IS Working (Table 46) as shown in Table 57.

Table 57. Table of the working PAH IDL Standard.

Stock	Compound	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PAH Matrix Spike Stock			***0.25***	***100***	
	Naphthalene	2.0	0.25	100	5.0
	Acenaphthene	2.0	0.25	100	5.0
	Acenaphthylene	2.0	0.25	100	5.0
	Fluorene	2.0	0.25	100	5.0
	Phenanthrene	2.0	0.25	100	5.0
	Anthracene	2.0	0.25	100	5.0
	Fluoranthene	2.0	0.25	100	5.0
	Pyrene	2.0	0.25	100	5.0
	Retene	2.0	0.25	100	5.0
	Benz[a]anthracene	2.0	0.25	100	5.0
	Chrysene	2.0	0.25	100	5.0
	Benzo[b]fluoranthene	2.0	0.25	100	5.0
	Benzo[k]fluoranthene	2.0	0.25	100	5.0
	Benzo[e]pyrene	2.0	0.25	100	5.0
	Benzo[a]pyrene	2.0	0.25	100	5.0
	Indeno(1,2,3-cd)pyrene	2.0	0.25	100	5.0
	Dibenz[a,h]anthracene	2.0	0.25	100	5.0
	Benzo[g,h,i]perylene	2.0	0.25	100	5.0
	Coronene	2.0	0.25	100	5.0
PAH IS Working			***5.0***	***100***	
	d_{12}-Perylene	4.0	5.0	100	200
	d_{12}-Benz[a]anthracene	4.0	5.0	100	200
	d_{10}-Anthracene	4.0	5.0	100	200

PBDE Standards

Table 58. Table of PBDE/BFR stock mixture and individual standards.

Stock	Vendor	Mixture Type	Solvent	Catalog ID	Purpose	Conc., µg/mL
BDE-MXE	Wellington	Mixture	Toluene	BDE-MXE	MS	1.0 – 5.0
PBFR-PAH	Wellington	Mixture	Toluene	BFR-PAR	Cal Std	0.2 – 4.0
S-21223	Accustandard	Mixture	isooctane	S-21223	CRS1	1.5 – 3.7
S-20375	Accustandard	Mixture	isooctane	S-20375	CRS1	3.0 – 5.0
S-20371	Accustandard	Mixture	isooctane	S-20371	CRS2	5.0 – 10.0
anti-DP	Wellington	Individual	Toluene	*anti*-DP	Cal, MS	50
syn-DP	Wellington	Individual	Toluene	*syn*-DP	Cal, MS	50
α-HBCD	Accustandard	Individual	Toluene	HXBCD-01	Cal, MS	100
EHTBB	Wellington	Individual	Toluene	EHTBB	Cal, MS	50
BEHTBP	Wellington	Individual	Toluene	BEHTBP	Cal, MS	50
pTBX	Wellington	Individual	Toluene	pTBX	Cal, MS	50
PBBZ	Wellington	Individual	Toluene	PBBZ	Cal, MS	50
BDE-118	Accustandard	Individual	isooctane	BDE-118S	IS	50
BDE-181	Wellington	Individual	nonane	BDE-181S	IS	50
BDE-209	Wellington	Individual			CRS2	50
DBDPE	Wellington	Individual			CRS2	25
BDE-77	Accustandard	Individual	isooctane	BDE-077S	SS	50
BDE-166	Accustandard	Individual	isooctane	BDE-166S	SS	50
$^{13}C_{12}$-BDE-209	Wellington	Individual	Toluene	MBDE-209	SS	25

Table 59. Table of PBDE/BFR compounds and their concentrations in stock mixtures BDE-MXE, BFR-PAH, S-21223, S-20375, and S20371 (µg/mL).

BDE-MXE		BFR-PAH				S-21223	
BDE-3	1.0	BDE-1	0.2	BDE-140	0.4	BDE-1	1.503
BDE-7	1.0	BDE-2	0.2	BDE-153	0.4	BDE-2	1.485
BDE-15	1.0	BDE-3	0.2	BDE-154	0.4	BDE-3	1.487
BDE-17	1.0	BDE-7	0.2	BDE-156	0.4	BDE-7	1.496
BDE-28	1.0	BDE-10	0.2	BDE-169	0.4	BDE-8	1.515
BDE-47	1.0	BDE-15	0.2	BB-153	0.4	BDE-10	1.524
BDE-49	1.0	BDE-17	0.192	BTBPE	0.4	BDE-11	1.485
BDE-66	1.0	BDE-28	0.2	BDE-171	0.8	BDE-12	1.501
BDE-71	1.0	BDE-30	0.2	BDE-180	0.8	BDE-13	1.514
BDE-77	1.0	HBB	0.2	BDE-183	0.8	BDE-15	1.501

BDE-85	1.0
BDE-99	1.0
BDE-100	1.0
BDE-119	1.0
BDE-126	1.0
BDE-138	2.0
BDE-153	2.0
BDE-154	2.0
BDE-156	2.0
BDE-183	2.0
BDE-184	2.0
BDE-191	2.0
BDE-196	2.0
BDE-197	2.0
BDE-206	5.0
BDE-207	5.0
BDE-209	5.0

PBEB	0.2	BDE-184	0.8
BDE-47	0.4	BDE-191	0.8
BDE-49	0.4	BDE-196	0.8
BDE-66	0.4	BDE-197	0.8
BDE-71	0.4	BDE-201	0.8
BDE-77	0.4	BDE-203	0.8
BDE-85	0.4	BDE-204	0.8
BDE-99	0.4	BDE-205	0.8
BDE-100	0.4	BDE-206	2.0
BDE-119	0.4	BDE-207	2.0
BDE-126	0.4	BDE-208	2.0
BDE-138	0.4	BDE-209	2.0
BDE-139	0.4	DBDPE	4.0

S-20375		**S-20371**	
BDE-140	3.003	BDE-209	5.0
BDE-197	3.940	DBDPE	10.0
BDE-202	4.024		
BDE-206	4.975		

BDE-181	3.696
BDE-183	3.789
BDE-190	3.702

BDE-17	1.528
BDE-25	1.509
BDE-28	1.518
BDE-30	1.489
BDE-32	1.516
BDE-33	1.499
BDE-35	1.508
BDE-37	1.504
BDE-47	1.504
BDE-49	1.506
BDE-66	1.531
BDE-71	1.514
BDE-75	1.503
BDE-77	1.503
BDE-85	2.237
BDE-99	2.251
BDE-100	2.264
BDE-116	2.274
BDE-119	2.292
BDE-126	2.240
BDE-138	3.033
BDE-153	3.019
BDE-154	3.012
BDE-155	3.022
BDE-166	2.958

Non-BDE Stock Standard

Instructions: Mix indicated aliquot volumes of individual standards (Table 58) as shown in Table 60 and dilute to 50 mL in hexane.

Table 60. Table of Non-BDE Stock Solution

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
anti-DP	50	0.5	50	500
syn-DP	50	0.5	50	500
α-HBCD	100	0.5	50	1,000
EHTBB	50	0.5	50	500
BEHTBP	50	0.5	50	500
pTBX	50	0.25	50	250
PBBZ	50	0.25	50	250

PBDE Internal Standard

Stock Mixture

Instructions: Mix indicated aliquot volumes of stock BDE-118 and BDE-181 standards as shown in Table 61 and dilute to 50 mL in hexane.

Table 61. Table of PBDE Internal Standard Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
BDE-118	50	0.5	50	500
BDE-181	50	1.0	50	1,000

Working Mixture

Instructions: Dilute 10 mL of stock PBDE Internal Standard Stock mixture (Tables 61) to 50 mL with hexane as shown in Table 62.

Table 62. Table of PBDE Internal Standard Working mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE IS Stock			***10***	***50***	
	BDE-118	500	10	50	100
	BDE-181	1,000	10	50	200

PBDE Surrogate Recovery Standard

Stock Mixture

Instructions: Mix indicated aliquot volumes of stock BDE-77, BDE-166 and $^{13}C_{12}$-BDE-209 as shown in Table 63 and dilute to 50 mL with hexane.

Table 63. Table of PBDE Surrogate Recovery Standard Stock mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
BDE-77	50	0.3	50	300
BDE-166	50	0.5	50	500
$^{13}C_{12}$-BDE-209	25	0.8	50	400

Working Mixture

Instructions: Dilute 10 mL of the PBDE Surrogate Recovery Standard Stock mixture (Table 63) in 50 mL of hexane as shown in Table 64.

Table 64. Table of PBDE Surrogate Recovery Standard Working mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE SS Stock			***10***	***50***	
	BDE-77	300	10	50	60
	BDE-166	500	10	50	100
	$^{13}C_{12}$-BDE-209	400	10	50	80

PBDE/BFR Calibration Standard

Working Mixture

Instructions: Mix the indicated aliquot volumes of Non-BDE stock (Table 60), BFR-PAR (Table 59), PBDE IS Stock (Table 61), and PBDE SS Stock (Tables 63) as shown in Table 65 and dilute to 100 mL with hexane.

Table 65. Table of working PBDE Calibration Standard mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Non-BDE Stock			***1.0***	***100***	
	anti-DP	500	1.0	100	5.0
	syn-DP	500	1.0	100	5.0
	α-HBCD	1,000	1.0	100	10.0
	EHTBB	500	1.0	100	5.0
	BEHTBP	500	1.0	100	5.0
	pTBX	250	1.0	100	2.5
	PBBZ	250	1.0	100	2.5
BFR-PAR			***1.0***	***100***	
	BDE-1	200	1.0	100	2.0
	BDE-2	200	1.0	100	2.0
	BDE-3	200	1.0	100	2.0
	BDE-7	200	1.0	100	2.0
	BDE-10	200	1.0	100	2.0
	BDE-15	200	1.0	100	2.0
	BDE-17	192	1.0	100	1.92
	BDE-28	200	1.0	100	2.0

	BDE-30	200	1.0	100	2.0
	HBB	200	1.0	100	2.0
	PBEB	200	1.0	100	2.0
	BDE-47	400	1.0	100	4.0
	BDE-49	400	1.0	100	4.0
	BDE-66	400	1.0	100	4.0
	BDE-71	400	1.0	100	4.0
	BDE-77	400	1.0	100	4.0
	BDE-85	400	1.0	100	4.0
	BDE-99	400	1.0	100	4.0
	BDE-100	400	1.0	100	4.0
	BDE-119	400	1.0	100	4.0
	BDE-126	400	1.0	100	4.0
	BDE-138	400	1.0	100	4.0
	BDE-139	400	1.0	100	4.0
	BDE-140	400	1.0	100	4.0
	BDE-153	400	1.0	100	4.0
	BDE-154	400	1.0	100	4.0
	BDE-156	400	1.0	100	4.0
	BDE-169	400	1.0	100	4.0
	BB-153	400	1.0	100	4.0
	BTBPE	400	1.0	100	4.0
	BDE-171	800	1.0	100	8.0
	BDE-180	800	1.0	100	8.0
	BDE-183	800	1.0	100	8.0
	BDE-184	800	1.0	100	8.0
	BDE-191	800	1.0	100	8.0
	BDE-196	800	1.0	100	8.0
	BDE-197	800	1.0	100	8.0
	BDE-201	800	1.0	100	8.0
	BDE-203	800	1.0	100	8.0
	BDE-204	800	1.0	100	8.0
	BDE-205	800	1.0	100	8.0
	BDE-206	2,000	1.0	100	20.0
	BDE-207	2,000	1.0	100	20.0
	BDE-208	2,000	1.0	100	20.0
	BDE-209	2,000	1.0	100	20.0
	DBDPE	4,000	1.0	100	40.0
PBDE IS Stock			***1.0***	***100***	
	BDE-118	500	1.0	100	5.0
	BDE-181	1,000	1.0	100	10.0
PBDE SS Stock			***1.0***	***100***	
	BDE-77	300	1.0	100	3.0
	BDE-166	500	1.0	100	5.0
	$^{13}C_{12}$-BDE-209	400	1.0	100	4.0

Table 66. PBDE concentrations for compounds of the IADN annual reporting list in the PBDE Calibration Standard.

Compound	Conc., ng/mL	Compound	Conc., ng/mL
BDE-15	2.0	BDE-208	20.0
BDE-17	1.92	BDE-209	20.0
BDE-28	2.0	pTBX	2.5
BDE-47	4.0	PBBZ	2.5
BDE-49	4.0	PBEB	2.0
BDE-66	4.0	HBB	2.0
BDE-85	4.0	EHTBB	5.0
BDE-99	4.0	HBCD	10.0
BDE-100	4.0	TBE	4.0
BDE-139	4.0	BEHTBP	5.0
BDE-140	4.0	syn-DP	5.0
BDE-153	4.0	anti-DP	5.0
BDE-154+BB-153	8.0	DBDPE	40.0
BDE-183	8.0		
BDE-197	8.0	BDE-77	7.0
BDE-201	8.0	BDE-166	5.0
BDE-203	8.0	$^{13}C_{12}$-BDE-209	4.0
BDE-206	20.0	BDE-118	5.0
BDE-207	20.0	BDE-181	10.0

PBDE Common Reference Standards

Stock Mixtures

Instructions: Two separate stocks are prepared to check the PBDE calibration.

PBDE CRS1 Stock: Mix 1.0 mL aliquots of S-21223 and S-20375 (Table 59) as shown in Table 67 and dilute to 10 mL with hexane.

PBDE CRS2 Stock: Combine aliquots of PBDE IS Stock (Table 61), PBDE SS Stock (Table 63), and selected individual PBDE compounds (Table 58) as shown in Table 68 and dilute to 25 mL with hexane.

Table 67. Table of PBDE CRS1 Stock.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
S-20375			***1.0***	***10.0***	
	BDE-140	3,003	1.0	10.0	300
	BDE-197	3,940	1.0	10.0	394
	BDE-202	4,024	1.0	10.0	402
	BDE-206	4,975	1.0	10.0	498
S-21223			***1.0***	***10.0***	
	BDE-1	1,503	1.0	10.0	150
	BDE-2	1,485	1.0	10.0	149
	BDE-3	1,487	1.0	10.0	149
	BDE-7	1,496	1.0	10.0	150
	BDE-8	1,515	1.0	10.0	152

	BDE-10	1,524	1.0	10.0	152
	BDE-11	1,485	1.0	10.0	149
	BDE-12	1,501	1.0	10.0	150
	BDE-13	1,514	1.0	10.0	151
	BDE-15	1,501	1.0	10.0	150
	BDE-17	1,528	1.0	10.0	153
	BDE-25	1,509	1.0	10.0	151
	BDE-28	1,518	1.0	10.0	152
	BDE-30	1,489	1.0	10.0	149
	BDE-32	1,516	1.0	10.0	152
	BDE-33	1,499	1.0	10.0	150
	BDE-35	1,508	1.0	10.0	151
	BDE-37	1,504	1.0	10.0	150
	BDE-47	1,504	1.0	10.0	150
	BDE-49	1,506	1.0	10.0	151
	BDE-66	1,531	1.0	10.0	153
	BDE-71	1,514	1.0	10.0	151
	BDE-75	1,503	1.0	10.0	150
	BDE-77	1,503	1.0	10.0	150
	BDE-85	2,237	1.0	10.0	224
	BDE-99	2,251	1.0	10.0	225
	BDE-100	2,264	1.0	10.0	226
	BDE-116	2,274	1.0	10.0	227
	BDE-119	2,292	1.0	10.0	229
	BDE-126	2,240	1.0	10.0	224
	BDE-138	3,033	1.0	10.0	303
	BDE-153	3,019	1.0	10.0	302
	BDE-154	3,012	1.0	10.0	301
	BDE-155	3,022	1.0	10.0	302
	BDE-166	2,958	1.0	10.0	296
	BDE-181	3,696	1.0	10.0	370
	BDE-183	3,789	1.0	10.0	379
	BDE-190	3,702	1.0	10.0	370

Table 68. Table of PBDE CRS2 Stock mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE IS Stock			***2.5***	***25***	
	BDE-118	500	2.5	25	50
	BDE-181	1,000	2.5	25	100
PBDE SS Stock			***2.5***	***25***	
	BDE-77	300	2.5	25	30
	BDE-166	500	2.5	25	50
	$^{13}C_{12}$-BDE-209	400	2.5	25	40
Individual Stocks					
	BDE-209	50,000	0.1	25	200
	DBDPE	25,000	0.4	25	400

Working Mixtures

Instructions: Two working mixtures are prepared from the two PBDE CRS Stocks.

PBDE CRS1 Working: Combine aliquots of the PBDE CRS1 Stock (Table 67), Non-BDE Stock (Table 60), PBDE IS Stock (Table 61), and PBDE SS Stock (Table 63) as shown in Table 69 and dilute to 100 mL with hexane.

PBDE CRS2 Working: Dilute the PBDE CRS2 Stock ten-fold as shown in Table 70.

Table 69. Table of PBDE CRS1 working mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE IS Stock			***1.0***	***100***	
	BDE-118	500	1.0	100	5.0
	BDE-181	1,000	1.0	100	10.0
PBDE SS Stock			***1.0***	***100***	
	BDE-77	300	1.0	100	3.0
	BDE-166	500	1.0	100	5.0
	$^{13}C_{12}$-BDE-209	400	1.0	100	4.0
Non-BDE Stock			***1.0***	***100***	
	anti-DP	500	1.0	100	5.0
	syn-DP	500	1.0	100	5.0
	α-HBCD	1,000	1.0	100	10.0
	EHTBB	500	1.0	100	5.0
	BEHTBP	500	1.0	100	5.0
	pTBX	250	1.0	100	2.5
	PBBZ	250	1.0	100	2.5
PBDE CRS1 Stock			***1.0***	***100***	
	BDE-1	150	1.0	100	1.5
	BDE-2	149	1.0	100	1.5
	BDE-3	149	1.0	100	1.5
	BDE-7	150	1.0	100	1.5
	BDE-8	152	1.0	100	1.5
	BDE-10	152	1.0	100	1.5
	BDE-11	149	1.0	100	1.5
	BDE-12	150	1.0	100	1.5
	BDE-13	151	1.0	100	1.5
	BDE-15	150	1.0	100	1.5
	BDE-17	153	1.0	100	1.5
	BDE-25	151	1.0	100	1.5
	BDE-28	152	1.0	100	1.5
	BDE-30	149	1.0	100	1.5
	BDE-32	152	1.0	100	1.5
	BDE-33	150	1.0	100	1.5
	BDE-35	151	1.0	100	1.5
	BDE-37	150	1.0	100	1.5
	BDE-47	150	1.0	100	1.5
	BDE-49	151	1.0	100	1.5
	BDE-66	153	1.0	100	1.5
	BDE-71	151	1.0	100	1.5
	BDE-75	150	1.0	100	1.5
	BDE-77	150	1.0	100	1.5
	BDE-85	224	1.0	100	2.2
	BDE-99	225	1.0	100	2.3

	BDE-100	226	1.0	100	2.3
	BDE-116	227	1.0	100	2.3
	BDE-119	229	1.0	100	2.3
	BDE-126	224	1.0	100	2.2
	BDE-138	303	1.0	100	3.0
	BDE-140	300	1.0	100	3.0
	BDE-153	302	1.0	100	3.0
	BDE-154	301	1.0	100	3.0
	BDE-155	302	1.0	100	3.0
	BDE-166	296	1.0	100	3.0
	BDE-181	370	1.0	100	3.7
	BDE-183	379	1.0	100	3.8
	BDE-190	370	1.0	100	3.7
	BDE-197	394	1.0	100	3.9
	BDE-202	402	1.0	100	4.0
	BDE-206	498	1.0	100	5.0

Table 70. Table of the PBDE CRS2 Working mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE CRS2 Stock			***1.0***	***10***	
	BDE-118	50	1.0	10	5.0
	BDE-181	100	1.0	10	10.0
	BDE-77	30	1.0	10	3.0
	BDE-166	50	1.0	10	5.0
	$^{13}C_{12}$-BDE-209	40	1.0	10	4.0
	BDE-209	200	1.0	10	20.0
	DBDPE	400	1.0	10	40.0

Table 71. Table of individual BFRs and their concentrations (ng/mL) from the annual IADN reporting list in the PBDE CRS1 and CRS2 working mixtures.

PBDE CRS1 Working			
BDE-15	1.5	BDE-85	2.2
pTBX	2.5	BDE-154	3.0
PBBZ	2.5	BDE-153	3.0
BDE-17	3.0	HBCD	10.0
BDE-28	3.0	BDE-140	3.0
BDE-49	1.5	BDE-166	8.0
BDE-47	1.5	BDE-183	3.8
BDE-66	1.5	BDE-181	13.7
BDE-77	4.5	BEHTBP	5.0
BDE-100	2.3	syn-DP	5.0
BDE-99	2.3	BDE-197	3.9
EHTBB	5.0	anti-DP	5.0
BDE-118	5.0	BDE-206	5.0

PBDE CRS2 Working	
BDE-77	3.0
BDE-118	5.0
BDE-166	5.0
BDE-181	10.0
$^{13}C_{12}$-BDE-209	4.0
BDE-209	20.0
DBDPE	40.0

Note: BDE-17 and BDE-28 have concentrations greater than their actual stock concentrations due to co-elutions with non-target BDE compounds.

PBDE Matrix Spike

Working Mixtures

Instructions: Two PBDE matrix spike mixtures are prepared.

PBDE MS Mix A: Combine indicated aliquots of the non-BDE stock (Table 60) and BDE-MXE (Table 59) mixtures as shown in Table 72 then dilute to 25 mL with hexane.

PBDE MS Mix B: Combine indicated aliquots of selected individual PBDE standards (Table 58) as shown in Table 73, then dilute to 25 mL.

Table 72. Table of the PBDE Matrix Spike Mix A working mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Non-BDE Stock			***2.5***	***25***	
	anti-DP	500	2.5	25	50
	syn-DP	500	2.5	25	50
	α-HBCD	1,000	2.5	25	100
	EHTBB	500	2.5	25	50
	BEHTBP	500	2.5	25	50
	pTBX	250	2.5	25	25
	PBBZ	250	2.5	25	25
BDE-MXE			***1.0***	***100***	
	BDE-3	1,000	1.0	25	40
	BDE-7	1,000	1.0	25	40
	BDE-15	1,000	1.0	25	40
	BDE-17	1,000	1.0	25	40
	BDE-28	1,000	1.0	25	40
	BDE-47	1,000	1.0	25	40
	BDE-49	1,000	1.0	25	40
	BDE-66	1,000	1.0	25	40
	BDE-71	1,000	1.0	25	40
	BDE-77	1,000	1.0	25	40
	BDE-85	1,000	1.0	25	40
	BDE-99	1,000	1.0	25	40
	BDE-100	1,000	1.0	25	40
	BDE-119	1,000	1.0	25	40
	BDE-126	1,000	1.0	25	40
	BDE-138	2,000	1.0	25	80
	BDE-153	2,000	1.0	25	80
	BDE-154	2,000	1.0	25	80
	BDE-156	2,000	1.0	25	80
	BDE-183	2,000	1.0	25	80

	BDE-184	2,000	1.0	25	80
	BDE-191	2,000	1.0	25	80
	BDE-196	2,000	1.0	25	80
	BDE-197	2,000	1.0	25	80
	BDE-206	5,000	1.0	25	200
	BDE-207	5,000	1.0	25	200
	BDE-209	5,000	1.0	25	200

Table 73. Table of the PBDE Matrix Spike Mix B working mixture.

Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBEB	5,000	0.25	25	50
HBB	5,000	0.25	25	50
TBE	5,000	0.5	25	100
DBDPE	5,000	2.0	25	400

PBDE Linearity Standard

PBDE Linearity High Stock

Instructions: Mix indicated aliquot volumes of Non-BDE stock (Tables 60), BFR-PAR (Tables 59), and the PBDE SS Stock mix (Table 63) as shown in Table 74 and dilute to 4 mL in hexane.

Table 74. Table of the PBDE Linearity High Stock mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
Non-BDE Stock			***0.8***	***4.0***	
	anti-DP	500	0.8	4.0	100
	syn-DP	500	0.8	4.0	100
	α-HBCD	1,000	0.8	4.0	200
	EHTBB	500	0.8	4.0	100
	BEHTBP	500	0.8	4.0	100
	pTBX	250	0.8	4.0	50
	PBBZ	250	0.8	4.0	50
BFR-PAR			***1.0***	***4.0***	
	BDE-1	200	1.0	4.0	50
	BDE-2	200	1.0	4.0	50
	BDE-3	200	1.0	4.0	50
	BDE-7	200	1.0	4.0	50
	BDE-10	200	1.0	4.0	50
	BDE-15	200	1.0	4.0	50
	BDE-17	192	1.0	4.0	48
	BDE-28	200	1.0	4.0	50
	BDE-30	200	1.0	4.0	50
	HBB	200	1.0	4.0	50
	PBEB	200	1.0	4.0	50
	BDE-47	400	1.0	4.0	100
	BDE-49	400	1.0	4.0	100

	BDE-66	400	1.0	4.0	100
	BDE-71	400	1.0	4.0	100
	BDE-77	400	1.0	4.0	100
	BDE-85	400	1.0	4.0	100
	BDE-99	400	1.0	4.0	100
	BDE-100	400	1.0	4.0	100
	BDE-119	400	1.0	4.0	100
	BDE-126	400	1.0	4.0	100
	BDE-138	400	1.0	4.0	100
	BDE-139	400	1.0	4.0	100
	BDE-140	400	1.0	4.0	100
	BDE-153	400	1.0	4.0	100
	BDE-154	400	1.0	4.0	100
	BDE-156	400	1.0	4.0	100
	BDE-169	400	1.0	4.0	100
	BB-153	400	1.0	4.0	100
	BTBPE	400	1.0	4.0	100
	BDE-171	800	1.0	4.0	200
	BDE-180	800	1.0	4.0	200
	BDE-183	800	1.0	4.0	200
	BDE-184	800	1.0	4.0	200
	BDE-191	800	1.0	4.0	200
	BDE-196	800	1.0	4.0	200
	BDE-197	800	1.0	4.0	200
	BDE-201	800	1.0	4.0	200
	BDE-203	800	1.0	4.0	200
	BDE-204	800	1.0	4.0	200
	BDE-205	800	1.0	4.0	200
	BDE-206	2,000	1.0	4.0	500
	BDE-207	2,000	1.0	4.0	500
	BDE-208	2,000	1.0	4.0	500
	BDE-209	2,000	1.0	4.0	500
	DBDPE	4,000	1.0	4.0	1,000
PBDE SS Stock			***0.25***	***4.0***	
	BDE-77	300	0.25	4.0	18.75
	BDE-166	500	0.25	4.0	31.25
	$^{13}C_{12}$-BDE-209	400	0.25	4.0	25.0

Working Mixtures

Instructions: Perform dilution of the PBDE Linearity High Stock (Table 74) as shown in Table 75. Each dilution is done separately.

Table 75. Table of the various PBDE linearity levels.

Level	Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
01	PBDE Lin High	25-1000			25-1000
02	PBDE Lin High	25-1000	0.8	1.0	20-800
03	PBDE Lin High	25-1000	0.6	1.0	15-600
04	PBDE Lin High	25-1000	0.4	1.0	10-400

05	PBDE Lin High	25-1000	0.2	1.0	5-200
06	PBDE Lin High	25-1000	0.1	1.0	2.5-100
07	PBDE Lin 06	2.5-100	0.5	1.0	1.25-50
08	PBDE Lin 07	1.25-50	0.5	1.0	0.6-25
09	PBDE Lin 08	0.6-25	0.5	1.0	0.3-12.5
10	PBDE Lin 09	0.3-12.5	0.5	1.0	0.2-6.25
11	PBDE Lin 10	0.2-6.25	0.5	1.0	0.1-3.1
12	PBDE Lin 11	0.1-3.1	0.5	1.0	0.04-1.6
13	PBDE Lin 12	0.04-1.6	0.5	1.0	0.02-0.8
14	PBDE Lin 13	0.02-0.8	0.5	1.0	0.01-0.4

Table 76. Table of individual compound concentrations in the various PBDE Linearity levels.

BFRs	Concentration (ng/mL) per Level													
	01	02	03	04	05	06	07	08	09	10	11	12	13	14
BDE-15	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
pTBX	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
PBBZ	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
BDE-17	48	38	29	19	10	4.8	2.4	1.20	0.60	0.30	0.150	0.075	0.038	0.019
BDE-28	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
PBEB	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
HBB	50	40	30	20	10	5.0	2.5	1.25	0.63	0.31	0.156	0.078	0.039	0.020
BDE-49	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-47	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-66	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-77	119	95	71	48	24	11.9	5.9	2.97	1.48	0.74	0.371	0.186	0.093	0.046
BDE-100	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-99	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
EHTBB	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-85	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-154	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
BDE-153	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039

BDE-139	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
HBCD	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
BDE-140	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-166	31	25	19	13	6	3.1	1.6	0.78	0.39	0.20	0.098	0.049	0.024	0.012
BDE-183	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
TBE	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BEHTBP	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
syn-DP	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-201	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
BDE-197	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
anti-DP	100	80	60	40	20	10.0	5.0	2.50	1.25	0.63	0.313	0.156	0.078	0.039
BDE-203	200	160	120	80	40	20.0	10.0	5.00	2.50	1.25	0.625	0.313	0.156	0.078
BDE-208	500	400	300	200	100	50.0	25.0	12.50	6.25	3.13	1.563	0.781	0.391	0.195
BDE-207	500	400	300	200	100	50.0	25.0	12.50	6.25	3.13	1.563	0.781	0.391	0.195
BDE-206	500	400	300	200	100	50.0	25.0	12.50	6.25	3.13	1.563	0.781	0.391	0.195
13C12-BDE-209	25	20	15	10	5	2.5	1.3	0.63	0.31	0.16	0.078	0.039	0.020	0.010
BDE-209	500	400	300	200	100	50.0	25.0	12.50	6.25	3.13	1.563	0.781	0.391	0.195
DBDPE	1000	800	600	400	200	100.0	50.0	25.00	12.50	6.25	3.125	1.563	0.781	0.391

PBDE Instrument Detection Limit

Stock Mixture

Instructions: Dilute 50 µL of the PBDE High Linearity stock (Table 74) to 4.0 mL with hexane as shown in Table 77.

Table 77. Table of the PBDE IDL Stock Mixture.

Stock	Compound	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final conc., ng/mL
PBDE High Linearity Stock			***0.05***	***4.0***	
	anti-DP	100	0.05	4.0	1.25
	syn-DP	100	0.05	4.0	1.25
	α-HBCD	200	0.05	4.0	2.50

	EHTBB	100	0.05	4.0	1.25
	BEHTBP	100	0.05	4.0	1.25
	pTBX	50	0.05	4.0	0.63
	PBBZ	50	0.05	4.0	0.63
	BDE-1	50	0.05	4.0	0.63
	BDE-2	50	0.05	4.0	0.63
	BDE-3	50	0.05	4.0	0.63
	BDE-7	50	0.05	4.0	0.63
	BDE-10	50	0.05	4.0	0.63
	BDE-15	50	0.05	4.0	0.63
	BDE-17	48	0.05	4.0	0.60
	BDE-28	50	0.05	4.0	0.63
	BDE-30	50	0.05	4.0	0.63
	HBB	50	0.05	4.0	0.63
	PBEB	50	0.05	4.0	0.63
	BDE-47	100	0.05	4.0	1.25
	BDE-49	100	0.05	4.0	1.25
	BDE-66	100	0.05	4.0	1.25
	BDE-71	100	0.05	4.0	1.25
	BDE-85	100	0.05	4.0	1.25
	BDE-99	100	0.05	4.0	1.25
	BDE-100	100	0.05	4.0	1.25
	BDE-119	100	0.05	4.0	1.25
	BDE-126	100	0.05	4.0	1.25
	BDE-138	100	0.05	4.0	1.25
	BDE-139	100	0.05	4.0	1.25
	BDE-140	100	0.05	4.0	1.25
	BDE-153	100	0.05	4.0	1.25
	BDE-154	100	0.05	4.0	1.25
	BDE-156	100	0.05	4.0	1.25
	BDE-169	100	0.05	4.0	1.25
	BB-153	100	0.05	4.0	1.25
	BTBPE	100	0.05	4.0	1.25
	BDE-171	200	0.05	4.0	2.50
	BDE-180	200	0.05	4.0	2.50
	BDE-183	200	0.05	4.0	2.50
	BDE-184	200	0.05	4.0	2.50
	BDE-191	200	0.05	4.0	2.50
	BDE-196	200	0.05	4.0	2.50
	BDE-197	200	0.05	4.0	2.50
	BDE-201	200	0.05	4.0	2.50
	BDE-203	200	0.05	4.0	2.50
	BDE-204	200	0.05	4.0	2.50
	BDE-205	200	0.05	4.0	2.50
	BDE-206	500	0.05	4.0	6.25
	BDE-207	500	0.05	4.0	6.25
	BDE-208	500	0.05	4.0	6.25
	BDE-209	500	0.05	4.0	6.25

	DBDPE	1,000	0.05	4.0	12.50
	BDE-77	119	0.05	4.0	1.49
	BDE-166	31.25	0.05	4.0	0.39
	$^{13}C_{12}$-BDE-209	25.0	0.05	4.0	0.31

Working Mixture

Instructions: Combine aliquots of PBDE IDL Stock mixture (Table 77) and PBDE IS working mixtures as shown in Table 78.

Table 78. Table of the PBDE IDL working mixture.

Stock	Stock conc., ng/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
PBDE IDL Stock	0.31 – 12.5	0.2	1.0	0.06 - 2.5
PBDE Lin High	100 – 200	0.05	1.0	5.0 – 10.0

Note: Occasionally multiple levels will need to be prepared to more accurately assess particular compounds given that this mixture has compounds over a range of concentrations.

Table 79. Table of individual compound concentrations (ng/mL) from the IADN annual PBDE reporting list in the PBDE IDL working mixture.

Compound	Conc.	Compound	Conc.
BDE-15	0.125	HBCD	0.500
pTBX	0.125	BDE-140	0.250
PBBZ	0.125	BDE-166	0.078
BDE-17	0.125	BDE-183	0.500
BDE-28	0.125	TBE	0.250
PBEB	0.125	BDE-181	10.0
HBB	0.125	BEHTBP	0.250
BDE-49	0.250	syn-DP	0.250
BDE-47	0.250	BDE-201	0.500
BDE-66	0.250	BDE-197	0.500
BDE-77	0.297	anti-DP	0.250
BDE-100	0.250	BDE-203	0.500
BDE-99	0.250	BDE-208	1.250
EHTBB	0.250	BDE-207	1.250
BDE-118	5.0	BDE-206	1.250
BDE-85	0.250	$^{13}C_{12}$-BDE-209	0.063
BDE-154	0.500	BDE-209	1.250
BDE-153	0.250	DBDPE	2.500
BDE-139	0.250		

MATRIX SPIKE VIALS

Instructions: Mix indicated volumes of the working Matrix Spike Recovery standards for PCBs (see Tables 15), Pesticides (see Tables 32), PAHs (see Tables 51), PBDEs (see Tables 76), OPEs, and β-HCH (see Tables 22) in a 4 mL amber vial as shown in Table 82. The MS vials are used for matrix spike experiments.

Table 80. Table of MS vials.

Working Standard	Conc., ng/mL	Aliquot, mL	Final Mass, ng
PCB MS Recovery Standard	90.5	1.0	90.5
Pesticide MS Recovery Standard	100	0.2	20
PAH MS Recovery Standard	2,000	0.2	400
PBDE MS Recovery Standard A	25-200	0.1	2.5-20
PBDE MS Recovery Standard B	50-400	0.05	2.5-20
OPE MS Recovery Standard	2-5	0.2	0.4-1
β-HCH Standard	200	0.1	20

PFAS STANDARDS

The following sections list PFAS standards, including the stock solutions and working solutions for calibration, common reference, surrogate, internal, matrix spike, linearity and instrument detection limit (IDL) standards used in the IADN Project. **Due to possible sorption of PFAS to glassware, all the PFAS solutions should be prepared and stored in polypropylene plasticware.**

Stock Solutions

Table 81. Table of PFAS individual stock standards and their concentrations.

Group	Abbr.	Vendor	Conc., µg/mL
PFCAs			
	PFBA	Wellington	50
	PFPeA	Wellington	50
	PFHxA	Wellington	50
	PFHpA	Wellington	50
	PFOA	Wellington	50
	PFNA	Wellington	50
	PFDA	Wellington	50
	PFUnDA	Wellington	50
	PFDoDA	Wellington	50
	PFTrDA	Wellington	50
	PFTeDA	Wellington	50
	PFHxDA	Wellington	50
PFSAs			
	PFPrS	Wellington	50
	PFBS	Wellington	50
	PFPeS	Wellington	50

	PFHxS	Wellington	50
	PFHpS	Wellington	50
	PFOS	Wellington	50
	PFNS	Wellington	50
	PFDS	Wellington	50
FASAs			
	FBSA	Wellington	50
FTSAs			
	4:2 FTSA	Wellington	50
	6:2 FTSA	Wellington	50
	8:2 FTSA	Wellington	50
Internal Standards			
	MPFBA	Wellington	50
	M8PFOA	Wellington	50
	M7PFUnDA	Wellington	50
	M3PFHxS	Wellington	50
	M8PFOS	Wellington	50
Surrogate Recovery Standards			
	M3PFBA	Wellington	50
	MPFHxA	Wellington	50
	MPFOA	Wellington	50
	MPFUnDA	Wellington	50
	M2PFTeDA	Wellington	50
	M3PFBS	Wellington	50
	MPFHxS	Wellington	50
	MPFOS	Wellington	50
	M2-8:2 FTSA	Wellington	50
PFAS CRS Mixture			
	PFCA30PAR	Wellington	1.0

PFAS Intermediate Stock Solutions

Instructions: Dilute the indicated volume of selected individual PFAS standard(s) to 10 mL in LC/MS methanol in a polypropylene volumetric flask as shown in Tables 82-88.

Table 82. Table of ionic PFAS MIX A intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
PFBA	50	1.0	10	5.0
PFPeA	50	1.0	10	5.0
PFHxA	50	1.0	10	5.0
PFHpA	50	1.0	10	5.0
PFOA	50	1.0	10	5.0
PFNA	50	1.0	10	5.0

Table 83. Table of ionic PFAS MIX B intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
PFDA	50	1.0	10	5.0
PFUnDA	50	1.0	10	5.0
PFDoDA	50	1.0	10	5.0
PFTrDA	50	1.0	10	5.0
PFTeDA	50	1.0	10	5.0
PFHxDA	50	1.0	10	5.0

Table 84. Table of ionic PFAS MIX C intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
PFPrS	50	1.0	10	5.0
PFBS	50	1.0	10	5.0
PFPeS	50	1.0	10	5.0
PFHxS	50	1.0	10	5.0
PFHpS	50	1.0	10	5.0
PFOS	50	1.0	10	5.0
PFNS	50	1.0	10	5.0
PFDS	50	1.0	10	5.0

Table 85. Table of ionic PFAS MIX D intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
4:2 FTSA	50	1.0	10	5.0
6:2 FTSA	50	1.0	10	5.0
8:2 FTSA	50	1.0	10	5.0
FBSA	50	1.0	10	5.0

Table 86. Table of ionic PFAS LC SS Mix 1 intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
M3PFBA	50	1.0	25	2.0
MPFHxA	50	1.0	25	2.0
MPFOA	50	1.0	25	2.0
MPFUdA	50	1.0	25	2.0
M2PFTeDA	50	1.0	25	2.0
M3PFBS	50	1.0	25	2.0
MPFHxS	50	1.0	25	2.0
MPFOS	50	1.0	25	2.0
M2-8:2 FTSA	50	1.0	25	2.0

Table 87. Table of ionic PFAS LC IS Mix intermediate stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
MPFBA	50	1.0	50	1.0
M8PFOA	50	1.0	50	1.0
M7PFUdA	50	1.0	50	1.0
M3PFHxS	50	1.0	50	1.0
M8PFOS	50	1.0	50	1.0

Table 88. Table of ionic PFAS CRS Stock solution.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
PFCA30PAR	1.0	1.0	10	0.1

PFAS Mixture Solutions.

Instructions: Mix/Dilute the indicated volume of selected individual PFAS standard(s) to 10 mL in LC/MS methanol in a polypropylene volumetric flask as shown in Table 89.

Table 89. Table of the IADN iPFAS LC Mix 1 Stock.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
iPFAS Mix A	5.0	1.0	10	0.5
iPFAS Mix B	5.0	1.0	10	0.5
iPFAS Mix C	5.0	1.0	10	0.5
iPFAS Mix D	5.0	1.0	10	0.5

PFAS Internal Standard

Instructions: Mix/Dilute the indicated volume of selected individual PFAS standard(s) to 10 mL in LC/MS methanol in a polypropylene volumetric flask as shown in Table 90.

Table 90. Table of the working PFAS internal standard mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., µg/mL
iPFAS LC IS Mix	1.0	1.0	10	0.1

Table 91. Concentration for individual PFAS in the working PFAS internal standard mixture.

Compound	Stock conc., ng/mL	Spike Vol., µL	Spike Mass, ng
MPFBA	100	50	5.0
M8PFOA	100	50	5.0
M7PFUnDA	100	50	5.0
M3PFHxS	100	50	5.0
M8PFOS	100	50	5.0

PFAS Surrogate Recovery Standards

Instructions: Mix/Dilute the indicated volume of selected individual PFAS standard(s) to 10 mL in LC/MS methanol in a polypropylene volumetric flask as shown in Table 92.

Table 92. Table of the working PFAS surrogate standard mixture.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
iPFAS LC SS	2.0	0.2	10	40

Table 93. Concentrations for individual PFAS in working iPFAS SS mixture.

Compound	Stock conc., ng/mL	Spike Vol., µL	Spike Mass, ng
M3PFBA	40	50	2.0
MPFHxA	40	50	2.0
MPFOA	40	50	2.0
MPFUnDA	40	50	2.0
M2PFTeDA	40	50	2.0
M3PFBS	40	50	2.0
MPFHxS	40	50	2.0
MPFOS	40	50	2.0
M2-8:2FTSA	40	50	2.0

PFAS Matrix Spike Recovery Standard

Instructions: Mix/Dilute the indicated volume of selected individual PFAS standard(s) to 10mL in LC/MS grade methanol in a polypropylene volumetric flask as shown in Table 94.

Table 94. Table of the working PFAS matrix spike recovery standard.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
iPFAS LC Mix 1	0.5	2.0	10	100

Table 95. Concentration for individual PFAS in the working matrix spike recovery standard.

Compound	Stock conc., ng/mL	Spike Vol., µL	Spike Mass, ng
PFBA	100	50	5.0
PFPeA	100	50	5.0
PFHxA	100	50	5.0
PFHpA	100	50	5.0
PFOA	100	50	5.0
PFNA	100	50	5.0
PFDA	100	50	5.0
PFUnDA	100	50	5.0
PFDoDA	100	50	5.0
PFTrDA	100	50	5.0
PFTeDA	100	50	5.0
PFHxDA	100	50	5.0

PFPrS	100	50	5.0
PFBS	100	50	5.0
PFPeS	100	50	5.0
PFHxS	100	50	5.0
PFHpS	100	50	5.0
PFOS	100	50	5.0
PFNS	100	50	5.0
PFDS	100	50	5.0
FBSA	100	50	5.0
4:2 FTSA	100	50	5.0
6:2 FTSA	100	50	5.0
8:2 FTSA	100	50	5.0

PFAS Common Calibration Standard

Instructions: First, mix the indicated aliquot volumes of selected PFAS mixture solutions together and dilute with LC/MS methanol in 25 mL volumetric flask as shown in Table 96 to make the solution for the preparation of low level (1-4) calibration. Mix indicated aliquot volumes of selected PFAS mixture solutions (Tables 89, 90 and 92) together and dilute with LC/MS methanol in 10 mL volumetric flask as shown in Table 97. Concentrations of individual PFAS compounds in each calibration standard solution are listed in Table 98.

Table 96. Table of mixture solution for the preparation of low level (1-4) calibration.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
iPFAS LC Mix 1	0.50	0.125	25	250
iPFAS LC Work SS	0.04	0.250	25	0.4

Table 97. Table of PFAS common calibration standard levels.

Stock solution	Spike Amounts (mL) per Calibration Level							
	01	02	03	04	05	06	07	08
iPFAS Low Cal Mix	0.4	1.0	2.0	4.0				
iPFAS LC IS Work (100 ng/mL)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
iPFA LC Mix 1 & 2 (500 ng/mL)					0.05	0.1	0.2	0.5
iPFAS LC SS Work (40 ng/mL)					0.1	0.2	0.5	1.0
Total Volume	10	10	10	10	10	10	10	10

Table 98. Concentration (ng/mL) for individual PFAS compounds in iPFAS IADN common calibration standards.

iPFAS Compound	Compound Concentration (ng/mL) per Calibration Level							
	01	02	03	04	05	06	07	08
PFBA	0.1	0.25	0.5	1.0	2.5	5	10	25

PFPeA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFHxA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFHpA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFOA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFNA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFUnDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFDoDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFTrDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFTeDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFHxDA	0.1	0.25	0.5	1.0	2.5	5	10	25
PFPrS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFBS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFPeS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFHxS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFHpS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFOS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFNS	0.1	0.25	0.5	1.0	2.5	5	10	25
PFDS	0.1	0.25	0.5	1.0	2.5	5	10	25
FBSA	0.1	0.25	0.5	1.0	2.5	5	10	25
4:2 FTSA	0.1	0.25	0.5	1.0	2.5	5	10	25
6:2 FTSA	0.1	0.25	0.5	1.0	2.5	5	10	25
8:2 FTSA	0.1	0.25	0.5	1.0	2.5	5	10	25
M3PFBA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFHxA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFOA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFUnDA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
M2PFTeDA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
M3PFBS (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFHxS (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFOS (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
M2-8:2 FTSA (SS)	0.016	0.04	0.08	0.16	0.4	0.8	2	4
MPFBA (IS)	5	5	5	5	5	5	5	5
M8PFOA (IS)	5	5	5	5	5	5	5	5
M7PFUnDA (IS)	5	5	5	5	5	5	5	5
M3PFHxS (IS)	5	5	5	5	5	5	5	5
M8PFOS (IS)	5	5	5	5	5	5	5	5

PFAS Common Reference Standard (CRS)

Instructions: Mix indicated aliquot volumes of selected PFAS mixture solutions (see Tables 88, 90 and 92) together and dilute with LC/MS methanol in 10 mL volumetric flask as shown in Tables 99 & 100. Concentrations of individual PFAS compounds in each calibration standard solution are listed in Table 101.

Table 99. Table of iPFAS High CRS.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
iPFAS CRS Stock	0.1	0.5	10	5.0
iPFAS LC SS Work	0.04	1.0	10	4.0
iPFAS LC IS Work	0.1	0.5	10	5.0

Table 100. Table of iPFAS Low CRS.

Stock	Stock conc., µg/mL	Aliquot, mL	Final Vol., mL	Final Conc., ng/mL
iPFAS CRS Stock	0.1	0.05	10	0.5
iPFAS LC SS Work	0.04	0.1	10	0.4
iPFAS LC IS Work	0.1	0.5	10	5.0

Table 101. Concentrations (ng/mL) for individual PFAS compounds in two iPFAS IADN common reference standards (iPFAS low CRS and iPFAS high CRS).

Compound	iPFAS CRS Low (ng/mL)	iPFAS CRS High (ng/mL)
PFBA	0.5	5.0
PFPeA	0.5	5.0
PFHxA	0.5	5.0
PFHpA	0.5	5.0
PFOA	0.5	5.0
PFNA	0.5	5.0
PFDA	0.5	5.0
PFUnDA	0.5	5.0
PFDoDA	0.5	5.0
PFTrDA	0.5	5.0
PFTeDA	0.5	5.0
PFBS	0.5	5.0
PFPeS	0.5	5.0
PFHxS	0.5	5.0
PFHpS	0.5	5.0
PFOS	0.5	5.0
PFNS	0.5	5.0
PFDS	0.5	5.0
FBSA	0.5	5.0
4:2 FTSA	0.5	5.0
6:2 FTSA	0.5	5.0
8:2 FTSA	0.5	5.0
M3PFBA (SS)	0.4	4.0
MPFHxA (SS)	0.4	4.0
MPFOA (SS)	0.4	4.0
MPFUnDA (SS)	0.4	4.0
M2PFTeDA (SS)	0.4	4.0
M3PFBS (SS)	0.4	4.0
MPFHxS (SS)	0.4	4.0
MPFOS (SS)	0.4	4.0
M2-8:2 FTSA (SS)	0.4	4.0
MPFBA (IS)	5.0	5.0
M8PFOA (IS)	5.0	5.0
M7PFUnDA (IS)	5.0	5.0
M3PFHxS (IS)	5.0	5.0
M8PFOS (IS)	5.0	5.0

PFAS Linearity Standards.

Instructions: The linearity for instrumental responses of PFAS can be evaluated using the common calibration standards. The user runs four concentration levels and applies the option to force" origin".

PFAS IDL Standard.

Instructions: The IDL can be estimated using the lowest common calibration standard solution, iPFAS IADN Cal Lvl 1, as well as the equation below:

$$IDL = \frac{3\ conc_{cali}}{SNR_{cali}}$$

where $conc_{cali}$ represents the concentration of a PFAS in the lowest common calibration standard solution, SNR_{cali} represents the corresponding signal-to-noise ratio and the constant "3" indicates that the levels generating peaks with a signal-to-noise ratio greater than 3 are above the IDL, and hence considered detected.