

Attachment 8

Laboratory Assessment 2025-2026 and Earlier

Attachment 8: Laboratory Assessment 2025-2026 and Earlier

NCEH MASTER LIST OF ANALYTES TABLE LEGEND	
	Empty cell indicates that the analyte was not measured or reported to NCHS during that cycle
•	Measured during cycle and reported to NCHS via data file submission, or measurement is planned for future NHANES survey
P	Sample was pooled during cycle
Surplus	Measurement of analyte originally planned for regular NHANES but later converted to surplus sample request during cycle, per NCHS
& Surplus	Table data published in exposure report as regular sample and as surplus sample (updated data, children only data, etc.)
NO PRBC	No Packed Red Blood Cells (PRBC) available during cycle
C	Measuring is contingent upon funding and other resources during cycle
X1	Measured but not reported, as MECs were contaminated with those analytes
WD	Analyte/chemical originally intended to be measured and withdrawn during cycle; please follow up with branch for description
D	Dropped during cycle/cycled out; unless otherwise stated, most common reason is no detection
DEV	Method in development during cycle
Strikethrough	Analyte methodology discontinued/dropped for methods issues; included in table for archival purposes
x	Was not approved by NCHS
♀	Female
♂	Male
{Analyte} Isomer	Refer to one of the isomer associated with specified analyte

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Formaldehyde	PRBC	Full set, then 1/3	Full set, then 1/2	NO PRBC	●	●	D	D	D	
Acrylamide					●	●	D	D	D	
Glycidamide					●	●	D	D	D	
Ethylene Oxide					●	●	●	●	D	
Acrylonitrile		1/3 of 6+	1/2 of 5+						●	
Sex Steroid Hormones (Reproductive Hormones)										
Estradiol, Total (E2)	Serum	Proposed 6+, only this Analyte 2–4	Proposed: 5+ , only this Analyte 2-4		●	●	Surplus	●	●	
Steroid Hormone–Binding Globulin (SHBG)					●	●	Surplus	●	●	
Testosterone, Total (TT)				●	●	●	x	●	●	
17α-Hydroxyprogesterone (17-OHP) / Hydroxyprogesterone							Surplus	●	●	
Progesterone (P4)							Surplus	●	●	
Estrone (E1)							Surplus	●	●	
Estrone sulfate (E1S)							Surplus	●	●	
Androstenedione (AD)							Surplus	●	●	
Dehydroepiandrosterone sulfate (DHEAS)							x	●	●	
Anti-Müllerian hormone (AMH)		♀ 6+	, ♀ 5+				Surplus	●	●	
Follicle-stimulating hormone (FSH)		6+	5+				Surplus	●	●	
Luteinizing hormone (LH)							Surplus	●	●	
Trans Fatty Acids										
trans-9-Hexadecenoic acid	Plasma	1/3 of 3+	1/2 of 3+	D					●	
trans-9-Octadecenoic acid				D					●	
trans,trans-9,12-Octadecadienoic acid				D					●	
trans-11-Octadecanoic acid				D					●	
Thyroid Function										
Free thyroxine (FT4)	Serum	N/A	TBA							●
Total thyroxine (TF4)										●
Thyroid peroxidase antibodies										●
Thyroglobulin antibodies										●
Thyroid-stimulating hormone (TSH)										●
(TSH) receptor antibodies										●

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Thyroglobulin *										C	
Free T3 * -Triiodothyronine										C	
Total T3 * -Triiodothyronine										●	
Fructose (CT)										●	
Cholinesterase Assays in Blood and Serum											
RBC Acetylcholinesterase activity (AChE activity)	Whole Blood	Full Set, 6+	Full Set, 5+					x	●		
Butyrylcholinesterase activity (BChE activity)	Serum									●	●
Butyrylcholinesterase concentration (BChE)										●	●
Chlorinated Tyrosines											
Serum 3-chlorotyrosine	Serum	6+	5+			●		x			
Serum 3,5-dichlorotyrosine						●					
Metals and Metalloids											
Antimony	Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+	●	●	●	●	●	●	●	
Arsenic (total)				●	●	●	●	●	●	●	●
Arsenic (V) acid				●	●	●	●	●	●	●	●
Arsenobetaine				●	●	●	●	●	●	●	●
Arsenocholine				●	●	●	●	●	●	●	●
Arsenous (III) acid				●	●	●	●	●	●	●	●
Dimethylarsinic acid				●	●	●	●	●	●	●	●
Monomethylarsonic acid				●	●	●	●	●	●	●	●
Trimethylarsine oxide				●	D						
Barium				●	●	●	●	●	●	●	●
Beryllium				D							
Cadmium				Whole Blood	Full; 1/2 (13–14)	1+	●	●	●	●	●
Cadmium	Urine	3–5 & 1/3 of 6+	3-4 & 1/2 of 5+	●	●	●	●	●	●	●	
Cesium				●	●	●	●	●	●	●	●
Chromium							●	●	●	●	●
Chromium	Whole Blood	40+	1+			●	●	D			
Cobalt						●	●	D			

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Cobalt		Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+	●	●	●	●	●	●	●
Copper		Serum	1/3 of 12+	1/2 of 12+	●	●	●	D			
Lead		Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+	●	●	●	●	●	●	●
Lead		Whole Blood	Full; 1/2 (13–14)	Full; 1+	●	●	●	●	●	●	●
Manganese			Full; 1/2 (13–14)	1+	●	●	●	●	●	●	●
Manganese		Urine	3–5 & 1/3 of 6+	3-4 & 1/2 5+	●	●	●	●	●	●	
Mercury (total)		Whole Blood	Full; 1/2 (13–14)	1+	●	●	●	●	●	●	●
Mercury (inorganic)		Urine			●	●	●	●	●	●	●
Mercury (ethyl)					●	●	●	●	●	●	●
Mercury (methyl)					●	●	●	●	●	●	●
Mercury			3–5 & 1/3 of 6+	3-4 & 1/2 of 5+	●	●	●	●	●	●	●
Molybdenum					●	●	●	●	●	●	●
Nickel								●	●	●	●
Platinum						D					
Selenium		Whole Blood	Full; 1/2 (13–14)	Full; 1/2 (13-14)	●	●	●	●	●	●	●
Selenium		Serum	1/3 of 12+	1/2 of 12+	●	●	●	D			
Strontium		Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+	●	●	●	●	●	●	●
Thallium					●	●	●	●	●	●	●
Tin					●	●	●	●	●	●	●
Tungsten					●	●	●	●	●	●	●
Uranium					●	●	●	●	●	●	
Zinc		Serum	1/3 of 12+	1/2 of 12+	●	●	●	D			
Iodine		Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+	●	●	●	●	●	●	●
Iodine		Salt							●	D	
Iodine		Salt							●	D	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Fluoride		Water	0–19 & MEC examined	0–17 & MEC examined					●	D		
Fluoride		Urine	6-19	5-19		●	●	D				
Caffeine and Metabolites												
5-acetylamino-6-amino-3-methyluracil		Urine	6+	N/A	●	●	D					
1-methyluric acid					●	●	D					
3-methyluric acid					●	●	D					
7-methyluric acid					●	●	D					
1,3-dimethyluric acid					●	●	D					
1,7-dimethyluric acid					●	●	D					
3,7-dimethyluric acid					●	●	D					
1,3,7-trimethyluric acid					●	●	D					
1-methylxanthine					●	●	D					
3-methylxanthine					●	●	D					
7-methylxanthine					●	●	D					
1,3-dimethylxanthine (theophylline)					●	●	D					
1,7-dimethylxanthine (paraxanthine)					●	●	D					
3,7-dimethylxanthine (theobromine)					●	●	D					
1,3,7-trimethylxanthine (caffeine)					●	●	D					
Fatty acids (30)												
Capric acid (C10:0)		Plasma /Serum	NH11–14 3+ & 12+ fasting	N/A	●	●	D					
Lauric acid (C12:0)					●	●	D					
Myristic acid (14:0)					●	●	D					
Pentadecanoic acid (C15:0)					●	●	D					
Palmitic acid (16:0)					●	●	D					
Margaric acid (C17:0)					●	●	D					
Stearic acid (18:0)					●	●	D					
Arachidic acid (20:0)					●	●	D					
Docosanoic acid (22:0)					●	●	D					
Tricosanoic acid (C23:0)					●	●	D					

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Lignoceric acid (24:0)					●	●	D				
Myristoleic acid (14:1n-5)					●	●	D				
Palmitoleic acid (16:1n-7)					●	●	D				
cis-Vaccenic acid (18:1n-7)					●	●	D				
Oleic acid (18:1n-9)					●	●	D				
Eicosenoic acid (20:1n-9)					●	●	D				
Docosenoic acid (22:1n-9)					D						
Nervonic acid (24:1n-9)					●	●	D				
Linoleic acid (18:2n-6)					●	●	D				
alpha-Linolenic acid (18:3n-3)					●	●	D				
gamma-Linolenic acid (18:3n-6)					●	●	D				
Stearidonic acid (C18:4n-3)					●	●	D				
Eicosadienoic acid (20:2n-6)					●	●	D				
homo-gamma-Linolenic acid (20:3n-6)					●	●	D				
Eicosatrienoic acid (C20:3n-9)					●	●	D				
Arachidonic acid (20:4n-6)					●	●	D				
Eicosapentaenoic acid (20:5n-3)					●	●	D				
Docosatetraenoic acid (22:4n-6)					●	●	D				
Docosapentaenoic acid (22:5n-3)					●	●	D				
Docosapentaenoic acid (22:5n-6)					●	●	D				
Docosahexaenoic acid (22:6n-3)					●	●	D				
Fatty acids in RBCs (NBB)											
% alpha-Linolenic acid (C18:3n3)		RBC	6+	5+					●	●	
% Arachidic acid (C20:0)									●	●	
% Arachidonic acid (C20:4n6)									●	●	
% Docosanoic acid (C22:0)									●	●	
% Docosahexaenoic acid (C22:6n3)									●	●	
% Docosapentaenoic acid 3 (C22:5n3)									●	●	
% Docosapentaenoic acid 6 (C22:5n6)									●	●	
% Docosatetraenoic acid (C22:4n6)									●	●	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
% Docosatetraenoic acid (C22:4n6)								•	•	
% 11-Eicosenoic acid (C20:1n9)								•	•	
% Eicosapentaenoic acid (C20:5n3)								•	•	
% gamma-Linolenic acid (C18:3n6)								•	•	
% homo-gamma-Linolenic acid (C20:3n6)								•	•	
% Tetracosanoic acid (C24:0)								•	•	
% Linoleic acid (C18:2n6)								•	•	
% Myristic acid (C14:0)								•	•	
% 15-Tetracosenoic acid (C24:1n9)								•	•	
% Oleic acid (C18:1n9)								•	•	
% Palmitoleic acid (C16:1n7)								•	•	
% Palmitic acid (C16:0)								•	•	
% Stearic acid (C18:0)								•	•	
Fat-Soluble Vitamins and Micronutrients										
Vitamin A		Serum	NH17-18: 6+	5+				•	D	C
Vitamin E				N/A				•	D	
Retinyl palmitate								•	D	
Retinyl stearate								•	D	
Gamma-Tocopherol								•	D	
delta-Tocopherol										
alpha-carotene								•	D	
Trans-beta-carotene								•	D	
Cis-beta-carotene								•	D	
alpha-Cryptoxanthin								•	D	
beta-Cryptoxanthin								•	D	
Lutein/zeaxanthin combined or measured and reported as separate analytes								•	D	
trans-Lycopene								•	D	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Total lycopene								●	D		
25-OH Vitamin D (D2 + D3)				5+	●	●	●	●	D	C	
25-OH Vitamin D2					●	●	●	●	D	C	
25-OH Vitamin D3					●	●	●	●	D	C	
epimer-25-OH Vitamin D3					●	●	●	●	D	C	
Iron-Status and Inflammation Indicators											
Ferritin		Serum	NH03–16: 1–5 & ♀ 12–49 NH17–20: 1–5 & 12+	1-5 & 12+	D		Surplus	Surplus	●	C	
Transferrin receptor			NH03–16: 1–5 & ♀ 12–49 NH17–18: 1–5 & 12+ NH19–20: 1–5y & ♀ 12–49	1-5 & ♀ 12-49	D		●	●	●	C	
Alpha-acid-1-glycoprotein			NH15–18: 1–5 & ♀ 12–49				●	●		C	
Iron			1/3	1/2							
TIBC											
Transferrin saturation											
Protoporphyrin											
Phytoestrogens and Metabolites											
Daidzein		Urine	6+	N/A	D						
Enterodiol					D						
Enterolactone					D						
Equol					D						
Genistein					D						
O-Desmethylangolensin					D						
Water-Soluble Vitamins and Related Compounds											

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Folate (Serum)	Serum	1+	N/A	D							
Folate (RBC)	RBC	NH11–16: 1+ NH17–20: ♀ 12–49; 1/2 (♂ 1+, ♀ 1–11 & 50+)	♀ 12–49 ; 1/2 (♂ 1+, ♀ 1–11 & 50+)	•	•	•	•	•	C		
Total folate (calculated)				•	•	•	•	•	C		
5-Methyltetrahydrofolate				•	•	•	•	•	C		
Folic acid				•	•	•	•	•	C		
5-Formyltetrahydrofolate				•	•	•	•	•	C		
Tetrahydrofolate				•	•	•	•	•	C		
5,10-Methenyltetrahydrofolate				•	•	•	•	•	C		
MeFox oxidation product				•	•	•	•	•	C		
Folate forms by LC-MS/MS	Serum	1/3	1/2								
Folate forms by LC-MS/MS (RBC)			1/3								
Total folate (calculated)	RBC	NH19–20: 6+	5+					•	C		
5-Methyltetrahydrofolate								•	C		
Folic acid								•	C		
5-Formyltetrahydrofolate								•	C		
Tetrahydrofolate								•	C		
5,10-Methenyltetrahydrofolate								•	C		
MeFox oxidation product								•	C		
Homocysteine				Plasma	20+	N/A					
Methylmalonic acid	Plasma/ Serum	3+	5+	•	•	D				•	
Vitamin B12	Serum	20+		•	•	D					•
Vitamin B6 (pyridoxal-5'-phosphate)		1+		D							•
Vitamin B6 (4-pyridoxic acid)			D							•	
Vitamin C (ascorbic acid)		NH17–18: 6+					•	D	C		
Vitamin D											
Personal Care and Consumer Product Chemicals and Metabolites											
Benzophenone-3	Urine	1/3	3–4 & 1/2 of 5+	•	•	•	•	•	•		
Bisphenol A				•	•	•	•	•	•		
Bisphenol F					•	•	•	•	•		

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Bisphenol S					●	●	●	●	●	
Triclocarban					●	●	●	●	●	
4-tert-Octyl phenol				D						
Triclosan				●	●	●	●	●	●	
Butyl paraben				●	●	●	●	●	●	
Hydroxy Butyl paraben							Surplus	●	●	
Ethyl paraben				●	●	●	●	●	●	
Methyl paraben				●	●	●	●	●	●	
n-Propyl paraben				●	●	●	●	●	●	
Di-hydroxy avobenzene							Surplus	●	●	
2,4-Dichlorophenol				●	●	●	●	●	●	
2,5-Dichlorophenol				●	●	●	●	●	●	
Flame-Retardant Metabolites										
Bis(1-chloro-2-propyl) phosphate (BCPP)	Urine	1/3	3–4 & 1/2 of 5+	Surplus	Surplus		Surplus	●	●	
Bis(2-chloroethyl) phosphate (BCeTP)						Surplus	●	●		
Bis(1,3-dichloro-2-propyl) phosphate (BDCPP)						Surplus	●	●		
Dibenzyl phosphate (DBzP)						Surplus	D			
Dibutyl phosphate (DBuP)						Surplus	●	●		
Di-o-cresylphosphate (DoCP)										
Di-p-cresylphosphate (DpCP)										
Di-cresyl phosphate (DCP)				Surplus		Surplus	D	D		
Diphenyl phosphate (DPhP)					Surplus	Surplus	Surplus	●	●	
2,3,4,5-Tetrabromobenzoic acid (TBBA)					Surplus	Surplus	Surplus	●	●	
2-((isopropyl)phenyl) phenyl phosphate (iPPPP)						Surplus	Surplus		●	
4-((tert-butyl)phenyl)phenyl phosphate (tBPPP)						Surplus	Surplus		●	
Bis(2-butoxyethyl) phosphate (BBOEP)			1/2							●
Bis(2-butoxyethyl) 2-hydroxyethyl phosphate (BBOEHEP)										●
Bis(2-butoxyethyl) [(3-hydroxybutyl)oxy]ethyl phosphate (3HO-TBOEP)										●
2-ethylhexyl phenyl phosphate (EHPHP)										●

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
2-ethyl-5-hydroxyhexyl diphenyl phosphate (5HO-EHDPP)										●	
1-hydroxy-2-propyl bis(1-chloro-2-propyl) phosphate (BCIPHIPP)										●	
Tris(2-chloroethyl)phosphate (TCEtP)										●	
Dibutyl 3-Hydroxybutyl Phosphate (3HO-TBuP)										●	
Di isobutyl phosphate (DiBuP)										●	
4-Hydroxyphenyl diphenyl phosphate (4HO-DPhP)										●	
2-(2-Methylphenoxy)-4H-1,3,2-benzodioxaphosphorin 2-oxide (CBDP)											●
Fungicides and Metabolites (OAT)											
ortho-Phenylphenol		Urine			D						
Ethylenethio Urea (ETU)											
Pentachlorophenol											
Propylenethio Urea (PTU)											
Herbicides and Metabolites											
Atrazine		Urine	1/3	1/2							
Atrazine mercapturate											
Desethyl atrazine											
Desisopropyl atrazine											
Desisopropyl atrazine mercapturate											
Diaminochloroatrazine											
2,4-Dichlorophenoxyacetic acid					●	●	●	●	●	●	
2,4,5-Trichlorophenoxyacetic acid					D						
Desethyl atrazine mercapturate											
N-(phosphonomethyl)glycine (Glyphosate)						& Surplus	Surplus	Surplus		●	
N-Acetyl-AMPA								Surplus		●	
N-Acetyl-glyphosate										●	
Aminomethylphosphonic acid (AMPA)						Surplus	Surplus			D	
Dicamba (3,6-dichloro-2-methoxybenzoic acid)										●	
3,6 Dichlorosalicylic acid (dicamba metabolite)										●	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Glufosinate (Phosphinothricin; (RS)-2-Amino-4-(hydroxy(methyl)phosphonoyl)butanoic acid)										●	
N-Acetyl-glufosinate (N-acetylphosphinothricin)									●		
3-(Methylphosphinico)propionic acid (glufosinate metabolite)									●		
Sulfonyl Urea Herbicides (Herbicides: Substituted Ureas)											
Bensulfuron-methyl		Urine	1/3	1/2							
Chlorsulfuron											
Ethametsulfuron-methyl											
Foramsulfuron											
Halosulfuron											
Mesosulfuron-methyl											
Metsulfuron-methyl											
Nicosulfuron											
Oxasulfuron											
Primisulfuron-methyl											
Prosulfuron											
Rimsulfuron											
Sulfometuron-methyl											
Sulfosulfuron											
Thifensulfuron-methyl											
Triasulfuron											
Triflursulfuron-methyl											
Insect Repellent and Metabolites											
N,N-Diethyl-meta-toluamide (DEET)		Urine	1/3	1/2	●	●	D				
3-(Diethylcarbamoyl) benzoic acid (DEET acid/DCBA)					●	●	●	●	●	●	
3-(Ethylcarbamoyl) benzoic acid (MEA/ECBA)							Surplus	●	●	●	
N,N-Diethyl-3-(hydroxymethyl) benzamide (Desethyl hydroxy DEET/DHMB)					●	●	D				
Neonicotinoid Insecticides											
Acetamiprid (ACET)		Urine	1/3	1/2			Surplus	Surplus	●	D	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Clothianidin (CLOT)									●	●		
N-Desmethylacetamiprid (AND)										●	●	
5-Hydroxyimidacloprid (OHIM)										●	●	
Imidacloprid (IMID)									●	D		
Thiacloprid (THIA)									●	D		
Clothianidin Desmethyl (CLOD)										●		
Clothianidin Urea (CLOU)										●		
Flupyradifurone (FLUP)										●		
Imidacloprid Guanidine (IMIG)										●		
Nitenpyram Desmethyl (NITD)										●		
Thiamethoxam Desmethyl (TMXD)										●		
Sulfoxaflor 1 (SLF1)										●		
Sulfoxaflor 2 (SLF2)										●		
Carbamate Pesticide Metabolites												
Carbofuranphenol			Urine	1/3	1/2							
2-Isopropoxyphenol												
Organophosphorus Insecticides: Dialkyl Phosphate Metabolites												
Diethylphosphate (DEP)		Urine	1/3	1/2	●	D	●	●	●	●		
Dimethylphosphate (DMP)					●	D	●	●	●	●		
Diethylthiophosphate (DETP)					●	D	●	●	●	●		
Dimethylthiophosphate (DMTP)						●	D	●	●	●	●	
Diethyldithiophosphate (DEDTP)		●				D	●	●	●	●		
Dimethyldithiophosphate (DMDTP)		●				D	●	●	●	●		
Organophosphorus Insecticides: Specific Metabolites												
Acephate		Urine	1/3	1/2								
Dimethoate												
Methamidaphos												
Omethoate												
Malathion dicarboxylic acid					●	●	●	●	●	D		
2-Isopropyl-4-methyl-6-hydroxypyrimidine (IMPY)						●	●	●	●	●	●	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
para-Nitrophenol					●	●	●	●	●	●	
3,5,6-Trichloro-2-pyridinol (TCPy)					●	●	●	●	●	●	
2-diethylamino-6-methyl pyrimidin-4-ol											
Pyrethroid Metabolites											
trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA)		Urine	44929	44928	●	●	●	●	●	●	
cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DBCA)					●	●	●	●	●	D	
4-Fluoro-3-phenoxybenzoic acid (4F3PBA)					●	●	●	●	●	D	
3-Phenoxybenzoic acid (3PBA)					●	●	●	●	●	●	
cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DCCA)											
Organochlorine Pesticides and Metabolites											
Aldrin		Serum	1/3	1/2							
Dieldrin											
Endrin											
Heptachlor Epoxide											
Oxychlordane					P	P	P	●	●	●	
trans-Nonachlor					P	P	P	●	●	●	
p,p'-DDT					P	P	P	●	●	●	
p,p'-DDE					P	P	P	●	●	●	
o,p'-DDT											
Hexachlorobenzene					P	P	P	●	●	●	
beta-Hexachlorocyclohexane					P	P	P	●	●	●	
gamma-Hexachlorocyclohexane					P	D					
Mirex					P	P	P	●	●	●	
2,4,5-Trichlorophenol					Urine	D					
2,4,6-Trichlorophenol		D									
Polybrominated Diphenyl Ethers and Brominated Biphenyl 153											
2,2',4'-Tribromodiphenyl ether (BDE 17)		Serum	1/3	1/2	P	P	P	●	●	●	
2,4,4'-Tribromodiphenyl ether (BDE 28)					P	P	P	●	●	●	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)					P	P	P	●	●	●		
2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)					P	P	P					
2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)					P	P	P	●	●	●		
2,2',4,4',5-Pentabromodiphenyl ether (BDE 99)					P	P	P	●	●	●		
2,2',4,4',6-Pentabromodiphenyl ether (BDE 100)					P	P	P	●	●	●		
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)					P	P	P	●	●	●		
2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)					P	P	P	●	●	●		
2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183)					P	P	P	●	●	●		
2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)					P	P	P	●	●	●		
2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)					P	P	P	●	●	●		
Polychlorinated Dibenzo-p-dioxins												
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)		Serum	1/3	1/2	P	P	P	●	●	●		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)					P	P	P	●	●	●		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)					P	P	P	●	●	●		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)					P	P	P	●	●	●		
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)					P	P	P	●	●	●		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)					P	P	P	●	●	●		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)					P	P	P	●	●	●		
Polychlorinated Dibenzofurans												
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)		Serum	1/3	1/2	P	P	P	●	●	●		
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)					P	P	P	●	●	●		
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)						P	P	P	●	●	●	
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)						P	P	P	●	●	●	
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)						P	P	P	●	●	●	
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)						P	P	P	●	●	●	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)						P	P	P	●	●	●	
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)						P	P	P	●	●	●	
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)						P	P	P	●	●	●	
2,3,7,8-Tetrachlorodibenzofuran (TCDF)						P	P	P	●	●	●	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Dioxin-like Polychlorinated Biphenyls: Coplanar PCBs										
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	Serum	1/3	1/2	P	P	P	●	●	●	
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)				P	P	P	●	●	●	
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)				P	P	P	●	●	●	
Dioxin-like Polychlorinated Biphenyls: Mono-ortho-Substituted PCBs										
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	Serum	1/3	1/2	P	P	P	●	●	●	
2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)				P	P	P	●	●	●	
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)				P	P	P	●	●	●	
2',3,4,4',5-Pentachlorobiphenyl (PCB 123)										
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)				P	P	P	●	●	●	
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)				P	P	P	●	●	●	
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)				P	P	P	●	●	●	
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)				P	P	P	●	●	●	
Polychlorinated Biphenyls: Non-Dioxin-Like										
2,4,4'-Trichlorobiphenyl (PCB 28)	Serum	1/3	1/2	P	P	P	●	●	●	
2,2'3,5'-Tetrachloro biphenyl (PCB 44)										
2,2',4,5'-Tetrachloro biphenyl (PCB 49)										
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)										
2,3',4,4'-Tetrachlorobiphenyl (PCB 66)				P	P	P	●	●	●	
2,4,4',5-Tetrachlorobiphenyl (PCB 74)				P	P	P	●	●	●	
2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)										
2,2',4,4',5-Pentachlorobiphenyl (PCB 99)				P	P	P	●	●	●	
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)										
2,3,3',4',6-Pentachlorobiphenyl (PCB 110)										
2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)										
2,2',3,4,4',5' and 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158)				P	P	P	●	●	●	
2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146)				P	P	P	●	●	●	
2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149)										
2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151)										

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)				P	P	P	•	•	•	
2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)				P	P	P	•	•	•	
2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172)										
2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177)										
2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178)				P	P	P	•	•	•	
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)				P	P	P	•	•	•	
2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)				P	P	P	•	•	•	
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)				P	P	P	•	•	•	
2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195)									•	
2,2',3,3',4,4',5,6' and 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203)				P	P	P	•	•	•	
2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5',6,6'-Decachloro biphenyl (PCB 209)				P	P	P	•	•	•	
Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants										
Perfluorobutane sulfonic acid (PFBS)	Serum			•	& Surplus	D				
Perfluorodecanoic acid (PFDA)				•	& Surplus	•	•	•	•	
Perfluorododecanoic acid (PFDoA)				•	& Surplus	•	D			
Perfluoroheptanoic acid (PFHpA)				•	& Surplus	D				
Perfluorohexane sulfonic acid (PFHxS)				•	& Surplus	•	•	•	•	
Perfluorononanoic acid (PFNA)				•	& Surplus	•	•	•	•	
Perfluorooctanoic acid (PFOA)				•	& Surplus					
n-Perfluorooctanoic acid (n-PFOA)					& Surplus	•	•	•	•	
Branched Perfluorooctanoic acid isomers (Sb-PFOA)*					Surplus	•	•	•	•	
Perfluorooctane sulfonic acid (PFOS)				•	•					

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
n-Perfluorooctane sulfonic (n-PFOS)					• Surplus	•	•	•	•	
Perfluoromethylheptane sulfonic acid isomers (Sm-PFOS)*						•	•	•	•	
Perfluorooctane sulfonamide (PFOSA or FOSA)				•						
Perfluoroheptanesulfoic acid (PFHpS)							& Surplus	D		
Perfluorohexanoic acid (PFHxA)							Surplus	D		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)								D		
Adona (4,8-dioxa-3H-perfluorononanoic acid) (ADONA)								D		
GenX (2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA))								D		
2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA)				•	Surplus					
2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA)				•		•	•	•	•	
Perfluoroundecanoic acid (PFUA or PFUnDA)				•		•	•	•	•	
Perfluoroalkyl and Polyfluoroalkyl Substances: Urine										
Perfluorobutanoic acid (PFBA)	Urine	1/3	1/2		& Surplus		Surplus	D		
PFBS										
PFDA										
Perfluoroheptane sulfonic acid (PFHpS)		1/3	1/2				Surplus	D	•	
PFHpA										
PFHxS										
Perfluorohexanoic acid (PFHxA)		1/3	1/2				Surplus	D	•	
PFNA										
n-PFOA										
Sb-PFOA										
n-PFOS										
Sm-PFOS										
Perfluoropentanoic acid (PFPeA)		1/3	1/2				Surplus	D		
PFUnDA										
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)		1/3	1/2				Surplus	D		

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Adona (4,8-dioxa-3H-perfluorononanoic acid) (ADONA)							Surplus	D			
GenX (2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA))							Surplus	D			
Phthalate and Phthalate Alternative Metabolites											
Mono-benzyl phthalate (MBzP)	Urine				•	•	•	•	•	•	
Mono-2-hydroxybutyl phthalate (MHBP)						Surplus	•	•	•	•	
Mono-n-butyl phthalate (MnBP)					•	•	•	•	•	•	
Mono-iso-butyl phthalate (MiBP)					•	•	•	•	•	•	
Mono-2-hydroxyisobutyl phthalate (MHiBP)	Urine		1/3	1/2		& Surplus	& Surplus	& Surplus	•	•	
Mono-cyclohexyl phthalate (MCHP)					D						
Mono-ethyl phthalate (MEP)					•	•	•	•	•	•	
Mono-2-ethylhexyl phthalate (MEHP)					•	•	•	•	•	•	
Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)					•	•	•	•	•	•	
Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)					•	•	•	•	•	•	
Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)					•	•	•	•	•	•	
Mono-carboxyisononyl phthalate (MCNP)					•	•	•	•	•	•	
Mono-oxoisodecyl phthalate (MODP)							WD	WD	D		
Mono-isononyl phthalate (MiNP)					•	•	•	•	D		
Mono-oxoisononyl phthalate (MONP)							& Surplus	& Surplus	•	•	
Mono-carboxyisoctyl phthalate (MCOP)					•	•	•	•	•	•	
Mono-methyl phthalate (MMP)					•	D					
Mono-(3-carboxypropyl) phthalate (MCP)					•	•	•	•	•	•	
Mono-n-octyl phthalate (MOP)					D						
Cyclohexane 1,2-dicarboxylic acid mono hydroxy isononyl ester (MHNCH®)					•	•	•	•	•	•	
Cyclohexane-1,2-dicarboxylic acid-mono(carboxyoctyl) ester (MCOCH)						WD	•	•	•	•	
Mono (2-ethyl-5-carboxypentyl) terephthalate (MECPTP)							& Surplus	& Surplus	•	•	
Mono (2-ethyl-5-hydroxyhexyl) terephthalate (MEHHTP)							& Surplus	& Surplus	•	•	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Polycyclic Aromatic Hydrocarbon Metabolites										
2-Hydroxyfluorene	Urine	1/3	1/2	●	●	●	●	●	●	
3-Hydroxyfluorene				●	●	●	●	●	●	
9-Hydroxyfluorene				●	D					
1-Hydroxyphenanthrene				●	●	●	●	●	●	
2-Hydroxyphenanthrene				●	D					
3-Hydroxyphenanthrene				●	D					
2- & 3-Hydroxyphenanthrene					●	●	●	●	●	
4-Hydroxyphenanthrene				●	D					
1-Hydroxypyrene				●	●	●	●	●	●	
1-Hydroxynaphthalene (1-Naphthol)				●	●	●	●	●	●	
2-Hydroxynaphthalene (2-Naphthol)				●	●	●	●	●	●	
Phenylpyrazole insecticides (fipronil)										
Fipronil ((RS)-5-Amino-1-[2,6-dichloro-4-(trifluoromethyl)phenyl]-4-(trifluoromethylsulfinyl)pyrazole-3-carbonitrile)	Urine	1/3	1/2	-	-	Surplus	Surplus	-	●	-
Fipronil desulfinyl				-	-	Surplus	Surplus	-	●	-
Fipronil Sulfone				-	-	Surplus	Surplus	-	●	-
Fipronil Carboxamide				-	-	Surplus	Surplus	-	●	-
Fipronil Sulfide				-	-	Surplus	Surplus	-	●	-
Hydroxy Fipronil	-			-	-	Surplus	Surplus	-	●	-
Tobacco Alkaloids and Metabolites (Cotinine and Nicotine Analogs)										
Anabasine, Total	Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+		●	●	●	●	●	
Anatabine, Total					●	●	●	●	●	
Cotinine	Serum	3+	2+	●	●	●	●	●	●	
Cotinine, Total	Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+		●	●	●	●	●	
Cotinine N-Oxide, Total					●	●	●	●	●	
trans-3'-Hydroxycotinine, Total	Serum	3+	2+		●	●	●	●	●	
trans-3'-Hydroxycotinine, Total	Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+		●	●	●	●	●	
Norcotinine	-			-	●	●	WD	WD	D	-

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
1-(3-Pyridyl)-1-butanol-4-carboxylic acid						WD	●	●	●	●	
Nicotine						●	●	●	●	●	
Nicotine 1'-Oxide, Total						●	●	●	●	●	
Nornicotine						●	●	●	●	●	
Tobacco Biomarkers: Tobacco-specific Nitrosamines (TSNAs)											
N'-Nitrosoanabasine (NAB)		Urine	3–5 & 1/3 of 6+	3–4 & 1/2 of 5+		●	WD	WD	WD	WD	
N'-Nitrosoanatabine (NAT)						●	WD	WD	WD	WD	
N'-Nitrososornicotine (NNN)						●	WD	WD	WD	WD	
4-(Methylnitrosamino)-1-(3-pyridyl)-1-Butanol (NNAL)					●	●	●	●	●	●	
4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)						WD	WD	WD	WD	WD	
Tobacco Biomarkers: Volatile N-Nitrosamines											
N-Nitrosodiethylamine (NDEA)		Urine	1/3	1/2		●	WD	D	D	D	
N-nitrosodimethylamine (NDMA)						WD	WD	D	D	D	
N-Nitrosoethylmethylamine (NMEA)						●	WD	D	D	D	
N-nitrosomorpholine (NMOR)						●	WD	D	D	D	
N-Nitrosopiperidine (NPIP)						●	WD	D	D	D	
N-Nitrosopyrrolidine (NPYR)						●	WD	D	D	D	
Disinfection Byproducts - Volatile Organic Compounds (VOCs) - Trihalomethanes & MTBE (IN WATER)											
Bromodichloromethane		Water	1/3	1/2	D						
Dibromochloromethane (Chlorodibromomethane)					D						
Tribromomethane (Bromoform)					D						
Trichloromethane (Chloroform)					D						
Methyl tert-butyl ether (MTBE)					D						
Disinfection Byproducts - Volatile Organic Compounds (VOCs) - Trihalomethanes & MTBE											
Bromodichloromethane		Whole Blood	1/2 of 12+	1/2 of 12+	●	●	●	●	●	●	
Dibromochloromethane (Chlorodibromomethane)					●	●	●	●	●	●	
Tribromomethane (Bromoform)					●	●	●	●	●	●	
Trichloromethane (Chloroform)					●	●	●	●	●	●	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Perchlorate and Other Anions											
Nitrate		Urine	1/3	1/2	●	●	●	●	●	●	
Perchlorate					●	●	●	●	●	●	
Thiocyanate					●	●	●	●	●	●	
Perchlorate	-	Water	1/3	1/2	-	-	-	-	-	-	
Nitrate	-			-	-	-	-	-	-	-	
Fluoride	-	Urine	-	-	-	-	WD	WD	D	-	
Iodide	-	Water	-	-	-	-	-	-	-	-	
Tobacco Biomarkers: Heterocyclic Amines											
3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)		Urine	1/3	1/2		●	D	WD	WD	D	
2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA-α-C)						●	D	WD	WD	D	
2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP)						●	D	WD	WD	D	
2-Amino-9H-pyrido[2,3-b]indole (A-α-C)						●	D	WD	WD	D	
2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ)						●	D	WD	WD	D	
2-Amino-6-methyldiprido[1,2-a:3',2'-d]imidazole (Glu-P1)						●	D	WD	WD	D	
2-Aminodiprido[1,2-a:3',2'-d]imidazole (Glu-P2)						●	D	WD	WD	D	
1-Methyl-9H-pyrido[3,4-b]indole (Harman)						●	D	WD	WD	D	
1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)						●	D	WD	WD	D	
9H-Pyrido[3,4-b]indole (Norharman)						●	D	WD	WD	D	
Volatile Organic Compounds (VOCs)											
1,1,1-Trichloroethane (Methyl chloroform)		Whole Blood	1/2 of 12+	1/2 of 12+	●	●	●	●	●	●	●
1,1,1,2-Tetrachloroethane					●	●	●	●	●	D	
1,1,2,2-Tetrachloroethane					●	D					
1,1,2-Trichloroethane					●	D					
1,2,3-Trichloropropane					●	●	●	●	●	●	●
1,1-Dichloroethane					●	D					
1,1-Dichloroethene (Vinylidene chloride)					●	D					

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
1,2-Dibromo-3-chloropropane (DBCP)				D						
1,2-Dibromoethane				•	•	•	•	•	D	
1,2-Dichlorobenzene				•	•	•	•	•	•	•
1,2-Dichloroethane (Ethylene dichloride)				•	•	•	•	•	•	•
cis-1,2-Dichloroethene				•	D					
trans--1,2-Dichloroethylene				•	D					
1,2-Dichloropropane				•	D					
1,3-Dichlorobenzene				•	•	•	•	•	•	•
1,4-Dichlorobenzene (p-Dichlorobenzene)				•	•	•	•	•	•	•
1,4-Dioxane				•	•	•	WD	D		
1-Bromopropane/Propyl bromide					WD	D				
2,5-Dimethylfuran				•	•	•	•	•	•	•
2-Hexanone								WD	•	•
Benzene				•	•	•	•	•	•	•
Benzonitrile					WD	•	•	•	•	•
Chlorobenzene (Monochlorobenzene)				•	•	•	•	•	•	•
Chloroethane					•	•	•	•	•	•
Cyclohexane					•	•	•	•	•	•
Dibromomethane				•	D					
Dichloromethane (Methylene chloride)				•	•	•	•	•	•	•
Diethyl ether					•	•	•	•	•	•
Ethyl acetate					•	•	•	•	•	•
Ethylbenzene				•	•	•	•	•	•	•
Furan				•	•	•	•	•	•	•
n-Heptane					•	•	•	•	•	•
Hexachloroethane				•	D					
n-Hexane				•	•	•	•	•	•	•
Isobutyronitrile					WD	•	•	•	•	•
Isopropylbenzene (Cumene)				•	•	•	•	•	•	•
Methyl tert-butyl ether (MTBE)				•	•	•	•	•	•	•

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Methylcyclopentane						●	●	●	●	●	●
Methyl isobutyl ketone						WD	WD	●	●	●	●
Nitrobenzene					●	●	●	●	●	D	
Nitromethane					●	D					
n-Octane						●	●	●	●	●	●
Styrene		Whole Blood			X1	X1	X1	X1	X1	●	●
Tetrachloroethene (Perchloroethylene)					●	●	●	●	●	●	●
Tetrachloromethane (Carbon tetrachloride)					●	●	●	●	●	●	●
Tetrahydrofuran						●	●	●	●	●	●
Toluene					X1	●	●	X1	X1	●	●
Trichloroethene (Trichloroethylene)					●	●	●	●	●	●	●
α,α,α-Trifluorotoluene						●	●	●	●	D	
Vinyl bromide						●	●	●	●	D	
m-/p-Xylene					●	●	●	●	●	●	●
o-Xylene					●	●	●	●	●	●	●
α-Pinene									●	●	●
Volatile Organic Compound Metabolites (VOC metabolites)											
N-Acetyl-S- (2-carboxyethyl)-L-cysteine (CEMA)		Urine	1/3	3–4 & 1/2 of 5+	●	●	●	●	●	●	●
N-Acetyl-S- (3-hydroxypropyl)-L-cysteine (HPMA)					●	●	●	●	●	●	●
N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (AAMA)					●	●	●	●	●	●	●
N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (GAMA)					●	●	●	●	●	●	●
N-Acetyl-S-(1-cyano-2-hydroxyethyl)-L-cysteine							●	●	●	●	●
N-Acetyl-S-(2-cyanoethyl)-L-cysteine (CYMA)					●	●	●	●	●	●	●
N-Acetyl-S- (2-hydroxyethyl)-L-cysteine (HEMA)					●	●	●	●	●	●	●
N-Acetyl-S-(phenyl)-L-cysteine (PMA)					●	●	●	D			
N-Acetyl-S-(n-propyl)-L-cysteine (BPMA)					●	●	●	●	●	●	●
N-Acetyl-S- (3,4-dihydroxybutyl)-L-cysteine (DHBM)					●	●	●	●	●	●	●

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
N-Acetyl-S- (1-hydroxymethyl-2-propenyl)-L-cysteine (MHB1)	Urine			•	•	•	D			
N-Acetyl-S- (2-hydroxy-3-butenyl)-L-cysteine (MHB2)				•	•	•	D			
N-Acetyl-S-(2-hydroxy-3-methyl-3-buten-1-yl)-L-cysteine + N-Acetyl-S-[1-(hydroxymethyl)-2-methyl-2-propen-1-yl]-L-cysteine					WD	•	D			
N-Acetyl-S- (4-hydroxy-2-butenyl)-L-cysteine (MHB3)				•	•	•	•	•	•	•
N-Acetyl-S-(4-hydroxy-2-methyl-2-buten-1-yl)-L-cysteine						•	•	•	•	•
2-Thioxothiazolidine-4-carboxylic acid (TTCA)				•	•	WD	•	•	•	•
N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (HPMM)				•	•	•	•	•	•	•
2-Aminothiazoline-4-carboxylic acid (ATCA)				•	•	•	•	•	•	•
N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (AMCA)				•	•	•	•	•	•	•
Phenylglyoxylic acid (PHGA)				•	•	•	•	•	•	•
N-Acetyl-S- (2-hydroxypropyl)-L-cysteine (HPM2)				•	•	•	•	•	•	•
N-Acetyl-S-(1-phenyl-2-hydroxyethyl)-L-cysteine + N-Acetyl-S-(2-phenyl-2-hydroxyethyl)-L-cysteine (PHEM)				•	•	•	•	•	•	•
Mandelic acid (MADA)				•	•	•	•	•	•	•
N-Acetyl-S-(trichlorovinyl)-L-cysteine (TCVM)				•	•	•	D			
N-Acetyl-S-(benzyl)-L-cysteine (BMA)				•	•	•	•	•	•	•
N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (1DCV)				•	•	•	D			
N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (2DCV)				•	•	•	D			
N-Acetyl-S-(dimethylphenyl)-L-cysteine (DPMA)				•	•	•	D			
2-Methylhippuric acid (2MHA)				•	•	•	•	•	•	•
3- & 4-Methylhippuric acid (34MH)				•	•	•	•	•	•	•
MMA N-Acetyl-S-methyl-L-cysteine		3-4, 1/2 of 5+								•
PPMA N-Acetyl-S-(6-hydroxy-2,4-cyclohexadiene-1-yl)-L-cysteine)										•
†,† Muconic acid (MUCA)		1/3	1/2	WD	WD	WD	D			
N-Acetyl-S-(((4-(Methylsulfinyl)butyl) amino)thioxomethyl)-L-cysteine (SUMA)										

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Aldehydes										
Acetaldehyde	Serum	1/3 of smokers	1/2 of smokers			D				
Acrolein						D				
Benzaldehyde				●	D					
Butyraldehyde				●	D					
Crotonaldehyde				●	D					
Decanaldehyde				●	D					
Furaldehyde					D					
Heptanaldehyde				●	D					
Hexanaldehyde				●	D					
Isobutyraldehyde					D					
Isopentanaldehyde				●	D					
Nonanaldehyde				●	D					
Octanaldehyde				●	D					
Pentanaldehyde				●	D					
Propanaldehyde				●	D					
o-Tolualdehyde				●	D					
trans-Hexanal					D					
trans-Octenal					D					
trans-Nonenal		D								
Tobacco Biomarkers: Aromatic Amines (TVB)										
	Urine	1/3	1/2		●	WD	WD	WD	D	
1-Aminonaphthalene						WD	WD	WD	D	
2-Aminonaphthalene				●	WD	WD	WD	D		
o-Anisidine				●	WD	WD	WD	D		
2,6-Dimethylaniline				●	WD	WD	WD	D		
o-Toluidine				●	WD	WD	WD	D		
Quinoline	Urine	1/3	1/2	-	WD	WD	WD	WD	D	
Urinary Aromatic Diamines (formerly Diisocyanate metabolites and urinary amines)										
4,4'-Diaminodiphenylmethane (4MDA)	Urine			Surplus		●	D			

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
1,5-Diaminonaphthalene (5NDA)						●	D			
2,4-Diaminotoluene (4TDA)						●	D			
2,6-Diaminotoluene (6TDA)						●	D			
p-Phenylenediamine (PPDA)						●	D			
o-Phenylenediamine (OPDA)				Surplus		WD	D			
5-Amino-1,3,3-trimethylcyclohexanemethylamine (IPDA)						WD	●	●		
Hexamethylenediamine (HAD)						WD	●	●		
β-N-Methylamino-L-alanine (BMAA)						WD	●	●		
Trimethylamine N-oxide (TMAO)						WD	●	●		
Benzene Metabolites (VOC metabolites II)										
N-2-Furoylglycine (N2FG)	Urine	1/3	1/2				Surplus		●	
5-Hydroxymethyl-2-furancarboxylic acid (HMFA)						Surplus		●		
2,5-Furandicarboxylic acid (FDCA)						Surplus				
5-Hydroxymethyl-2-furoylglycine (HMFG)						Surplus		●		
N-Acetyl-S-(phenyl)-L-cysteine (PMA/PHMA)			3–4 & 1/2 of 5+			Surplus	●	●	●	
t,t-Muconic acid (MUCA)/Muconic acid (MUCA)						Surplus	●	●	●	
5-Hydroxy-N-methyl-2-pyrrolidone (5HMP)						WD				
Terpenes in Serum (Terpenes)										
α-Pinene (SAPN)	Serum	1/2 of 5+	1/2 of 5+		Surplus				●	●
β-Pinene (SBPN)								●	●	
β-Myrcene (SBMY)					Surplus			●		
Δ-3-Carene (SD3C)								●		
d-Limonene (SLIM)					Surplus			●	●	
β-Caryophyllene (SBCP)					Surplus			●		
α-Humulene (SAHU)					WD			●		