ADDENDUM NO. 1
TO THE FEBRUARY 2015
REMOVAL ASSESSMENT
QUALITY ASSURANCE SAMPLING PLAN

FOR

WILCOX OIL
WEST 221ST STREET SOUTH / REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

Prepared for

U.S. Environmental Protection Agency Region 6
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TABLE OF CONTENTS

Section **Page**

1. INTRODUCTION 1

2. PROJECT TEAM 1

3. PROJECT OBJECTIVE 2

4. SAMPLING APPROACH 2

4.1 SOIL SAMPLING 2

4.2 LABORATORY ANALYSIS 2

LIST OF APPENDICES

Appendix A EPA Residential Soil Regional Screening Levels (RSLs)

Appendix B Site-Specific Data Quality Objective

Appendix C Proposed Sample Location Maps

Appendix D TDD NO. 5/WESTON-042-15-004

1. INTRODUCTION

Weston Solutions, Inc. (WESTON®), the Superfund Technical Assessment and Response Team (START-3) Contractor, has been tasked by the U.S. Environmental Protection Agency (EPA) Region 6 under Contract Number EP-W-06-042, Technical Direction Document (TDD) No. 5/WESTON-042-15-004 (Appendix D) to conduct a removal assessment at the Wilcox Oil Site located in Bristow, Creek County, Oklahoma. Site coordinates are Latitude 35.842144° North and Longitude 96.381456° West. This is Addendum No. 1 to the February 2015 Removal Assessment Quality Assurance Sampling Plan (QASP) prepared under TDD 5/WESTON-042-15-004. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database number assigned to the site is OK0001010917. All figures are provided as separate portable document format (PDF) files.

2. PROJECT TEAM

The Project Team will consist of Jeff Criner, Site Inspection/Assessment Manager; Derrick Cobb, Project Team Leader (PTL); and additional personnel as necessary. The PTL will be responsible for the technical quality of work performed in the field and will serve as the liaison to EPA Region 6 personnel in the field during the site activities. The PTL, with the concurrence of EPA, will determine the precise location for sample collection in the field, collect samples as necessary, log the activities at each sample location in the field logbook, and verify the sample documentation. The Data Manager will be responsible for entering all samples collected into SCRIBE; producing accurate chain-of-custody documentation for the samples during the assessment; and entering daily operations and sample collection data into the Regional Response Center-Enterprise Data Management System (RRC-EDMS) Response Manager software. The PTL will oversee packaging and shipping of samples to a contracted laboratory. The PTL will also be responsible for providing overall site health and safety support during the removal assessment field activities.

3. PROJECT OBJECTIVE

Performing the removal assessment and collecting the data necessary will assist EPA in determining if the site presents a threat to public health or welfare of the United States or the environment in accordance with 40 Code of Federal Regulations (CFR) 300.415 as well as the extent of such contamination.

The objective of the removal assessment is to investigate the nature and extent of site-related contaminants in the soil associated with the Wilcox Oil Site. This removal assessment will help determine the locations and estimated volumes of soil that may need to be removed during the removal phase. The objective of the removal assessment will be achieved by evaluating both historical data and current analytical results obtained during the collection of samples from representative locations. Soil samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and metals. Soil sample results will be compared to the EPA Residential Soil Regional Screening Levels (RSLs) (Appendix A).

4. SAMPLING APPROACH

The EPA Team will follow soil sampling procedures and appropriate Standard Operating Procedures (SOPs). The Site-Specific Data Quality Objective (DQO) for soil sampling is included as Appendix B.

4.1 SOIL SAMPLING

Approximately 256 soil samples (including quality assurance/quality control samples) will be collected from 58 sample locations on the site. The EPA OSC and START-3 developed a sampling strategy to collect data from residential properties throughout the site and adjacent to the site. Proposed Sample Location Maps are included in Appendix C.

4.2 LABORATORY ANALYSIS

Samples collected will be analyzed by the EPA Region 6 Laboratory and/or by the EPA-designated CLP laboratories. The following methods of analysis will be conducted:

- Volatile Organic Target Compound List – SOM01.2
- Semi-volatile Target Compound List – SOM01.2
- Pesticides/Aroclors Target Compound List – SOM01.2
- Target Analyte List (TAL) Metals (including Mercury) – ISM01.3

EPA will conduct data validation of the site analytical data, and data validation will be conducted in accordance with the EPA CLP National Function Guidelines for Superfund Organic/Inorganic Methods Data Review (June 2008 and January 2010).

APPENDIX A

EPA RESIDENTIAL SOIL REGIONAL SCREENING LEVELS (RSLs)

Key: T = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See PAQ #27); H = HEAST; O = New Jersey; G = EPA Office of Water; I = See PAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1

Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
ALAR	1596-84-5	3.9E+01	1.3E+02	7.5E+05	3.0E+01	1.2E+03	4.4E+03		9.2E+02
Acephate	30560-19-1	8.0E+01	2.6E+02		6.1E+01	3.1E+01	1.2E+02		2.5E+01
Acetaldehyde	75-07-0			1.1E+01	1.1E+01			8.2E+00	8.2E+00
Acetochlor	34256-82-1					1.6E+02	5.8E+02		1.2E+02
Acetone	67-64-1					7.0E+03		4.4E+04	6.1E+03
Acetone Cyanohydrin	75-86-5							5.0E+00	5.0E+00
Acetonitrile	75-05-8							8.1E+01	8.1E+01
Acetophenone	98-86-2					7.8E+02			7.8E+02
Acetylaminofluorene, 2-	53-96-3	1.8E-01	6.0E-01	2.9E+03	1.4E-01				
Acrolein	107-02-8					3.9E+00		1.4E-02	1.4E-02
Acrylamide	79-06-1	3.1E-01	1.1E+00	1.4E+04	2.4E-01	1.6E+01	5.8E+01	8.5E+05	1.2E+01
Acrylic Acid	79-10-7					3.9E+03	1.5E+04	1.4E+05	3.0E+03
Acrylonitrile	107-13-1	1.3E+00		3.2E-01	2.5E-01	3.1E+02		1.6E+00	1.6E+00
Adiponitrile	111-69-3							8.5E+05	8.5E+05
Alachlor	15972-60-8	1.2E+01	4.1E+01		9.5E+00	7.8E+01	2.9E+02		6.2E+01
Aldicarb	116-06-3					7.8E+00	2.9E+01		6.2E+00
Aldicarb Sulfone	1646-88-4					7.8E+00	2.9E+01		6.2E+00
Aldicarb sulfoxide	1646-87-3								
Aldrin	309-00-2	4.1E-02	1.3E-01	7.8E+02	3.1E-02	2.3E-01	8.7E-01		1.8E-01
Ally	74223-64-6					2.0E+03	7.3E+03		1.5E+03
Allyl Alcohol	107-18-6					3.9E+01	1.5E+02	1.4E+04	3.1E+01
Allyl Chloride	107-05-1	3.3E+01		7.4E-01	7.2E-01			1.7E-01	1.7E-01
Aluminum	7429-90-5					7.8E+03		7.1E+05	7.7E+03
Aluminum Phosphide	20859-73-8					3.1E+00			3.1E+00
Amdro	67485-29-4					2.3E+00	8.7E+00		1.8E+00
Ametryn	834-12-8					7.0E+01	2.6E+02		5.5E+01
Aminobiphenyl, 4-	92-67-1	3.3E-02	1.1E-01	6.4E+02	2.5E-02				
Aminophenol, m-	591-27-5					6.3E+02	2.3E+03		4.9E+02
Aminophenol, p-	123-30-8					1.6E+02	5.8E+02		1.2E+02
Amitraz	33089-61-1					2.0E+01	7.3E+01		1.5E+01
Ammonia	7664-41-7								
Ammonium Sulfamate	7773-06-0					1.6E+03			1.6E+03
Amyl Alcohol, tert-	75-85-4							8.2E+00	8.2E+00
Aniline	62-53-3	1.2E+02	4.0E+02	2.4E+06	9.3E+01	5.5E+01	2.0E+02	1.4E+05	4.3E+01
Anthraquinone, 9,10-	84-65-1	1.7E+01	5.7E+01		1.3E+01	1.6E+01	5.8E+01		1.2E+01
Antimony (metallic)	7440-36-0					3.1E+00			3.1E+00
Antimony Pentoxide	1314-60-9					3.9E+00			3.9E+00
Antimony Potassium Tartrate	11071-15-1					7.0E+00			7.0E+00
Antimony Tetroxide	1332-81-6					3.1E+00			3.1E+00
Antimony Trioxide	1309-64-4							2.8E+04	2.8E+04
Apollo	74115-24-5					1.0E+02	3.8E+02		8.0E+01
Aramite	140-57-8	2.8E+01	9.1E+01	5.4E+05	2.1E+01	3.9E+02	1.5E+03		3.1E+02

TR=1E-06
HQ=0.1

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Arsenic, Inorganic	7440-38-2	7.7E-01	5.1E+00	8.9E+02	6.7E-01	3.9E+00	2.9E+01	2.1E+03	3.4E+00
Arsine	7784-42-1					2.7E-02		7.1E+03	2.7E-02
Assure	76578-14-8					7.0E+01	2.6E+02		5.5E+01
Asulam	3337-71-1					3.9E+02	1.5E+03		3.1E+02
Atrazine	1912-24-9	3.0E+00	9.9E+00		2.3E+00	2.7E+02	1.0E+03		2.2E+02
Auramine	492-80-8	7.9E-01	2.6E+00	1.5E+04	6.1E-01				
Avermectin B1	65195-55-3					3.1E+00	1.2E+01		2.5E+00
Azobenzene	103-33-3	6.3E+00		4.7E+01	5.6E+00				
Azodicarbonamide	123-77-3					7.8E+03	2.9E+04	9.9E+02	8.5E+02
Barium	7440-39-3					1.6E+03		7.1E+04	1.5E+03
Barium Chromate	10294-40-3	3.1E-01		9.2E+00	3.0E-01	1.6E+02		2.8E+04	1.6E+02
Baygon	114-26-1					3.1E+01	1.2E+02		2.5E+01
Bayleton	43121-43-3					2.3E+02	8.7E+02		1.8E+02
Baythroid	68359-37-5					2.0E+02	7.3E+02		1.5E+02
Benefin	1861-40-1					2.3E+03	8.7E+03		1.8E+03
Benomyl	17804-35-2					3.9E+02	1.5E+03		3.1E+02
Bentazon	25057-89-0					2.3E+02	8.7E+02		1.8E+02
Benzaldehyde	100-52-7					7.8E+02			7.8E+02
Benzene	71-43-2	1.3E+01		1.3E+00	1.2E+00	3.1E+01		1.1E+01	8.2E+00
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	7.0E+00	2.3E+01		5.3E+00	2.3E+00	8.7E+00		1.8E+00
Benzenethiol	108-98-5					7.8E+00			7.8E+00
Benzidine	92-87-5	6.7E-04	2.3E-03	2.1E+01	5.2E-04	2.3E+01	8.7E+01		1.8E+01
Benzoic Acid	65-85-0					3.1E+04	1.2E+05		2.5E+04
Benzotrichloride	98-07-7	5.3E-02			5.3E-02				
Benzyl Alcohol	100-51-6					7.8E+02	2.9E+03		6.2E+02
Benzyl Chloride	100-44-7	4.1E+00		1.5E+00	1.1E+00	1.6E+01		2.7E+00	2.3E+00
Beryllium and compounds	7440-41-7			1.6E+03	1.6E+03	1.6E+01		2.8E+03	1.6E+01
Bidrin	141-66-2					7.8E-01	2.9E+00		6.2E-01
Bifenox	42576-02-3					7.0E+01	2.6E+02		5.5E+01
Biphenthrin	82657-04-3					1.2E+02	4.4E+02		9.2E+01
Biphenyl, 1,1'-	92-52-4	8.7E+01			8.7E+01	3.9E+03		4.8E+00	4.7E+00
Bis(2-chloro-1-methylethyl) ether	108-60-1	9.9E+00		9.8E+00	4.9E+00	3.1E+02			3.1E+02
Bis(2-chloroethoxy)methane	111-91-1					2.3E+01	8.7E+01		1.8E+01
Bis(2-chloroethyl)ether	111-44-4	6.3E-01		3.6E-01	2.3E-01				
Bis(chloromethyl)ether	542-88-1	3.2E-03		8.5E-05	8.3E-05				
Bisphenol A	80-05-7					3.9E+02	1.5E+03		3.1E+02
Boron And Borates Only	7440-42-8					1.6E+03		2.8E+06	1.6E+03
Boron Trichloride	10294-34-5					1.6E+04		2.8E+06	1.6E+04
Boron Trifluoride	7637-07-2					3.1E+02		1.8E+06	3.1E+02
Bromate	15541-45-4	9.9E-01			9.9E-01	3.1E+01			3.1E+01
Bromo-2-chloroethane, 1-	107-04-0	3.5E-01		2.8E-02	2.6E-02				
Bromobenzene	108-86-1					6.3E+01		5.2E+01	2.9E+01

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Bromochloromethane	74-97-5							1.5E+01	1.5E+01
Bromodichloromethane	75-27-4	1.1E+01		3.0E-01	2.9E-01	1.6E+02			1.6E+02
Bromoform	75-25-2	8.8E+01	2.9E+02	3.5E+06	6.7E+01	1.6E+02	5.8E+02		1.2E+02
Bromomethane	74-83-9					1.1E+01		7.3E-01	6.8E-01
Bromophos	2104-96-3					3.9E+01	1.5E+02		3.1E+01
Bromoxynil	1689-84-5					1.6E+02	5.8E+02		1.2E+02
Bromoxynil Octanoate	1689-99-2					1.6E+02	5.8E+02		1.2E+02
Butadiene, 1,3-	106-99-0	2.0E-01		8.1E-02	5.8E-02			1.8E-01	1.8E-01
Butanol, N-	71-36-3					7.8E+02	2.9E+03		6.2E+02
Butyl Benzyl Phthlate	85-68-7	3.7E+02	1.2E+03		2.8E+02	1.6E+03	5.8E+03		1.2E+03
Butyl alcohol, sec-	78-92-2					1.6E+04	5.8E+04	4.3E+09	1.2E+04
Butylate	2008-41-5					3.9E+02	1.5E+03		3.1E+02
Butylated hydroxyanisole	25013-16-5	3.5E+03	1.1E+04	6.7E+07	2.7E+03				
Butylated hydroxytoluene	128-37-0	1.9E+02	6.3E+02		1.5E+02	2.3E+03	8.7E+03		1.8E+03
Butylbenzene, n-	104-51-8					3.9E+02			3.9E+02
Butylbenzene, sec-	135-98-8					7.8E+02			7.8E+02
Butylbenzene, tert-	98-06-6					7.8E+02			7.8E+02
Cacodylic Acid	75-60-5					1.6E+02	5.8E+02		1.2E+02
Cadmium (Diet)	7440-43-9			2.1E+03	2.1E+03	7.8E+00	7.3E+01	1.4E+03	7.0E+00
Cadmium (Water)	7440-43-9								
Calcium Chromate	13765-19-0	3.1E-01		9.2E+00	3.0E-01	1.6E+02		2.8E+04	1.6E+02
Caprolactam	105-60-2					3.9E+03	1.5E+04	3.1E+05	3.1E+03
Captafol	2425-06-1	4.6E+00	1.5E+01	8.9E+04	3.6E+00	1.6E+01	5.8E+01		1.2E+01
Captan	133-06-2	3.0E+02	9.9E+02	5.8E+06	2.3E+02	1.0E+03	3.8E+03		8.0E+02
Carbaryl	63-25-2					7.8E+02	2.9E+03		6.2E+02
Carbofuran	1563-66-2					3.9E+01	1.5E+02		3.1E+01
Carbon Disulfide	75-15-0					7.8E+02		8.5E+01	7.7E+01
Carbon Tetrachloride	56-23-5	9.9E+00		7.0E-01	6.5E-01	3.1E+01		1.6E+01	1.0E+01
Carbosulfan	55285-14-8					7.8E+01	2.9E+02		6.2E+01
Carboxin	5234-68-4					7.8E+02	2.9E+03		6.2E+02
Ceric oxide	1306-38-3							1.3E+05	1.3E+05
Chloral Hydrate	302-17-0					7.8E+02	2.9E+03		6.2E+02
Chloramben	133-90-4					1.2E+02	4.4E+02		9.2E+01
Chloranil	118-75-2	1.7E+00	5.6E+00		1.3E+00				
Chlordane	12789-03-6	2.0E+00	1.6E+01	3.8E+04	1.8E+00	3.9E+00	3.6E+01	9.9E+04	3.5E+00
Chlordecone (Kepone)	143-50-0	7.0E-02	2.3E-01	8.3E+02	5.3E-02	2.3E+00	8.7E+00		1.8E+00
Chlorfenvinphos	470-90-6					5.5E+00	2.0E+01		4.3E+00
Chlorimuron, Ethyl-	90982-32-4					1.6E+02	5.8E+02		1.2E+02
Chlorine	7782-50-5					7.8E+02		2.1E+04	7.5E+02
Chlorine Dioxide	10049-04-4					2.3E+02		2.8E+04	2.3E+02
Chlorite (Sodium Salt)	7758-19-2					2.3E+02			2.3E+02
Chloro-1,1-difluoroethane, 1-	75-68-3							5.4E+03	5.4E+03

R=1E-06
HQ=0.1

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Chloro-1,3-butadiene, 2-	126-99-8			1.0E-02	1.0E-02	1.6E+02		2.2E+00	2.2E+00
Chloro-2-methylaniline HCl, 4-	3165-93-3	1.5E+00	4.9E+00		1.2E+00				
Chloro-2-methylaniline, 4-	95-69-2	7.0E+00	2.3E+01	5.0E+04	5.3E+00	2.3E+01	8.7E+01		1.8E+01
Chloroacetaldehyde, 2-	107-20-0	2.6E+00	8.4E+00		2.0E+00				
Chloroacetic Acid	79-11-8					1.6E+01	5.8E+01		1.2E+01
Chloroacetophenone, 2-	532-27-4							4.3E+03	4.3E+03
Chloroaniline, p-	106-47-8	3.5E+00	1.1E+01		2.7E+00	3.1E+01	1.2E+02		2.5E+01
Chlorobenzene	108-90-7					1.6E+02		3.4E+01	2.8E+01
Chlorobenzilate	510-15-6	6.3E+00	2.1E+01	1.2E+05	4.8E+00	1.6E+02	5.8E+02		1.2E+02
Chlorobenzoic Acid, p-	74-11-3					2.3E+02	8.7E+02		1.8E+02
Chlorobenzotrifluoride, 4-	98-56-6					2.3E+01		2.1E+02	2.1E+01
Chlorobutane, 1-	109-69-3					3.1E+02			3.1E+02
Chlorodifluoromethane	75-45-6							4.9E+03	4.9E+03
Chloroethanol, 2-	107-07-3					1.6E+02	5.8E+02		1.2E+02
Chloroform	67-66-3	2.2E+01		3.2E-01	3.2E-01	7.8E+01		2.7E+01	2.0E+01
Chloromethane	74-87-3							1.1E+01	1.1E+01
Chloromethyl Methyl Ether	107-30-2	2.9E-01		2.2E-02	2.0E-02				
Chloronitrobenzene, o-	88-73-3	2.3E+00	7.6E+00		1.8E+00	2.3E+01	8.7E+01	1.4E+03	1.8E+01
Chloronitrobenzene, p-	100-00-5	1.1E+02	3.6E+02		8.5E+01	7.8E+00	2.9E+01	8.5E+04	6.2E+00
Chlorophenol, 2-	95-57-8					3.9E+01			3.9E+01
Chloropicrin	76-06-2							2.0E-01	2.0E-01
Chlorothalonil	1897-45-6	2.2E+02	7.3E+02	4.3E+06	1.7E+02	1.2E+02	4.4E+02		9.2E+01
Chlorotoluene, o-	95-49-8					1.6E+02			1.6E+02
Chlorotoluene, p-	106-43-4					1.6E+02			1.6E+02
Chlorozotocin	54749-90-5	2.9E-03	9.5E-03	5.5E+01	2.2E-03				
Chlorpropham	101-21-3					1.6E+03	5.8E+03		1.2E+03
Chlorpyrifos	2921-88-2					7.8E+00	2.9E+01		6.2E+00
Chlorpyrifos Methyl	5598-13-0					7.8E+01	2.9E+02		6.2E+01
Chlorsulfuron	64902-72-3					3.9E+02	1.5E+03		3.1E+02
Chlorthiophos	60238-56-4					6.3E+00	2.3E+01		4.9E+00
Chromium(III), Insoluble Salts	16065-83-1					1.2E+04			1.2E+04
Chromium(VI)	18540-29-9	3.1E-01		1.6E+01	3.0E-01	2.3E+01		1.4E+04	2.3E+01
Chromium, Total	7440-47-3								
Cobalt	7440-48-4			4.2E+02	4.2E+02	2.3E+00		8.5E+02	2.3E+00
Coke Oven Emissions	8007-45-2								
Copper	7440-50-8					3.1E+02			3.1E+02
Cresol, m-	108-39-4					3.9E+02	1.5E+03	8.5E+07	3.1E+02
Cresol, o-	95-48-7					3.9E+02	1.5E+03	8.5E+07	3.1E+02
Cresol, p-	106-44-5					7.8E+02	2.9E+03	8.5E+07	6.2E+02
Cresol, p-chloro-m-	59-50-7					7.8E+02	2.9E+03		6.2E+02
Cresols	1319-77-3					7.8E+02	2.9E+03	8.5E+07	6.2E+02
Crotonaldehyde, trans-	123-73-9	3.7E-01			3.7E-01	7.8E+00			7.8E+00

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Cumene	98-82-8					7.8E+02		2.6E+02	1.9E+02
Cupferron	135-20-6	3.2E+00	1.0E+01	6.1E+04	2.4E+00				
Cyanazine	21725-46-2	8.3E-01	2.7E+00		6.3E-01	1.6E+01	5.8E+01		1.2E+01
Cyanides									
~Calcium Cyanide	592-01-8					7.8E+00			7.8E+00
~Copper Cyanide	544-92-3					3.9E+01			3.9E+01
~Cyanide (CN-)	57-12-5					4.7E+00		3.9E+00	2.1E+00
~Cyanogen	460-19-5					7.8E+00			7.8E+00
~Cyanogen Bromide	506-68-3					7.0E+02			7.0E+02
~Cyanogen Chloride	506-77-4					3.9E+02			3.9E+02
~Hydrogen Cyanide	74-90-8					4.7E+00		4.4E+00	2.3E+00
~Potassium Cyanide	151-50-8					1.6E+01			1.6E+01
~Potassium Silver Cyanide	506-61-6					3.9E+01			3.9E+01
~Silver Cyanide	506-64-9					7.8E+02			7.8E+02
~Sodium Cyanide	143-33-9					7.8E+00			7.8E+00
~Thiocyanates	NA					1.6E+00			1.6E+00
~Thiocyanic Acid	463-56-9					1.6E+00			1.6E+00
~Zinc Cyanide	557-21-1					3.9E+02			3.9E+02
Cyclohexane	110-82-7							6.5E+02	6.5E+02
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	3.0E+01	9.9E+01		2.3E+01				
Cyclohexanone	108-94-1					3.9E+04	1.5E+05	9.9E+07	3.1E+04
Cyclohexene	110-83-8					3.9E+01		1.4E+02	3.1E+01
Cyclohexylamine	108-91-8					1.6E+03	5.8E+03		1.2E+03
Cyhalothrin/karate	68085-85-8					3.9E+01	1.5E+02		3.1E+01
Cypermethrin	52315-07-8					7.8E+01	2.9E+02		6.2E+01
Cyromazine	66215-27-8					5.9E+01	2.2E+02		4.6E+01
DDD	72-54-8	2.9E+00	9.5E+00	5.5E+04	2.2E+00				
DDE, p,p'-	72-55-9	2.0E+00	6.7E+00	3.9E+04	1.6E+00				
DDT	50-29-3	2.0E+00	2.2E+01	3.9E+04	1.9E+00	3.9E+00	4.8E+01		3.6E+00
Dacthal	1861-32-1					7.8E+01	2.9E+02		6.2E+01
Dalapon	75-99-0					2.3E+02	8.7E+02		1.8E+02
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	9.9E+02	3.3E+03		7.6E+02	5.5E+01	2.0E+02		4.3E+01
Demeton	8065-48-3					3.1E-01	1.2E+00		2.5E-01
Di(2-ethylhexyl)adipate	103-23-1	5.8E+02	1.9E+03		4.4E+02	4.7E+03	1.7E+04		3.7E+03
Diallate	2303-16-4	1.1E+01	3.7E+01		8.7E+00				
Diazinon	333-41-5					5.5E+00	2.0E+01		4.3E+00
Dibenzothiophene	132-65-0					7.8E+01			7.8E+01
Dibromo-3-chloropropane, 1,2-	96-12-8	1.9E-01		5.4E-03	5.3E-03	1.6E+00		6.7E-01	4.7E-01
Dibromobenzene, 1,3-	108-36-1					3.1E+00	1.2E+01		2.5E+00
Dibromobenzene, 1,4-	106-37-6					7.8E+01	2.9E+02		6.2E+01
Dibromochloromethane	124-48-1	8.3E+00	2.7E+01	8.3E-01	7.3E-01	1.6E+02	5.8E+02		1.2E+02
Dibromoethane, 1,2-	106-93-4	3.5E-01		4.0E-02	3.6E-02	7.0E+01		8.1E+00	7.3E+00

TR=1E-06
HQ=0.1

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See PAQ #27); H = HEAST; O = New Jersey; G = EPA Office of Water; T = See PAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1

Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Dibromomethane (Methylene Bromide)	74-95-3					7.8E+01		2.4E+00	2.3E+00
Dibutyltin Compounds	NA					2.3E+00	8.7E+00		1.8E+00
Dicamba	1918-00-9					2.3E+02	8.7E+02		1.8E+02
Dichloro-2-butene, 1,4-	764-41-0			7.4E-03	7.4E-03				
Dichloro-2-butene, cis-1,4-	1476-11-5			7.4E-03	7.4E-03				
Dichloro-2-butene, trans-1,4-	110-57-6			7.4E-03	7.4E-03				
Dichloroacetic Acid	79-43-6	1.4E+01	4.6E+01		1.1E+01	3.1E+01	1.2E+02		2.5E+01
Dichlorobenzene, 1,2-	95-50-1					7.0E+02		2.4E+02	1.8E+02
Dichlorobenzene, 1,4-	106-46-7	1.3E+02		2.7E+00	2.6E+00	5.5E+02		8.7E+02	3.4E+02
Dichlorobenzidine, 3,3'-	91-94-1	1.5E+00	5.1E+00	1.1E+04	1.2E+00				
Dichlorobenzophenone, 4,4'-	90-98-2					7.0E+01	2.6E+02		5.5E+01
Dichlorodifluoromethane	75-71-8					1.6E+03		8.8E+00	8.7E+00
Dichloroethane, 1,1-	75-34-3	1.2E+02		3.7E+00	3.6E+00	1.6E+03			1.6E+03
Dichloroethane, 1,2-	107-06-2	7.6E+00		4.9E-01	4.6E-01	4.7E+01		3.3E+00	3.1E+00
Dichloroethylene, 1,1-	75-35-4					3.9E+02		2.4E+01	2.3E+01
Dichloroethylene, 1,2-cis-	156-59-2					1.6E+01			1.6E+01
Dichloroethylene, 1,2-trans-	156-60-5					1.6E+02			1.6E+02
Dichlorophenol, 2,4-	120-83-2					2.3E+01	8.7E+01		1.8E+01
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7					7.8E+01	5.8E+02		6.9E+01
Dichlorophenoxy)butyric Acid, 4-(2,4-	94-82-6					6.3E+01	2.3E+02		4.9E+01
Dichloropropane, 1,2-	78-87-5	1.9E+01		1.1E+00	1.0E+00	7.0E+02		1.6E+00	1.6E+00
Dichloropropane, 1,3-	142-28-9					1.6E+02			1.6E+02
Dichloropropanol, 2,3-	616-23-9					2.3E+01	8.7E+01		1.8E+01
Dichloropropene, 1,3-	542-75-6	7.0E+00		2.5E+00	1.8E+00	2.3E+02		7.4E+00	7.2E+00
Dichlorvos	62-73-7	2.4E+00	7.8E+00	4.6E+04	1.8E+00	3.9E+00	1.5E+01	7.1E+04	3.1E+00
Dicyclopentadiene	77-73-6					6.3E+02		1.3E-01	1.3E-01
Dieldrin	60-57-1	4.3E-02	1.4E-01	8.3E+02	3.3E-02	3.9E-01	1.5E+00		3.1E-01
Diesel Engine Exhaust	NA								
Diethanolamine	111-42-2					1.6E+01	5.8E+01	2.8E+04	1.2E+01
Diethylene Glycol Monobutyl Ether	112-34-5					2.3E+02	8.7E+02	1.4E+04	1.8E+02
Diethylene Glycol Monoethyl Ether	111-90-0					4.7E+02	1.7E+03	4.3E+04	3.7E+02
Diethylformamide	617-84-5					7.8E+00	2.9E+01		6.2E+00
Diethylstilbestrol	56-53-1	2.0E-03	6.5E-03	3.8E+01	1.5E-03				
Difenzoquat	43222-48-6					6.3E+02	2.3E+03		4.9E+02
Diflubenzuron	35367-38-5					1.6E+02	5.8E+02		1.2E+02
Difluoroethane, 1,1-	75-37-6							4.8E+03	4.8E+03
Dihydrosafrole	94-58-6	1.6E+01	5.2E+01	2.7E-01	2.6E-01				
Diisopropyl Ether	108-20-3							2.2E+02	2.2E+02
Diisopropyl Methylphosphonate	1445-75-6					6.3E+02			6.3E+02
Dimethipin	55290-64-7					1.6E+02	5.8E+02		1.2E+02
Dimethoate	60-51-5					1.6E+00	5.8E+00		1.2E+00
Dimethoxybenzidine, 3,3'-	119-90-4	4.3E-01	1.4E+00		3.3E-01				

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Dimethyl methylphosphonate	756-79-6	4.1E+02	1.3E+03		3.1E+02	4.7E+02	1.7E+03		3.7E+02
Dimethylamino azobenzene [p-]	60-11-7	1.5E-01	4.9E-01	2.9E+03	1.2E-01				
Dimethylaniline HCl, 2,4-	21436-96-4	1.2E+00	3.9E+00		9.2E-01				
Dimethylaniline, 2,4-	95-68-1	3.5E+00	1.1E+01		2.7E+00	1.6E+01	5.8E+01		1.2E+01
Dimethylaniline, N,N-	121-69-7					1.6E+01			1.6E+01
Dimethylbenzidine, 3,3'-	119-93-7	6.3E-02	2.1E-01		4.8E-02				
Dimethylformamide	68-12-2					7.8E+02	2.9E+03	4.3E+06	6.2E+02
Dimethylhydrazine, 1,1-	57-14-7					7.8E-01	2.9E+00	2.8E+02	6.2E-01
Dimethylhydrazine, 1,2-	540-73-8	1.3E-03	4.1E-03	2.4E+01	9.7E-04				
Dimethylphenol, 2,4-	105-67-9					1.6E+02	5.8E+02		1.2E+02
Dimethylphenol, 2,6-	576-26-1					4.7E+00	1.7E+01		3.7E+00
Dimethylphenol, 3,4-	95-65-8					7.8E+00	2.9E+01		6.2E+00
Dimethylvinylchloride	513-37-1	1.5E+01	5.1E+01	2.2E-01	2.1E-01				
Dinitro-o-cresol, 4,6-	534-52-1					6.3E-01	2.3E+00		4.9E-01
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5					1.6E+01	5.8E+01		1.2E+01
Dinitrobenzene, 1,2-	528-29-0					7.8E-01	2.9E+00		6.2E-01
Dinitrobenzene, 1,3-	99-65-0					7.8E-01	2.9E+00		6.2E-01
Dinitrobenzene, 1,4-	100-25-4					7.8E-01	2.9E+00		6.2E-01
Dinitrophenol, 2,4-	51-28-5					1.6E+01	5.8E+01		1.2E+01
Dinitrotoluene Mixture, 2,4/2,6-	NA	1.0E+00	3.3E+00		7.8E-01				
Dinitrotoluene, 2,4-	121-14-2	2.2E+00	7.2E+00	4.3E+04	1.7E+00	1.6E+01	5.7E+01		1.2E+01
Dinitrotoluene, 2,6-	606-20-2	4.6E-01	1.5E+00		3.6E-01	2.3E+00	8.8E+00		1.9E+00
Dinitrotoluene, 2-Amino-4,6-	35572-78-2					1.6E+01	9.7E+02		1.5E+01
Dinitrotoluene, 4-Amino-2,6-	19406-51-0					1.6E+01	6.5E+02		1.5E+01
Dinitrotoluene, Technical grade	25321-14-6	1.5E+00	5.1E+00		1.2E+00	7.0E+00	2.6E+01		5.5E+00
Dinoseb	88-85-7					7.8E+00	2.9E+01		6.2E+00
Dioxane, 1,4-	123-91-1	7.0E+00	2.3E+01	7.6E+05	5.3E+00	2.3E+02	8.7E+02	4.3E+06	1.8E+02
Dioxins									
~Hexachlorodibenzo-p-dioxin, Mixture	NA	1.1E-04	1.2E-03	2.9E+00	1.0E-04				
~TCDD, 2,3,7,8-	1746-01-6	5.3E-06	5.8E-05	1.0E-01	4.9E-06	5.5E-06	6.8E-05	5.7E+00	5.1E-06
Diphenamid	957-51-7					2.3E+02	8.7E+02		1.8E+02
Diphenyl Sulfone	127-63-9					6.3E+00	2.3E+01		4.9E+00
Diphenylamine	122-39-4					2.0E+02	7.3E+02		1.5E+02
Diphenylhydrazine, 1,2-	122-66-7	8.7E-01	2.8E+00	1.7E+04	6.7E-01				
Diquat	85-00-7					1.7E+01	6.4E+01		1.4E+01
Direct Black 38	1937-37-7	9.8E-02	3.2E-01	2.7E+01	7.5E-02				
Direct Blue 6	2602-46-2	9.4E-02	3.1E-01	2.7E+01	7.2E-02				
Direct Brown 95	16071-86-6	1.0E-01	3.4E-01	2.7E+01	7.9E-02				
Disulfoton	298-04-4					3.1E-01	1.2E+00		2.5E-01
Dithiane, 1,4-	505-29-3					7.8E+01	2.9E+02		6.2E+01
Diuron	330-54-1					1.6E+01	5.8E+01		1.2E+01
Dodine	2439-10-3					3.1E+01	1.2E+02		2.5E+01

TR=1E-06
HQ=0.1

Key: T = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See PAQ #27); H = HEAST; O = New Jersey; G = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1

Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
EPTC	759-94-4					2.0E+02			2.0E+02
Endosulfan	115-29-7					4.7E+01	1.7E+02		3.7E+01
Endothall	145-73-3					1.6E+02	5.8E+02		1.2E+02
Endrin	72-20-8					2.3E+00	8.7E+00		1.8E+00
Epichlorohydrin	106-89-8	7.0E+01		4.4E+01	2.7E+01	4.7E+01		2.0E+00	1.9E+00
Epoxybutane, 1,2-	106-88-7							1.6E+01	1.6E+01
Ethephon	16672-87-0					3.9E+01	1.5E+02		3.1E+01
Ethion	563-12-2					3.9E+00	1.5E+01		3.1E+00
Ethoxyethanol Acetate, 2-	111-15-9					7.8E+02	2.9E+03	8.5E+06	6.2E+02
Ethoxyethanol, 2-	110-80-5					7.0E+02	2.6E+03	2.8E+07	5.5E+02
Ethyl Acetate	141-78-6					7.0E+03		6.3E+01	6.2E+01
Ethyl Acrylate	140-88-5	1.4E+01			1.4E+01	3.9E+01		5.3E+00	4.7E+00
Ethyl Chloride (Chloroethane)	75-00-3							1.4E+03	1.4E+03
Ethyl Ether	60-29-7					1.6E+03			1.6E+03
Ethyl Methacrylate	97-63-2					7.0E+02		1.8E+02	1.4E+02
Ethyl-p-nitrophenyl Phosphonate	2104-64-5					7.8E-02	2.9E-01		6.2E-02
Ethylbenzene	100-41-4	6.3E+01		6.4E+00	5.8E+00	7.8E+02		5.9E+02	3.4E+02
Ethylene Cyanohydrin	109-78-4					5.5E+02	2.0E+03		4.3E+02
Ethylene Diamine	107-15-3					7.0E+02	2.6E+03		5.5E+02
Ethylene Glycol	107-21-1					1.6E+04	5.8E+04	5.7E+07	1.2E+04
Ethylene Glycol Monobutyl Ether	111-76-2					7.8E+02	2.9E+03	2.3E+08	6.2E+02
Ethylene Oxide	75-21-8	2.2E+00		1.9E-01	1.8E-01			1.9E+01	1.9E+01
Ethylene Thiourea	96-45-7	1.5E+01	5.1E+01	2.9E+05	1.2E+01	6.3E-01	2.3E+00		4.9E-01
Ethyleneimine	151-56-4	1.1E-02	3.5E-02	3.5E-03	2.5E-03				
Ethylphthalyl Ethyl Glycolate	84-72-0					2.3E+04	8.7E+04		1.8E+04
Express	101200-48-0					6.3E+01	2.3E+02		4.9E+01
Fenamiphos	22224-92-6					2.0E+00	7.3E+00		1.5E+00
Fenpropathrin	39515-41-8					2.0E+02	7.3E+02		1.5E+02
Fluometuron	2164-17-2					1.0E+02	3.8E+02		8.0E+01
Fluoride	16984-48-8					3.1E+02		1.8E+06	3.1E+02
Fluorine (Soluble Fluoride)	7782-41-4					4.7E+02		1.8E+06	4.7E+02
Fluridone	59756-60-4					6.3E+02	2.3E+03		4.9E+02
Flurprimidol	56425-91-3					1.6E+02	5.8E+02		1.2E+02
Flutolanil	66332-96-5					4.7E+02	1.7E+03		3.7E+02
Fluvalinate	69409-94-5					7.8E+01	2.9E+02		6.2E+01
Folpet	133-07-3	2.0E+02	6.5E+02		1.5E+02	7.8E+02	2.9E+03		6.2E+02
Fomesafen	72178-02-0	3.7E+00	1.2E+01		2.8E+00				
Fonofos	944-22-9					1.6E+01	5.8E+01		1.2E+01
Formaldehyde	50-00-0			2.9E+05	2.9E+05	1.6E+03	5.8E+03	1.4E+06	1.2E+03
Formic Acid	64-18-6					7.0E+03	2.6E+04	4.3E+04	4.9E+03
Fosetyl-AL	39148-24-8					2.3E+04	8.7E+04		1.8E+04
Furans									

R-1E-06

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
~Dibenzofuran	132-64-9					7.8E+00	9.7E+01		7.2E+00
~Furan	110-00-9					7.8E+00	9.7E+01		7.2E+00
~Tetrahydrofuran	109-99-9					7.0E+03	8.7E+04	2.5E+03	1.8E+03
Furazolidone	67-45-8	1.8E-01	6.0E-01		1.4E-01				
Furfural	98-01-1					2.3E+01	8.7E+01	7.1E+06	1.8E+01
Furium	531-82-8	4.6E-01	1.5E+00	8.9E+03	3.6E-01				
Furmecyclox	60568-05-0	2.3E+01	7.6E+01	4.4E+05	1.8E+01				
Glufosinate, Ammonium	77182-82-2					3.1E+00	1.2E+01		2.5E+00
Glutaraldehyde	111-30-8							1.1E+04	1.1E+04
Glycidyl	765-34-4					3.1E+00	1.2E+01	1.4E+05	2.5E+00
Glyphosate	1071-83-6					7.8E+02	2.9E+03		6.2E+02
Goal	42874-03-3					2.3E+01	8.7E+01		1.8E+01
Guanidine	113-00-8					7.8E+01	2.9E+02		6.2E+01
Guanidine Chloride	50-01-1					1.6E+02	5.8E+02		1.2E+02
Guthion	86-50-0					2.3E+01	8.7E+01	1.4E+06	1.8E+01
Haloxyfop, Methyl	69806-40-2					3.9E-01	1.5E+00		3.1E-01
Harmony	79277-27-3					1.0E+02	3.8E+02		8.0E+01
Heptachlor	76-44-8	1.5E-01	5.1E-01	2.9E+03	1.2E-01	3.9E+00	1.5E+01		3.1E+00
Heptachlor Epoxide	1024-57-3	7.6E-02	2.5E-01	1.5E+03	5.9E-02	1.0E-01	3.8E-01		8.0E-02
Hexabromobenzene	87-82-1					1.6E+01	5.8E+01		1.2E+01
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2					1.6E+00	5.8E+00		1.2E+00
Hexachlorobenzene	118-74-1	4.3E-01	1.4E+00	8.3E+03	3.3E-01	6.3E+00	2.3E+01		4.9E+00
Hexachlorobutadiene	87-68-3	8.9E+00	2.9E+01	1.7E+05	6.8E+00	7.8E+00	2.9E+01		6.2E+00
Hexachlorocyclohexane, Alpha-	319-84-6	1.1E-01	3.6E-01	2.1E+03	8.5E-02	6.3E+01	2.3E+02		4.9E+01
Hexachlorocyclohexane, Beta-	319-85-7	3.9E-01	1.3E+00	7.2E+03	3.0E-01				
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	6.3E-01	5.2E+00	1.2E+04	5.6E-01	2.3E+00	2.2E+01		2.1E+00
Hexachlorocyclohexane, Technical	608-73-1	3.9E-01	1.3E+00	7.5E+03	3.0E-01				
Hexachlorocyclopentadiene	77-47-4					4.7E+01	1.7E+02	2.8E+04	3.7E+01
Hexachloroethane	67-72-1	1.7E+01	5.7E+01	3.5E+05	1.3E+01	5.5E+00	2.0E+01	4.3E+06	4.3E+00
Hexachlorophene	70-30-4					2.3E+00	8.7E+00		1.8E+00
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	6.3E+00	1.4E+02		6.0E+00	2.3E+01	5.8E+02		2.3E+01
Hexamethylene Diisocyanate, 1,6-	822-06-0							3.1E-01	3.1E-01
Hexamethylphosphoramide	680-31-9					3.1E+00	1.2E+01		2.5E+00
Hexane, N-	110-54-3					4.7E+02		6.1E+01	5.4E+01
Hexanedioic Acid	124-04-9					1.6E+04	5.8E+04		1.2E+04
Hexanone, 2-	591-78-6					3.9E+01		4.2E+01	2.0E+01
Hexazinone	51235-04-2					2.6E+02	9.6E+02		2.0E+02
Hydrazine	302-01-2	2.3E-01		7.8E+02	2.3E-01			4.3E+03	4.3E+03
Hydrazine Sulfate	10034-93-2	2.3E-01		7.8E+02	2.3E-01				
Hydrogen Chloride	7647-01-0							2.8E+06	2.8E+06
Hydrogen Fluoride	7664-39-3					3.1E+02		2.0E+06	3.1E+02
Hydrogen Sulfide	7783-06-4							2.8E+05	2.8E+05

HQ=0.1

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Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Hydroquinone	123-31-9	1.2E+01	3.8E+01		8.9E+00	3.1E+02	1.2E+03		2.5E+02
Imazalil	35554-44-0					1.0E+02	3.8E+02		8.0E+01
Imazaquin	81335-37-7					2.0E+03	7.3E+03		1.5E+03
Iodine	7553-56-2					7.8E+01			7.8E+01
Iprodione	36734-19-7					3.1E+02	1.2E+03		2.5E+02
Iron	7439-89-6					5.5E+03			5.5E+03
Isobutyl Alcohol	78-83-1					2.3E+03	8.7E+03		1.8E+03
Isophorone	78-59-1	7.3E+02	2.4E+03		5.6E+02	1.6E+03	5.8E+03	2.8E+08	1.2E+03
Isopropalin	33820-53-0					1.2E+02	4.4E+02		9.2E+01
Isopropanol	67-63-0					1.6E+04	5.8E+04	2.8E+07	1.2E+04
Isopropyl Methyl Phosphonic Acid	1832-54-8					7.8E+02	2.9E+03		6.2E+02
Isoxaben	82558-50-7					3.9E+02	1.5E+03		3.1E+02
JP-7	NA							4.3E+07	4.3E+07
Kerb	23950-58-5					5.9E+02	2.2E+03		4.6E+02
Lactofen	77501-63-4					1.6E+01	5.8E+01		1.2E+01
Lead Compounds									
~Lead Chromate	7758-97-6	3.1E-01		9.2E+00	3.0E-01	1.6E+02		2.8E+04	1.6E+02
~Lead Phosphate	7446-27-7	8.2E+01		3.2E+05	8.2E+01				
~Lead acetate	301-04-2	2.5E+00	8.1E+00	4.8E+04	1.9E+00				
~Lead and Compounds	7439-92-1								4.0E+02
~Lead subacetate	1335-32-6	8.2E+01	2.7E+02	3.2E+05	6.3E+01				
~Tetraethyl Lead	78-00-2					7.8E-04	2.9E-03		6.2E-04
Linuron	330-55-2					1.6E+01	5.8E+01		1.2E+01
Lithium	7439-93-2					1.6E+01			1.6E+01
Londax	83055-99-6					1.6E+03	5.8E+03		1.2E+03
MCPA	94-74-6					3.9E+00	1.5E+01		3.1E+00
MCPB	94-81-5					7.8E+01	2.9E+02		6.2E+01
MCPP	93-65-2					7.8E+00	2.9E+01		6.2E+00
Malathion	121-75-5					1.6E+02	5.8E+02		1.2E+02
Maleic Anhydride	108-31-6					7.8E+02	2.9E+03	9.9E+04	6.1E+02
Maleic Hydrazide	123-33-1					3.9E+03	1.5E+04		3.1E+03
Malononitrile	109-77-3					7.8E-01	2.9E+00		6.2E-01
Mancozeb	8018-01-7					2.3E+02	8.7E+02		1.8E+02
Maneb	12427-38-2					3.9E+01	1.5E+02		3.1E+01
Manganese (Diet)	7439-96-5								
Manganese (Non-diet)	7439-96-5					1.9E+02		7.1E+03	1.8E+02
Mephosfolan	950-10-7					7.0E-01	2.6E+00		5.5E-01
Mepiquat Chloride	24307-26-4					2.3E+02	8.7E+02		1.8E+02
Mercury Compounds									
~Mercuric Chloride (and other Mercury salts)	7487-94-7					2.3E+00		4.3E+04	2.3E+00
~Mercury (elemental)	7439-97-6							9.4E-01	9.4E-01
~Methyl Mercury	22967-92-6					7.8E-01			7.8E-01

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
~Phenylmercuric Acetate	62-38-4					6.3E-01	2.3E+00		4.9E-01
Merphos	150-50-5					2.3E-01	8.7E-01		1.8E-01
Merphos Oxide	78-48-8					2.3E-01	8.7E-01		1.8E-01
Metalaxyl	57837-19-1					4.7E+02	1.7E+03		3.7E+02
Methacrylonitrile	126-98-7					7.8E-01		2.1E+01	7.5E-01
Methamidophos	10265-92-6					3.9E-01	1.5E+00		3.1E-01
Methanol	67-56-1					1.6E+04	5.8E+04	2.8E+09	1.2E+04
Methidathion	950-37-8					7.8E+00	2.9E+01		6.2E+00
Methomyl	16752-77-5					2.0E+02	7.3E+02		1.5E+02
Methoxy-5-nitroaniline, 2-	99-59-2	1.4E+01	4.6E+01	2.7E+05	1.1E+01				
Methoxychlor	72-43-5					3.9E+01	1.5E+02		3.1E+01
Methoxyethanol Acetate, 2-	110-49-6					6.3E+01	2.3E+02	1.4E+05	4.9E+01
Methoxyethanol, 2-	109-86-4					3.9E+01	1.5E+02	2.8E+06	3.1E+01
Methyl Acetate	79-20-9					7.8E+03			7.8E+03
Methyl Acrylate	96-33-3					2.3E+02		1.5E+01	1.4E+01
Methyl Ethyl Ketone (2-Butanone)	78-93-3					4.7E+03		6.4E+03	2.7E+03
Methyl Hydrazine	60-34-4			3.8E+03	3.8E+03	7.8E+00	2.9E+01	2.8E+03	6.2E+00
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1					6.3E+02		3.3E+03	5.3E+02
Methyl Isocyanate	624-83-9							4.6E-01	4.6E-01
Methyl Methacrylate	80-62-6					1.1E+04		4.6E+02	4.4E+02
Methyl Parathion	298-00-0					2.0E+00	7.3E+00		1.5E+00
Methyl Phosphonic Acid	993-13-5					4.7E+02	1.7E+03		3.7E+02
Methyl Styrene (Mixed Isomers)	25013-15-4					4.7E+01		4.4E+01	2.3E+01
Methyl methanesulfonate	66-27-3	7.0E+00	2.3E+01	1.4E+05	5.4E+00				
Methyl tert-Butyl Ether (MTBE)	1634-04-4	3.9E+02		5.3E+01	4.7E+01			1.5E+03	1.5E+03
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2					2.3E+00	8.7E+00		1.8E+00
Methyl-5-Nitroaniline, 2-	99-55-8	7.7E+01	2.5E+02		5.9E+01	1.6E+02	5.8E+02		1.2E+02
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	8.4E-02	2.7E-01	1.6E+03	6.4E-02				
Methylaniline Hydrochloride, 2-	636-21-5	5.3E+00	1.8E+01	1.0E+05	4.1E+00				
Methylarsonic acid	124-58-3					7.8E+01	2.9E+02		6.2E+01
Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7					1.6E+00	5.8E+00		1.2E+00
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	7.0E+00	2.3E+01		5.3E+00	2.3E+00	8.7E+00		1.8E+00
Methylcholanthrene, 3-	56-49-5	7.0E-03	2.4E-02	2.2E+02	5.4E-03				
Methylene Chloride	75-09-2	7.7E+01		2.2E+02	5.7E+01	4.7E+01		1.4E+02	3.5E+01
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	1.5E+00	5.4E+00	3.2E+03	1.2E+00	1.6E+01	5.8E+01		1.2E+01
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	1.5E+01	4.9E+01	2.9E+05	1.2E+01				
Methylenebisbenzenamine, 4,4'-	101-77-9	4.3E-01	1.4E+00	8.3E+03	3.3E-01			2.8E+06	2.8E+06
Methylenediphenyl Diisocyanate	101-68-8							8.5E+04	8.5E+04
Methylstyrene, Alpha-	98-83-9					5.5E+02			5.5E+02
Metolachlor	51218-45-2					1.2E+03	4.4E+03		9.2E+02
Metribuzin	21087-64-9					2.0E+02	7.3E+02		1.5E+02
Mineral oils	8012-95-1					2.3E+04	8.7E+04		1.8E+04

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Mirex	2385-85-5	3.9E-02	1.3E-01	7.5E+02	3.0E-02	1.6E+00	5.8E+00		1.2E+00
Molinate	2212-67-1					1.6E+01	5.8E+01		1.2E+01
Molybdenum	7439-98-7					3.9E+01			3.9E+01
Monochloramine	10599-90-3					7.8E+02			7.8E+02
Monomethylaniline	100-61-8					1.6E+01	5.8E+01		1.2E+01
N,N'-Diphenyl-1,4-benzenediamine	74-31-7					2.3E+00	8.7E+00		1.8E+00
Naled	300-76-5					1.6E+01	5.8E+01		1.2E+01
Naphtha, High Flash Aromatic (HFAN)	64742-95-6					2.3E+02		1.4E+07	2.3E+02
Naphthylamine, 2-	91-59-8	3.9E-01	1.3E+00		3.0E-01				
Napropamide	15299-99-7					7.8E+02	2.9E+03		6.2E+02
Nickel Acetate	373-02-4			1.5E+04	1.5E+04	8.6E+01		2.0E+03	8.2E+01
Nickel Carbonate	3333-67-3			1.5E+04	1.5E+04	8.6E+01		2.0E+03	8.2E+01
Nickel Carbonyl	13463-39-3			1.5E+04	1.5E+04	8.6E+01		2.0E+03	8.2E+01
Nickel Hydroxide	12054-48-7			1.5E+04	1.5E+04	8.6E+01		2.0E+03	8.2E+01
Nickel Oxide	1313-99-1			1.5E+04	1.5E+04	8.6E+01		2.8E+03	8.4E+01
Nickel Refinery Dust	NA			1.6E+04	1.6E+04	8.6E+01		2.0E+03	8.2E+01
Nickel Soluble Salts	7440-02-0			1.5E+04	1.5E+04	1.6E+02		1.3E+04	1.5E+02
Nickel Subsulfide	12035-72-2	4.1E-01		8.0E+03	4.1E-01	8.6E+01		2.0E+03	8.2E+01
Nickelocene	1271-28-9			1.5E+04	1.5E+04	8.6E+01		2.0E+03	8.2E+01
Nitrate	14797-55-8					1.3E+04			1.3E+04
Nitrate + Nitrite (as N)	NA								
Nitrite	14797-65-0					7.8E+02			7.8E+02
Nitroaniline, 2-	88-74-4					7.8E+01	2.9E+02	7.1E+03	6.1E+01
Nitroaniline, 4-	100-01-6	3.5E+01	1.1E+02		2.7E+01	3.1E+01	1.2E+02	8.5E+05	2.5E+01
Nitrobenzene	98-95-3			5.1E+00	5.1E+00	1.6E+01		6.9E+01	1.3E+01
Nitrocellulose	9004-70-0					2.3E+07	8.7E+07		1.8E+07
Nitrofurantoin	67-20-9					5.5E+02	2.0E+03		4.3E+02
Nitrofurazone	59-87-0	5.3E-01	1.8E+00	1.0E+04	4.1E-01				
Nitroglycerin	55-63-0	4.1E+01	1.3E+02		3.1E+01	7.8E-01	2.9E+00		6.2E-01
Nitroguanidine	556-88-7					7.8E+02	2.9E+03		6.2E+02
Nitromethane	75-52-5			5.4E+00	5.4E+00			8.8E+00	8.8E+00
Nitropropane, 2-	79-46-9			1.4E-02	1.4E-02			2.7E+01	2.7E+01
Nitroso-N-ethylurea, N-	759-73-9	5.7E-03	2.0E-02	1.8E+02	4.4E-03				
Nitroso-N-methylurea, N-	684-93-5	1.3E-03	4.5E-03	4.1E+01	9.9E-04				
Nitroso-di-N-butylamine, N-	924-16-3	1.3E-01		3.5E-01	9.4E-02				
Nitroso-di-N-propylamine, N-	621-64-7	9.9E-02	3.3E-01	1.9E+03	7.6E-02				
Nitrosodiethanolamine, N-	1116-54-7	2.5E-01	8.1E-01	4.8E+03	1.9E-01				
Nitrosodiethylamine, N-	55-18-5	1.0E-03	3.6E-03	3.2E+01	7.9E-04				
Nitrosodimethylamine, N-	62-75-9	3.0E-03	1.1E-02	9.8E+01	2.3E-03	6.3E-02	2.3E-01	5.7E+03	4.9E-02
Nitrosodiphenylamine, N-	86-30-6	1.4E+02	4.6E+02	1.5E+06	1.1E+02				
Nitrosomethylethylamine, N-	10595-95-6	3.2E-02	1.0E-01	6.1E+02	2.4E-02				
Nitrosomorpholine [N-]	59-89-2	1.0E-01	3.4E-01	2.0E+03	7.9E-02				

TR=1E-06
HQ=0.1

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Nitrosopiperidine [N-]	100-75-4	7.4E-02	2.4E-01	1.4E+03	5.7E-02				
Nitrosopyrrolidine, N-	930-55-2	3.3E-01	1.1E+00	6.3E+03	2.5E-01				
Nitrotoluene, m-	99-08-1					7.8E-01	2.9E+00		6.2E-01
Nitrotoluene, o-	88-72-2	3.2E+00			3.2E+00	7.0E+00			7.0E+00
Nitrotoluene, p-	99-99-0	4.3E+01	1.4E+02		3.3E+01	3.1E+01	1.2E+02		2.5E+01
Nonane, n-	111-84-2					2.3E+00		2.2E+00	1.1E+00
Norflurazon	27314-13-2					3.1E+02	1.2E+03		2.5E+02
Nustar	85509-19-9					5.5E+00	2.0E+01		4.3E+00
Octabromodiphenyl Ether	32536-52-0					2.3E+01	8.7E+01		1.8E+01
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0					3.9E+02	2.4E+04		3.8E+02
Octamethylpyrophosphoramide	152-16-9					1.6E+01	5.8E+01		1.2E+01
Oryzalin	19044-88-3					3.9E+02	1.5E+03		3.1E+02
Oxadiazon	19666-30-9					3.9E+01	1.5E+02		3.1E+01
Oxamyl	23135-22-0					2.0E+02	7.3E+02		1.5E+02
Paclobutrazol	76738-62-0					1.0E+02	3.8E+02		8.0E+01
Paraquat Dichloride	1910-42-5					3.5E+01	1.3E+02		2.8E+01
Parathion	56-38-2					4.7E+01	1.7E+02		3.7E+01
Pebulate	1114-71-2					3.9E+02	1.5E+03		3.1E+02
Pendimethalin	40487-42-1					3.1E+02	1.2E+03		2.5E+02
Pentabromodiphenyl Ether	32534-81-9					1.6E+01	5.8E+01		1.2E+01
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9					7.8E-01	2.9E+00		6.2E-01
Pentachlorobenzene	608-93-5					6.3E+00	2.3E+01		4.9E+00
Pentachloroethane	76-01-7	7.7E+00	2.5E+01		5.9E+00				
Pentachloronitrobenzene	82-68-8	2.7E+00	8.8E+00		2.0E+00	2.3E+01	8.7E+01		1.8E+01
Pentachlorophenol	87-86-5	1.7E+00	2.3E+00	7.5E+05	9.9E-01	3.9E+01	5.8E+01		2.3E+01
Pentaerythritol tetranitrate (PETN)	78-11-5	1.7E+02	5.7E+02		1.3E+02	1.6E+01	5.8E+01		1.2E+01
Pentane, n-	109-66-0							8.1E+01	8.1E+01
Perchlorates									
~Ammonium Perchlorate	7790-98-9					5.5E+00			5.5E+00
~Lithium Perchlorate	7791-03-9					5.5E+00			5.5E+00
~Perchlorate and Perchlorate Salts	14797-73-0					5.5E+00			5.5E+00
~Potassium Perchlorate	7778-74-7					5.5E+00			5.5E+00
~Sodium Perchlorate	7601-89-0					5.5E+00			5.5E+00
Perfluorobutane Sulfonate	375-73-5					1.6E+02	5.8E+02		1.2E+02
Permethrin	52645-53-1					3.9E+02	1.5E+03		3.1E+02
Phenacetin	62-44-2	3.2E+02	1.0E+03	6.1E+06	2.4E+02				
Phenmedipham	13684-63-4					2.0E+03	7.3E+03		1.5E+03
Phenol	108-95-2					2.3E+03	8.7E+03	2.8E+07	1.8E+03
Phenothiazine	92-84-2					3.9E+00	1.5E+01		3.1E+00
Phenylenediamine, m-	108-45-2					4.7E+01	1.7E+02		3.7E+01
Phenylenediamine, o-	95-54-5	1.5E+01	4.8E+01		1.1E+01				
Phenylenediamine, p-	106-50-3					1.5E+03	5.5E+03		1.2E+03

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Phenylphenol, 2-	90-43-7	3.6E+02	1.2E+03		2.7E+02				
Phorate	298-02-2					1.6E+00	5.8E+00		1.2E+00
Phosgene	75-44-5							3.1E-02	3.1E-02
Phosmet	732-11-6					1.6E+02	5.8E+02		1.2E+02
Phosphates, Inorganic									
~Aluminum metaphosphate	13776-88-0					3.8E+05			3.8E+05
~Ammonium polyphosphate	68333-79-9					3.8E+05			3.8E+05
~Calcium pyrophosphate	7790-76-3					3.8E+05			3.8E+05
~Diammonium phosphate	7783-28-0					3.8E+05			3.8E+05
~Dicalcium phosphate	7757-93-9					3.8E+05			3.8E+05
~Dimagnesium phosphate	7782-75-4					3.8E+05			3.8E+05
~Dipotassium phosphate	7758-11-4					3.8E+05			3.8E+05
~Disodium phosphate	7558-79-4					3.8E+05			3.8E+05
~Monoaluminum phosphate	13530-50-2					3.8E+05			3.8E+05
~Monoammonium phosphate	7722-76-1					3.8E+05			3.8E+05
~Monocalcium phosphate	7758-23-8					3.8E+05			3.8E+05
~Monomagnesium phosphate	7757-86-0					3.8E+05			3.8E+05
~Monopotassium phosphate	7778-77-0					3.8E+05			3.8E+05
~Monosodium phosphate	7558-80-7					3.8E+05			3.8E+05
~Polyphosphoric acid	8017-16-1					3.8E+05			3.8E+05
~Potassium tripolyphosphate	13845-36-8					3.8E+05			3.8E+05
~Sodium acid pyrophosphate	7758-16-9					3.8E+05			3.8E+05
~Sodium aluminum phosphate (acidic)	7785-88-8					3.8E+05			3.8E+05
~Sodium aluminum phosphate (anhydrous)	10279-59-1					3.8E+05			3.8E+05
~Sodium aluminum phosphate (tetrahydrate)	10305-76-7					3.8E+05			3.8E+05
~Sodium hexametaphosphate	10124-56-8					3.8E+05			3.8E+05
~Sodium polyphosphate	68915-31-1					3.8E+05			3.8E+05
~Sodium trimetaphosphate	7785-84-4					3.8E+05			3.8E+05
~Sodium tripolyphosphate	7758-29-4					3.8E+05			3.8E+05
~Tetrapotassium phosphate	7320-34-5					3.8E+05			3.8E+05
~Tetrasodium pyrophosphate	7722-88-5					3.8E+05			3.8E+05
~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5					3.8E+05			3.8E+05
~Tricalcium phosphate	7758-87-4					3.8E+05			3.8E+05
~Trimagnesium phosphate	7757-87-1					3.8E+05			3.8E+05
~Tripotassium phosphate	7778-53-2					3.8E+05			3.8E+05
~Trisodium phosphate	7601-54-9					3.8E+05			3.8E+05
Phosphine	7803-51-2					2.3E+00		4.3E+04	2.3E+00
Phosphoric Acid	7664-38-2					3.8E+05		1.4E+06	3.0E+05
Phosphorus, White	7723-14-0					1.6E-01			1.6E-01
Phthalates									
~Bis(2-ethylhexyl)phthalate	117-81-7	5.0E+01	1.6E+02	1.6E+06	3.8E+01	1.6E+02	5.8E+02		1.2E+02
~Butylphthalyl Butylglycolate	85-70-1					7.8E+03	2.9E+04		6.2E+03

TR=1E-06
HQ=0.1

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
~Dibutyl Phthalate	84-74-2					7.8E+02	2.9E+03		6.2E+02
~Diethyl Phthalate	84-66-2					6.3E+03	2.3E+04		4.9E+03
~Dimethylterephthalate	120-61-6					7.8E+02			7.8E+02
~Octyl Phthalate, di-N-	117-84-0					7.8E+01	2.9E+02		6.2E+01
~Phthalic Acid, P-	100-21-0					7.8E+03	2.9E+04		6.2E+03
~Phthalic Anhydride	85-44-9					1.6E+04	5.8E+04	2.8E+06	1.2E+04
Picloram	1918-02-1					5.5E+02	2.0E+03		4.3E+02
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3					7.8E-01	2.9E+00		6.2E-01
Pirimiphos, Methyl	29232-93-7					7.8E+01	2.9E+02		6.2E+01
Polybrominated Biphenyls	59536-65-1	2.3E-02	7.6E-02	4.4E+02	1.8E-02	5.5E-02	2.0E-01		4.3E-02
Polychlorinated Biphenyls (PCBs)									
~Aroclor 1016	12674-11-2	9.9E+00	2.3E+01	1.9E+05	7.0E+00	5.5E-01	1.5E+00		4.0E-01
~Aroclor 1221	11104-28-2	3.5E-01	8.1E-01	4.2E-01	1.5E-01				
~Aroclor 1232	11141-16-5	3.5E-01	8.1E-01	4.2E-01	1.5E-01				
~Aroclor 1242	53469-21-9	3.5E-01	8.1E-01	6.7E+03	2.4E-01				
~Aroclor 1248	12672-29-6	3.5E-01	8.1E-01	6.7E+03	2.4E-01				
~Aroclor 1254	11097-69-1	3.5E-01	8.1E-01	6.7E+03	2.4E-01	1.6E-01	4.2E-01		1.1E-01
~Aroclor 1260	11096-82-5	3.5E-01	8.1E-01	6.7E+03	2.4E-01				
~Aroclor 5460	11126-42-4					4.7E+00	1.7E+01		3.7E+00
~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.8E-04	4.2E-04	3.3E+00	1.2E-04	1.8E-04	4.8E-04	1.9E+02	1.3E-04
~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.8E-01	4.2E-01	3.3E+03	1.2E-01	1.8E-01	4.8E-01	1.9E+05	1.3E-01
~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	5.3E-05	1.3E-04	1.0E+00	3.7E-05	5.5E-05	1.5E-04	5.7E+01	4.0E-05
~Polychlorinated Biphenyls (high risk)	1336-36-3	3.5E-01	8.1E-01	6.7E+03	2.4E-01				
~Polychlorinated Biphenyls (low risk)	1336-36-3								
~Polychlorinated Biphenyls (lowest risk)	1336-36-3								
~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	5.3E-02	1.3E-01	1.0E+03	3.7E-02	5.5E-02	1.5E-01	5.7E+04	4.0E-02
~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.8E-02	4.2E-02	3.3E+02	1.2E-02	1.8E-02	4.8E-02	1.9E+04	1.3E-02
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9							8.5E+04	8.5E+04
Polynuclear Aromatic Hydrocarbons (PAHs)									
~Acenaphthene	83-32-9					4.7E+02	1.3E+03		3.5E+02
~Anthracene	120-12-7					2.3E+03	6.7E+03		1.7E+03
~Benz[a]anthracene	56-55-3	2.1E-01	5.7E-01	1.3E+04	1.5E-01				
~Benzo(j)fluoranthene	205-82-3	5.8E-01	1.5E+00	3.5E+04	4.1E-01				
~Benzo[a]pyrene	50-32-8	2.1E-02	5.7E-02	1.3E+03	1.5E-02				
~Benzo[b]fluoranthene	205-99-2	2.1E-01	5.7E-01	1.3E+04	1.5E-01				

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TR=1E-06
HQ=0.1

Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
~Benzo[k]fluoranthene	207-08-9	2.1E+00	5.7E+00	1.3E+04	1.5E+00				
~Chloronaphthalene, Beta-	91-58-7					6.3E+02			6.3E+02
~Chrysene	218-01-9	2.1E+01	5.7E+01	1.3E+05	1.5E+01				
~Dibenz[a,h]anthracene	53-70-3	2.1E-02	5.7E-02	1.1E+03	1.5E-02				
~Dibenzo(a,e)pyrene	192-65-4	5.8E-02	1.5E-01	3.5E+03	4.1E-02				
~Dimethylbenz(a)anthracene, 7,12-	57-97-6	6.1E-04	1.7E-03	1.9E+01	4.5E-04				
~Fluoranthene	206-44-0					3.1E+02	8.9E+02		2.3E+02
~Fluorene	86-73-7					3.1E+02	8.9E+02		2.3E+02
~Indeno[1,2,3-cd]pyrene	193-39-5	2.1E-01	5.7E-01	1.3E+04	1.5E-01				
~Methylnaphthalene, 1-	90-12-0	2.4E+01	6.0E+01		1.7E+01	5.5E+02	1.6E+03		4.1E+02
~Methylnaphthalene, 2-	91-57-6					3.1E+01	8.9E+01		2.3E+01
~Naphthalene	91-20-3			3.8E+00	3.8E+00	1.6E+02	4.5E+02	1.4E+01	1.3E+01
~Nitropyrene, 4-	57835-92-4	5.8E-01	1.5E+00	3.5E+04	4.1E-01				
~Pyrene	129-00-0					2.3E+02	6.7E+02		1.7E+02
Potassium Perfluorobutane Sulfonate	29420-49-3					1.6E+02	5.8E+02		1.2E+02
Prochloraz	67747-09-5	4.6E+00	1.5E+01		3.6E+00	7.0E+01	2.6E+02		5.5E+01
Profluralin	26399-36-0					4.7E+01	1.7E+02		3.7E+01
Prometon	1610-18-0					1.2E+02	4.4E+02		9.2E+01
Prometryn	7287-19-6					3.1E+01	1.2E+02		2.5E+01
Propachlor	1918-16-7					1.0E+02	3.8E+02		8.0E+01
Propanil	709-98-8					3.9E+01	1.5E+02		3.1E+01
Propargite	2312-35-8					1.6E+02	5.8E+02		1.2E+02
Propargyl Alcohol	107-19-7					1.6E+01	5.8E+01		1.2E+01
Propazine	139-40-2					1.6E+02	5.8E+02		1.2E+02
Propham	122-42-9					1.6E+02	5.8E+02		1.2E+02
Propiconazole	60207-90-1					1.0E+02	3.8E+02		8.0E+01
Propionaldehyde	123-38-6							7.5E+00	7.5E+00
Propyl benzene	103-65-1					7.8E+02	2.9E+03	7.3E+02	3.3E+02
Propylene	115-07-1							2.2E+02	2.2E+02
Propylene Glycol	57-55-6					1.6E+05	5.8E+05		1.2E+05
Propylene Glycol Dinitrate	6423-43-4							3.9E+04	3.9E+04
Propylene Glycol Monoethyl Ether	1569-02-4					5.5E+03	2.0E+04		4.3E+03
Propylene Glycol Monomethyl Ether	107-98-2					5.5E+03	2.0E+04	2.8E+08	4.3E+03
Propylene Oxide	75-56-9	2.9E+00		7.8E+00	2.1E+00			3.2E+01	3.2E+01
Pursuit	81335-77-5					2.0E+03	7.3E+03		1.5E+03
Pydrin	51630-58-1					2.0E+02	7.3E+02		1.5E+02
Pyridine	110-86-1					7.8E+00			7.8E+00
Quinalphos	13593-03-8					3.9E+00	1.5E+01		3.1E+00
Quinoline	91-22-5	2.3E-01	7.6E-01		1.8E-01				
Refractory Ceramic Fibers	NA							4.3E+06	4.3E+06
Resmethrin	10453-86-8					2.3E+02	8.7E+02		1.8E+02
Ronnel	299-84-3					3.9E+02	1.5E+03		3.1E+02

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Rotenone	83-79-4					3.1E+01	1.2E+02		2.5E+01
Safrole	94-59-7	7.0E-01	2.4E+00	2.2E+04	5.4E-01				
Savey	78587-05-0					2.0E+02	7.3E+02		1.5E+02
Selenious Acid	7783-00-8					3.9E+01			3.9E+01
Selenium	7782-49-2					3.9E+01		2.8E+06	3.9E+01
Selenium Sulfide	7446-34-6					3.9E+01		2.8E+06	3.9E+01
Sethoxydim	74051-80-2					7.0E+02	2.6E+03		5.5E+02
Silica (crystalline, respirable)	7631-86-9							4.3E+05	4.3E+05
Silver	7440-22-4					3.9E+01			3.9E+01
Simazine	122-34-9	5.8E+00	1.9E+01		4.4E+00	3.9E+01	1.5E+02		3.1E+01
Sodium Acifluorfen	62476-59-9					1.0E+02	3.8E+02		8.0E+01
Sodium Azide	26628-22-8					3.1E+01			3.1E+01
Sodium Dichromate	10588-01-9	3.1E-01		9.2E+00	3.0E-01	1.6E+02		2.8E+04	1.6E+02
Sodium Diethyldithiocarbamate	148-18-5	2.6E+00	8.4E+00		2.0E+00	2.3E+02	8.7E+02		1.8E+02
Sodium Fluoride	7681-49-4					3.9E+02		1.8E+06	3.9E+02
Sodium Fluoroacetate	62-74-8					1.6E-01	5.8E-01		1.2E-01
Sodium Metavanadate	13718-26-8					7.8E+00			7.8E+00
Stirofos (Tetrachlorovinphos)	961-11-5	2.9E+01	9.5E+01		2.2E+01	2.3E+02	8.7E+02		1.8E+02
Strontium Chromate	7789-06-2	3.1E-01		9.2E+00	3.0E-01	1.6E+02		2.8E+04	1.6E+02
Strontium, Stable	7440-24-6					4.7E+03			4.7E+03
Strychnine	57-24-9					2.3E+00	8.7E+00		1.8E+00
Styrene	100-42-5					1.6E+03		9.7E+02	6.0E+02
Styrene-Acrylonitrile (SAN) Trimer	NA					2.3E+01	8.7E+01		1.8E+01
Sulfolane	126-33-0					7.8E+00	2.9E+01	2.8E+05	6.2E+00
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9					6.3E+00	2.3E+01		4.9E+00
Sulfur Trioxide	7446-11-9							1.4E+05	1.4E+05
Sulfuric Acid	7664-93-9							1.4E+05	1.4E+05
Systhane	88671-89-0					2.0E+02	7.3E+02		1.5E+02
TCMTB	21564-17-0					2.3E+02	8.7E+02		1.8E+02
Tebuthiuron	34014-18-1					5.5E+02	2.0E+03		4.3E+02
Temephos	3383-96-8					1.6E+02	5.8E+02		1.2E+02
Terbacil	5902-51-2					1.0E+02	3.8E+02		8.0E+01
Terbufos	13071-79-9					2.0E-01	7.3E-01		1.5E-01
Terbutryn	886-50-0					7.8E+00	2.9E+01		6.2E+00
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1					7.8E-01	2.9E+00		6.2E-01
Tetrachlorobenzene, 1,2,4,5-	95-94-3					2.3E+00	8.7E+00		1.8E+00
Tetrachloroethane, 1,1,1,2-	630-20-6	2.7E+01		2.2E+00	2.0E+00	2.3E+02			2.3E+02
Tetrachloroethane, 1,1,2,2-	79-34-5	3.5E+00		7.3E-01	6.0E-01	1.6E+02			1.6E+02
Tetrachloroethylene	127-18-4	3.3E+02		2.5E+01	2.4E+01	4.7E+01		9.8E+00	8.1E+00
Tetrachlorophenol, 2,3,4,6-	58-90-2					2.3E+02	8.7E+02		1.8E+02
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	3.5E-02	1.1E-01		2.7E-02				
Tetraethyl Dithiopyrophosphate	3689-24-5					3.9E+00	1.5E+01		3.1E+00

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Tetrafluoroethane, 1,1,1,2-	811-97-2							1.0E+04	1.0E+04
Tetryl (Trinitrophenylmethylnitramine)	479-45-8					1.6E+01	5.8E+01		1.2E+01
Thallium (I) Nitrate	10102-45-1					5.5E-02			5.5E-02
Thallium (Soluble Salts)	7440-28-0					7.8E-02			7.8E-02
Thallium Acetate	563-68-8					4.7E-02			4.7E-02
Thallium Carbonate	6533-73-9					1.6E-01			1.6E-01
Thallium Chloride	7791-12-0					4.7E-02			4.7E-02
Thallium Sulfate	7446-18-6					1.6E-01			1.6E-01
Thiobencarb	28249-77-6					7.8E+01	2.9E+02		6.2E+01
Thiodiglycol	111-48-8					5.5E+02	2.7E+04		5.4E+02
Thiofanox	39196-18-4					2.3E+00	8.7E+00		1.8E+00
Thiophanate, Methyl	23564-05-8					6.3E+02	2.3E+03		4.9E+02
Thiram	137-26-8					3.9E+01	1.5E+02		3.1E+01
Tin	7440-31-5					4.7E+03			4.7E+03
Titanium Tetrachloride	7550-45-0							1.4E+04	1.4E+04
Toluene	108-88-3					6.3E+02		2.2E+03	4.9E+02
Toluene-2,5-diamine	95-70-5	3.9E+00	1.3E+01		3.0E+00	1.6E+00	5.8E+00		1.2E+00
Toluidine, p-	106-49-0	2.3E+01	7.6E+01		1.8E+01	3.1E+01	1.2E+02		2.5E+01
Total Petroleum Hydrocarbons (Aliphatic High)	NA					2.3E+04			2.3E+04
Total Petroleum Hydrocarbons (Aliphatic Low)	NA							5.2E+01	5.2E+01
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA					7.8E+01		1.1E+01	9.6E+00
Total Petroleum Hydrocarbons (Aromatic High)	NA					3.1E+02	1.2E+03		2.5E+02
Total Petroleum Hydrocarbons (Aromatic Low)	NA					3.1E+01		1.1E+01	8.2E+00
Total Petroleum Hydrocarbons (Aromatic Medium)	NA					3.1E+01		1.6E+01	1.1E+01
Toxaphene	8001-35-2	6.3E-01	2.1E+00	1.2E+04	4.8E-01				
Tralomethrin	66841-25-6					5.9E+01	2.2E+02		4.6E+01
Tri-n-butyltin	688-73-3					2.3E+00	8.7E+00		1.8E+00
Triacetin	102-76-1					6.3E+05	2.3E+06		4.9E+05
Triallate	2303-17-5					1.0E+02	3.8E+02		8.0E+01
Triasulfuron	82097-50-5					7.8E+01	2.9E+02		6.2E+01
Tribromobenzene, 1,2,4-	615-54-3					3.9E+01	1.5E+02		3.1E+01
Tributyl Phosphate	126-73-8	7.7E+01	2.5E+02		5.9E+01	7.8E+01	2.9E+02		6.2E+01
Tributyltin Compounds	NA					2.3E+00	8.7E+00		1.8E+00
Tributyltin Oxide	56-35-9					2.3E+00	8.7E+00		1.8E+00
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1					2.3E+05		4.0E+03	4.0E+03
Trichloroacetic Acid	76-03-9	9.9E+00	3.3E+01		7.6E+00	1.6E+02	5.8E+02		1.2E+02
Trichloroaniline HCl, 2,4,6-	33663-50-2	2.4E+01	7.8E+01		1.8E+01				
Trichloroaniline, 2,4,6-	634-93-5	9.9E+01	3.3E+02		7.6E+01	2.3E-01	8.7E-01		1.8E-01
Trichlorobenzene, 1,2,3-	87-61-6					6.3E+00	2.3E+01		4.9E+00
Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01			2.4E+01	7.8E+01		6.2E+00	5.8E+00
Trichloroethane, 1,1,1-	71-55-6					1.6E+04		8.6E+02	8.1E+02
Trichloroethane, 1,1,2-	79-00-5	1.2E+01		1.3E+00	1.1E+00	3.1E+01		1.5E-01	1.5E-01

HQ=0.1

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Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Trichloroethylene	79-01-6	8.8E+00		1.1E+00	9.4E-01	3.9E+00		4.6E-01	4.1E-01
Trichlorofluoromethane	75-69-4					2.3E+03		7.6E+01	7.3E+01
Trichlorophenol, 2,4,5-	95-95-4					7.8E+02	2.9E+03		6.2E+02
Trichlorophenol, 2,4,6-	88-06-2	6.3E+01	2.1E+02	1.2E+06	4.8E+01	7.8E+00	2.9E+01		6.2E+00
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5					7.8E+01	2.9E+02		6.2E+01
Trichlorophenoxypropionic acid, -2,4,5	93-72-1					6.3E+01	2.3E+02		4.9E+01
Trichloropropane, 1,1,2-	598-77-6					3.9E+01			3.9E+01
Trichloropropane, 1,2,3-	96-18-4	5.1E-03			5.1E-03	3.1E+01		4.9E-01	4.8E-01
Trichloropropene, 1,2,3-	96-19-5					2.3E+01		7.3E-02	7.3E-02
Tricresyl Phosphate (TCP)	1330-78-5					1.6E+02	5.8E+02		1.2E+02
Tridiphane	58138-08-2					2.3E+01	8.7E+01		1.8E+01
Triethylamine	121-44-8							1.2E+01	1.2E+01
Triethylene Glycol	112-27-6					1.6E+04	5.8E+04		1.2E+04
Trifluralin	1582-09-8	9.0E+01	3.0E+02		6.9E+01	5.9E+01	2.2E+02		4.6E+01
Trimethyl Phosphate	512-56-1	3.5E+01	1.1E+02		2.7E+01	7.8E+01	2.9E+02		6.2E+01
Trimethylbenzene, 1,2,3-	526-73-8							4.9E+00	4.9E+00
Trimethylbenzene, 1,2,4-	95-63-6							5.8E+00	5.8E+00
Trimethylbenzene, 1,3,5-	108-67-8					7.8E+01			7.8E+01
Trinitrobenzene, 1,3,5-	99-35-4					2.3E+02	4.6E+03		2.2E+02
Trinitrotoluene, 2,4,6-	118-96-7	2.3E+01	2.4E+02		2.1E+01	3.9E+00	4.5E+01		3.6E+00
Triphenylphosphine Oxide	791-28-6					1.6E+02	5.8E+02		1.2E+02
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8					1.6E+02	5.8E+02		1.2E+02
Tris(1-chloro-2-propyl)phosphate	13674-84-5					7.8E+01	2.9E+02		6.2E+01
Tris(2-chloroethyl)phosphate	115-96-8	3.5E+01	1.1E+02		2.7E+01	5.5E+01	2.0E+02		4.3E+01
Tris(2-ethylhexyl)phosphate	78-42-2	2.2E+02	7.1E+02		1.7E+02	7.8E+02	2.9E+03		6.2E+02
Uranium (Soluble Salts)	NA					2.3E+01		5.7E+03	2.3E+01
Urethane	51-79-6	1.5E-01	5.4E-01	4.8E+03	1.2E-01				
Vanadium Pentoxide	1314-62-1			4.6E+02	4.6E+02	7.0E+01		9.9E+02	6.6E+01
Vanadium and Compounds	7440-62-2					3.9E+01		1.4E+04	3.9E+01
Vernolate	1929-77-7					7.8E+00	2.9E+01		6.2E+00
Vinclozolin	50471-44-8					2.0E+02	7.3E+02		1.5E+02
Vinyl Acetate	108-05-4					7.8E+03		9.2E+01	9.1E+01
Vinyl Bromide	593-60-2			1.2E-01	1.2E-01			4.3E-01	4.3E-01
Vinyl Chloride	75-01-4	9.4E-02		1.6E-01	5.9E-02	2.3E+01		1.0E+01	7.0E+00
Warfarin	81-81-2					2.3E+00	8.7E+00		1.8E+00
Xylene, P-	106-42-3					1.6E+03		5.8E+01	5.6E+01
Xylene, m-	108-38-3					1.6E+03		5.7E+01	5.5E+01
Xylene, o-	95-47-6					1.6E+03		6.7E+01	6.5E+01
Xylenes	1330-20-7					1.6E+03		6.1E+01	5.8E+01
Zinc Phosphide	1314-84-7					2.3E+00			2.3E+00
Zinc and Compounds	7440-66-6					2.3E+03			2.3E+03
Zineb	12122-67-7					3.9E+02	1.5E+03		3.1E+02

TR=1E-06
HQ=0.1

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1

Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 0.1			
Analyte	CAS No.	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child HQ=0.1 (mg/kg)	Dermal SL Child HQ=0.1 (mg/kg)	Inhalation SL Child HQ=0.1 (mg/kg)	Noncarcinogenic SL Child HI=0.1 (mg/kg)
Zirconium	7440-67-7					6.3E-01			6.3E-01

APPENDIX B

SITE-SPECIFIC DATA QUALITY OBJECTIVE

DATA QUALITY OBJECTIVE NO. 1
WILCOX OIL
MEDIA OF CONCERN: SOIL

STEP 1. STATE THE PROBLEM	
To investigate the nature and extent of site-related contaminants in the soil associated with the Wilcox Oil Site.	
STEP 2. IDENTIFY THE DECISION	
Soil samples will be collected from various locations within the property to determine whether contaminants of concern (CoCs) are significantly elevated in the soil.	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	• If concentrations of CoCs in soil exceed the EPA Region 6 RSLs, then that sample will be considered contaminated and require additional attention. • If concentrations of CoCs in the soil samples do not exceed the EPA Region 6 RSLs, then the media represented by that sample will not require additional attention.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Contaminant concentrations in the soil samples collected from the property.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	Analytical results from parameters listed in Section 4 of the QASP Addendum No. 1.
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	Region 6 RSLs.
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	• Five-point composite samples (surface, 0-6, 6-12 and 12-24 inches bgs) from each designated grid. • See analyses listed in Section 4 of the QASP Addendum No. 1.
STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	The area of concern on the property.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentration in soil within the property.
DEFINE THE SCALE OF DECISION MAKING.	Results of soil sampling will be used to evaluate the CoCs within the property.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The data will apply until the site media, represented by the soil samples, receives appropriate response actions.
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the EPA Team field effort.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	• Inclement weather. • Access not attainable.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	Detection of CoCs in the soil samples by analytical testing to confirm concentrations in the pathway that exceed the EPA Region 6 RSLs.

DATA QUALITY OBJECTIVE NO. 1
WILCOX OIL
MEDIA OF CONCERN: SOIL

SPECIFY THE ACTION LEVEL FOR THE DECISION.	EPA Region 6 RSLs.
STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DEVELOP A DECISION RULE.	If any result in the soil sample is above the EPA Region 6 RSLs, then the soil sample represented by that sample will require additional attention; otherwise, the soil does not require additional attention.
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from 0 milligrams per kilogram (mg/kg) to more than the contaminant -specific action level.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	Type I Error: Deciding that the specified area represented by the soil sample does not exceed the specified assessment level when, in truth, the concentration of the contaminant exceeds its specified assessment level. The consequence of this decision error is that remedial efforts in the area may not be undertaken, possibly endangering human health and the environment. This decision error is more severe. Type II Error: Deciding that the specified area represented by the soil sample does exceed the specified assessment level when, in truth, it does not. The consequences of this decision error are that remediation of the area will continue and unnecessary costs will be incurred.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	The true state of nature when the soil is decided to be below the specified assessment levels when in fact, it is not below the specified assessment levels, is that the area does need remedial action. The true state of nature when the soil is decided to be above the specified assessment levels when in fact, it is not above the specified assessment levels, is that the area does not need remedial action.

DATA QUALITY OBJECTIVE NO. 1
WILCOX OIL
MEDIA OF CONCERN: SOIL

STEP 6. SPECIFY LIMITS ON DECISION ERRORS (Continued)	
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_o) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	Ho: The soil represented by the sample is above the specified action level. Ha: The soil represented by the sample is below the specified action level.
ASSIGN THE TERMS "FALSE POSITIVE" AND "FALSE NEGATIVE" TO THE PROPER DECISION ERRORS.	• False Positive Error = Type I • False Negative Error = Type II
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	To be assigned based on discussions with EPA OSC.
STEP 7. OPTIMIZE THE DESIGN	
REVIEW THE DQOs.	Due to insufficient historical data, determination of the standard deviation was not possible. Therefore, sample size calculation using the traditional statistical formula may not be the optimal design. In order to select the optimal sampling program that satisfies the DQO and is the most resource effective, other elements were considered.
DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN. The EPA Team will collect soil samples from the property in Bristow, Creek County, Oklahoma. The samples will be shipped for laboratory analysis and methodology consistent with EPA Region 6 protocols. The samples will be analyzed by the methods listed in Section 4 of the QASP Addendum No. 1.	

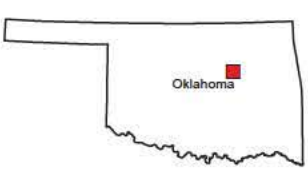
APPENDIX C

PROPOSED SAMPLE LOCATION MAPS

LEGEND

- Property Boundary
- Proposed Depth Investigation Sample (n=4)

0 70 140
Feet



N

TDD NO 5 WESTON-042-15-004

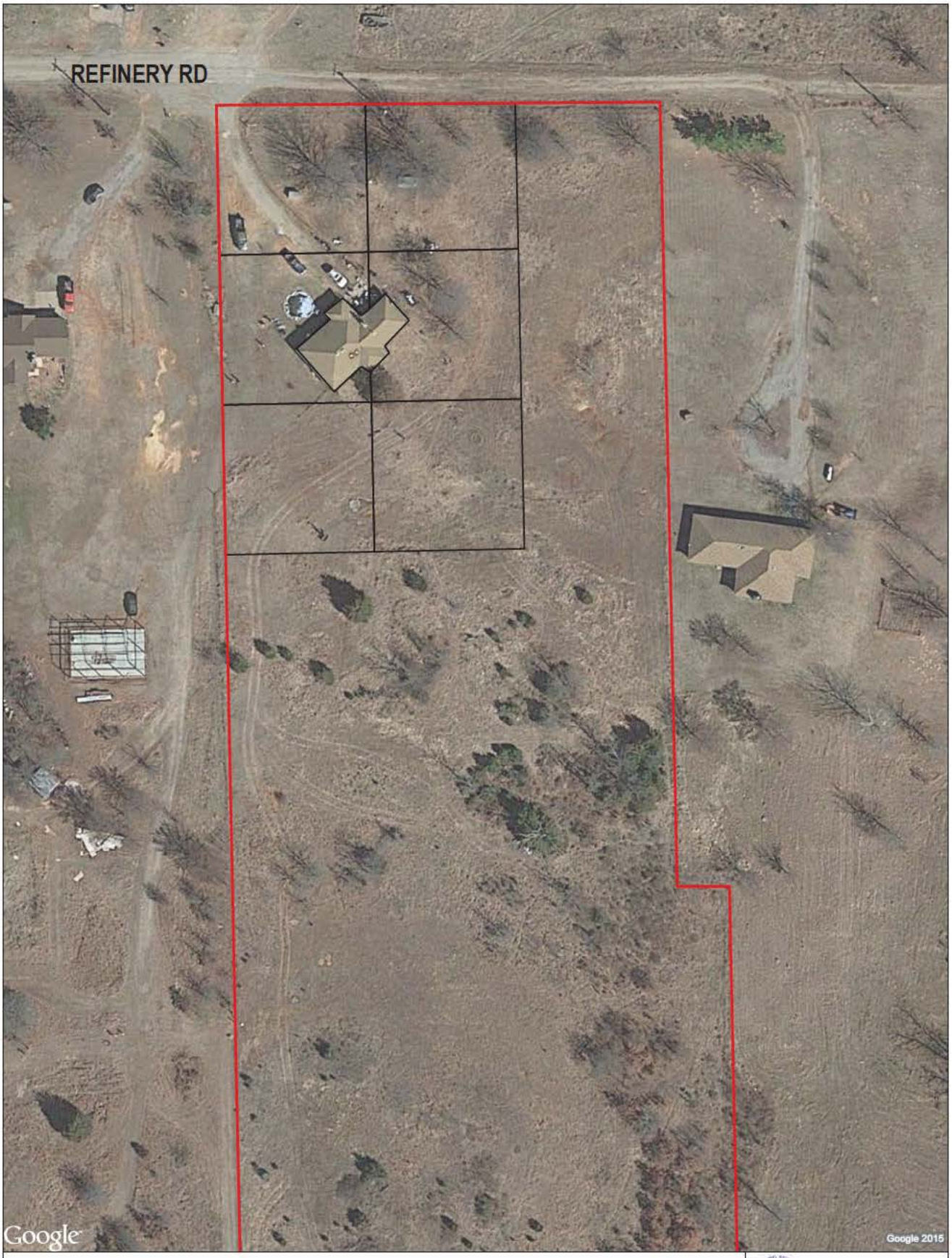
SOURCE 2010 Microsoft Corporation and its data suppliers

US EPA REGION 6

FIGURE C-1
PROPOSED SAMPLE LOCATION MAP
PROPERTY 002
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

FILE: L:\20406_START3_RW\WILCOX_OIL\GIS\MXD\Figure C-1 Property 002 - Proposed Sample Location Map.mxd 3:28:59 PM 4/23/2015 bondp



LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=6)

0 60 120
Feet

N

US EPA REGION 6

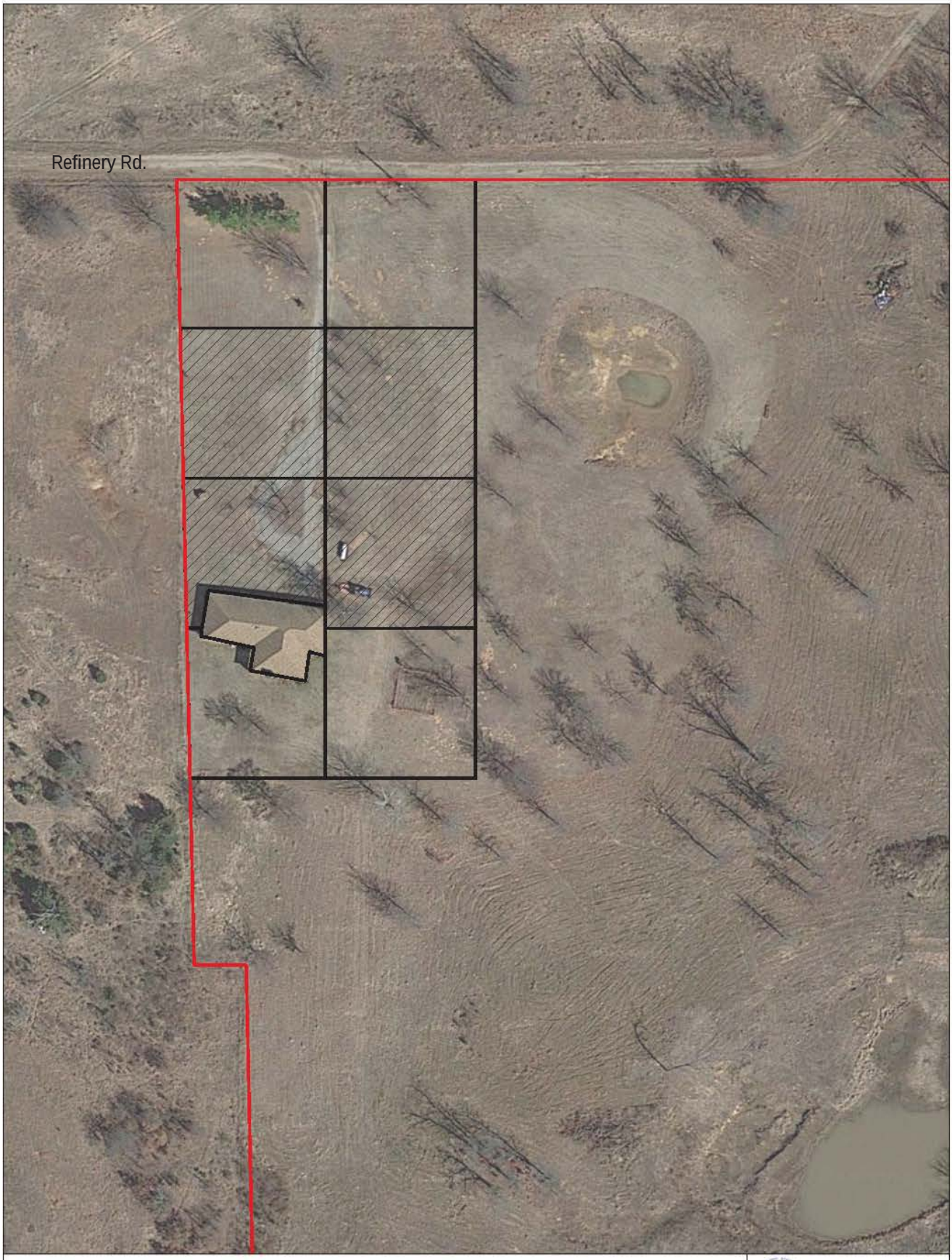
FIGURE C-2
PROPOSED SAMPLE LOCATION MAP
PROPERTY 005
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and its data suppliers

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXD\Figure C-2 Property 005 - Proposed Sample Location Map.mxd 3:28:37 PM 4/23/2015 bondp



LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=4)
- Proposed Depth Investigation Sample (n=4)

0 60 120

Feet

N

US EPA REGION 6

FIGURE C-3
PROPOSED SAMPLE LOCATION MAP
PROPERTY 006
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406 012.005.0919.01	AS SHOWN

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and ts data supp iers

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXDs\Figu e C 3 Property 006 - Proposed Sample Loca ion Map mxd 3:26 07 PM 4/23 2015 bondp

LEGEND

- Property Boundary
- Proposed Depth Investigation Sample (n=4)

0 60 120
Feet

N

TDD NO 5 WESTON-042-15-004

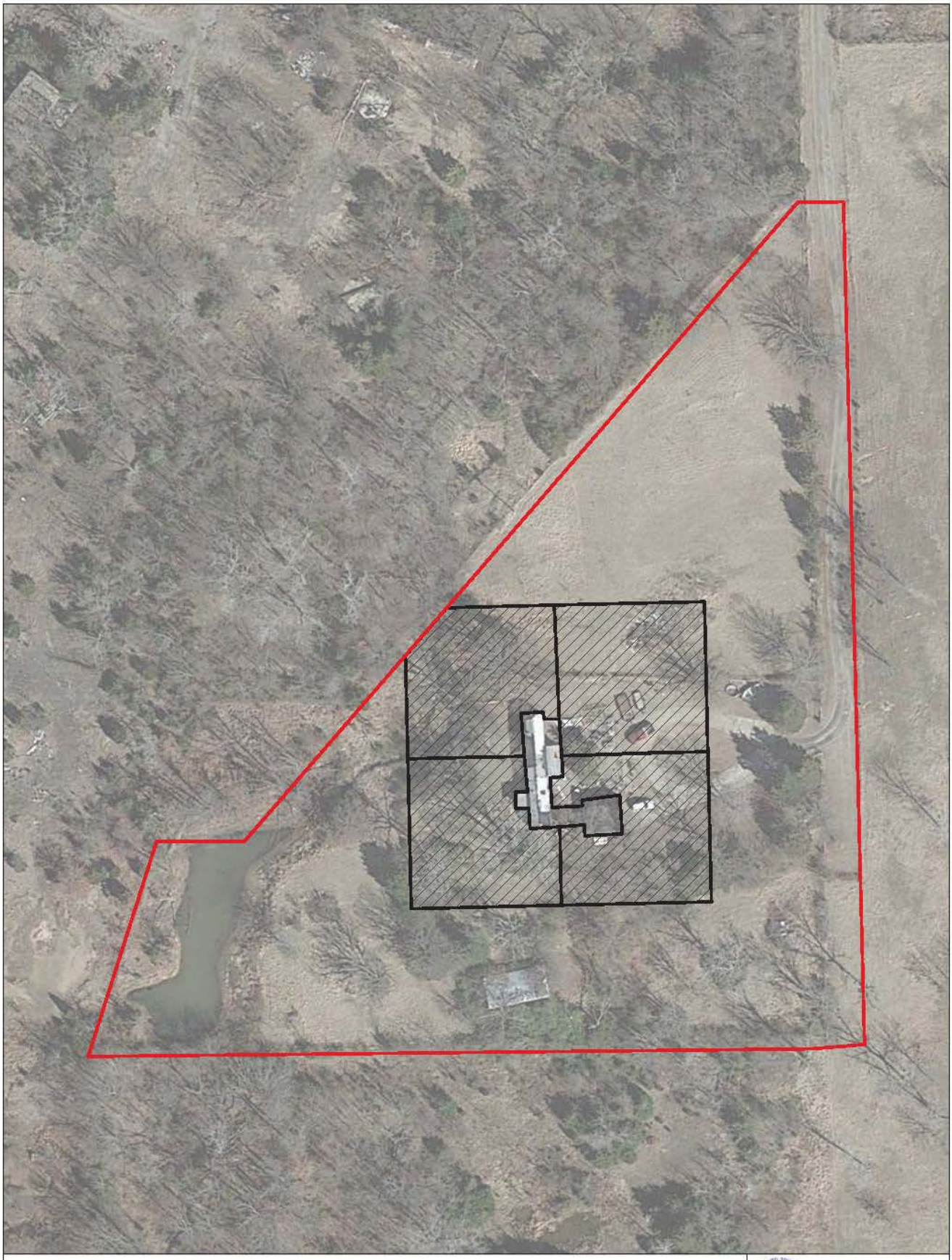
SOURCE 2010 Microsoft Corporation and its data suppliers

US EPA REGION 6

FIGURE C-4
PROPOSED SAMPLE LOCATION MAP
PROPERTY 008
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXD\Figure C-4 Property 008 - Proposed Sample Location Map.mxd 3:25:36 PM 4/23/2015 bondp



LEGEND

Property Boundary

Proposed Depth Investigation Sample (n=4)

0 60 120

Feet

N

US EPA REGION 6

FIGURE C-5
PROPOSED SAMPLE LOCATION MAP
PROPERTY 011
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406 012.005.0919.01	AS SHOWN

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and ts data supp iers

FILE: L:\20406_START3_R6 WILCOX_OIL GIS\MXDs\Figure C-5 Property 011 - Proposed Sample Loca ion Map mxd 3 25 14 PM 4 23 2015 bondp

LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=6)

0 60 120
Feet

N

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and its data suppliers

US EPA REGION 6

FIGURE C-6
PROPOSED SAMPLE LOCATION MAP
PROPERTY 017
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXD\Figure C 6 Property 017 - Proposed Sample Location Map.mxd 3:24:46 PM 4/23/2015 bcndp

LEGEND

Property Boundary

Proposed 100x100ft Sample Grid (n=5)

0 60 120

Feet

N

US EPA REGION 6

FIGURE C-7
PROPOSED SAMPLE LOCATION MAP
PROPERTY 018
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406 012.005.0919.01	AS SHOWN

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and ts data supp iers

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXDs\Figure C-7 Property 018 - Proposed Sample Loca ion Map mxd 3 24 28 PM 4 23/2015 bondp

LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=8)

0 60 120
Feet

N

TDD NO 5 WESTON-042-15-004

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FIGURE C-8
PROPOSED SAMPLE LOCATION MAP
PROPERTY 019
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

FILE: L:\20406_START3_R6\WILCOX_OIL\GIS\MXD\Figure C-8 Property 019 - Proposed Sample Location Map.mxd 3:23:46 PM 4/23/2015 bondp

LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=6)

0 60 120
Feet

N

US EPA REGION 6

FIGURE C-9
PROPOSED SAMPLE LOCATION MAP
PROPERTY 020
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and its data suppliers

FILE: L:\20406_START3_RW\WILCOX_OIL\GIS\MXD\Figure C-9 Property 020 - Proposed Sample Location Map.mxd 3:23:05 PM 4/23/2015 bondp

LEGEND

- Property Boundary
- Proposed 100x100ft Sample Grid (n=7)

0 60 120
Feet

N

TDD NO 5 WESTON-042-15-004

SOURCE 2010 Microsoft Corporation and its data suppliers

US EPA REGION 6

FIGURE C-10
PROPOSED SAMPLE LOCATION MAP
PROPERTY 021
WILCOX OIL
WEST 221st STREET/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
APRIL 2015	20406.012.005.0919.01	AS SHOWN

FILE: L:\20406_START3_R6\WILCOX_OIL\G IS\MXD\Figure C-10 Property 021 - Proposed Sample Location Map.mxd 3:22:32 PM 4/23/2015 bondp

APPENDIX B

STANDARD OPERATING PROCEDURES

INTRODUCTION

The following Standard Operating Procedure (SOP) is to describe the procedures for collecting representative soil samples. Analysis of soil samples may determine whether concentrations of specific soil pollutants exceed established action levels, or if the concentrations of soil pollutants present a risk to public health, welfare, or the environment. This SOP is similar to SOP Number 1001.03 for collecting near surface soil samples with a hand auger.

PROCEDURE

Surface soil samples may be collected using a variety of methods and equipment. The methods and equipment used are dependent on the depth of the desired sample, the type of sample required (disturbed versus undisturbed), and the type of soil. Near-surface soils may be easily sampled using a spade, trowel, or hand scoop.

Sample Preservation

Cooling to 4°C ± 2°C, supplemented by a minimal holding time, is suggested.

Interferences and Potential Problems

There are two primary interferences or potential problems associated with soil sampling: cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the use of dedicated (disposable) sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in compaction of the sample, or inadequate homogenization of the samples where required, resulting in variable, non-representative results. Homogenization may also affect sample representativeness where the analytical requirements include volatile organic compounds.

Equipment or Apparatus

The equipment used for sampling may be selected from the following list, as appropriate:

- Tape measure
- Survey stakes or flags
- Stainless steel, plastic, or other appropriate homogenization bucket or bowl
- Ziploc plastic bags
- Logbook
- Labels
- Chain-of-custody forms and seals
- Coolers
- Ice
- Decontamination supplies and equipment
- Canvas or plastic sheet
- Spatulas/spades/shovels
- Scoops

- Plastic or stainless steel spoons
- Trowel

Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and what equipment and supplies are required.
2. Obtain necessary sampling and monitoring equipment from the list above.
3. Prepare schedules, and coordinate with staff, client, and regulatory agencies, if appropriate.
4. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
5. Decontaminate or preclean equipment, and ensure that it is in working order.
6. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations will be utility-cleared by the property owner or other responsible party prior to soil sampling.
7. Evaluate safety concerns associated with sampling that may require use of personal protective equipment and/or air monitoring.

Surface Soil Sample Collection

Collect samples from the near-surface soil with tools such as spades, shovels, and scoops. Surface material can be removed to the required depth with this equipment, then a stainless steel or plastic scoop can be used to collect the sample. The use of a flat, pointed mason trowel to cut a block of the desired soil can be helpful when undisturbed profiles are required. A stainless steel scoop, lab spoon, or plastic spoon will suffice in most other applications. Avoid the use of devices plated with chrome or other target analyte materials.

The following procedures should be followed when collecting surface soil samples:

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.
2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.
3. If volatile organic analysis is to be performed, transfer a portion of the sample directly into an appropriate, labeled sample container(s) with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly; or if composite samples are to be collected, place a sample from another sampling interval into the

homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled container(s) and secure the cap(s) tightly.

4. Fill hole created through sampling with unused material or other appropriate backfill material (sand).
5. Record applicable information into field log book or appropriate forms as documentation of sampling.

INTRODUCTION

The following Standard Operating Procedure (SOP) describes the procedure for compositing soil samples. Soil samples are typically collected for laboratory analysis, and sometimes it is necessary to composite (mix together) samples from several locations for one combined analysis at the laboratory. This soil sampling procedure is closely related to SOP Nos. 1001.01, 1001.03, and 1001.10 regarding soil sampling procedures. This procedure serves as an alternative method of sample preparation prior to placing the samples in containers, as described in the other named SOPs.

PROCEDURE

Equipment

Equipment that may be used as part of the soil compositing procedure is identified under SOP Nos. 1001.01 and 1001.03 where soil sampling methods are described. Specific equipment typically used during the compositing process after discrete samples are collected includes:

- Mixing bowls or buckets
- Scoops, spatulas, and knives
- Sample containers
- Personal protection clothing
- Plastic Sheeting
- Decontamination equipment and supplies

Method

The procedure to be used to physically collect soil samples are described in SOP Nos. 1001.01 and 1001.03. Reference should be made to these SOPs for specific sampling equipment, procedures, and other general guidelines. As soil samples are collected, the site-specific Sampling and Analysis Plan may required compositing (mixing together) of two or more samples to create a single sample that will be sent to the laboratory for analysis. When this is the case, the following compositing procedure will generally be used:

- The soil will be collected in general accordance with SOP 1001.01 or 1001.03, with the exception that samples from discrete locations will generally not be immediately placed into sample containers and an additional preparation step (i.e., compositing) will be performed.

- As they are collected, soil samples selected for compositing will be staged in a clean mixing bowl or mixing bucket until each sample to be included in the composite sample is obtained. Depending on site requirements and analytical procedures to be requested, it may be necessary to temporarily stage individual discrete-location samples within clean sample jars, aluminum foil, or other appropriate materials for the project. The method for sample staging should be specified in the site-specific sampling and analysis plan.

- For composite samples that will be analyzed for volatile organic compounds, an equal portion of soil will be removed directly from each discrete-location sample and placed into a final sample jar without homogenizing the soil.

- For analyses other than volatile organics, equal portions of soil will be removed from each discrete-location sample and placed in a clean mixing bowl. The equal portions of the samples will then be broken up and homogenized together using a scoop or spatula. Homogenization will generally continue until the discrete samples being combined are reasonably indistinquishable as indivual individual samples in the soil mixture. However, it is recognized that homogenization can be difficult for highly plastic clays. In this case, equal amounts of the the soil core of each clay sample will be cut into small, roughly cubical pieces using a stainless steel knife, and an equal numbers of pieces of each discrete sample will be placed into the bowl and homogenized to extent practical.

- The composited soil sample will be collected from the mixing bowl containing the individual homogenized samples after homogenization is performed. The composited sample will be collected using a stainless steel or disposable plastic scoop or similar tool. The sample will be placed in a clean sample container and then handled in accordance with soil sampling SOPs 1001.01 and 1001.03.

Variations on this procedure are allowable to accomodate different soil conditions and any site requirements specifically identified in the site-specific Sampling and Analysis Plan.

The number of discrete samples that may be composited into a single sample typically ranges from two to six. The number of discrete samples that may be composited for the project in question will be specified in the site-specific Sampling and Analysis Plan.

REFERENCES

SOP No. 1001.01 - Standard Operating Procedure, Surface Soil Sampling
SOP No. 1001.03 - Standard Operating Procedure, Shallow Subsurface and Near Surface Soil Sampling

INTRODUCTION

The following Standard Operating Procedure (SOP) describes the procedure for collecting field duplicate soil and water samples. When samples are collected for analysis, it is typically desired that independent data allowing evaluation of laboratory precision (i.e., the degree to which a laboratory result can be repeated) on site-specific samples be collected.

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicated samples by laboratory personnel performing the analysis. Specific locations are designated for collection of field duplicate samples prior to the beginning of sample collection.

The duplicate soil sampling procedure is closely related to SOP Nos. 1001.01, 1001.03, and 1001.10 regarding soil sampling procedures. This procedure serves as an alternative method or extension of sample preparation prior to placing the samples in containers, as described in the 1001 series of the SOPs (e.g. 1001.01 and 1001.03).

DUPLICATE SOIL SAMPLING PROCEDURE

The procedure to be used to physically collect soil samples are described in SOP Nos. 1001.01 and 1001.03. Reference should be made to these SOPs for specific sampling equipment, procedures, and other general guidelines. As soil is collected, the following procedure will be used to prepare a field duplicate sample:

- The soil will be collected in general accordance with SOP 1001.01 or 1001.03, with the exception that samples will generally not be immediately placed into sample containers and an additional preparation step (i.e., sample splitting) will be performed.

- As they are collected, soil samples to be submitted as field duplicates will be staged in a clean mixing bowl or mixing bucket.

- For samples that will be analyzed for volatile organic compounds, the soil sample will be split in half and an equal portion of soil will be placed directly into two or more different sample containers, each container representing a different sample for laboratory analysis. The soil will not be homogenized to minimize the potential for volatilization of the organic compounds potentially in the sample.

- For analyses of chemicals other than volatile organic compounds, the soil removed from the discrete sample location will be homogenized in a clean mixing bowl using a clean scoop or spatula (as described in SOPs 1001.01 and 1001.03). Homogenization will generally continue until the discrete samples being combined are reasonably indistinguishable as individual samples in the soil mixture. However, it is recognized that homogenization can be difficult for highly plastic clays. In this case, equal amounts of the soil core of each clay sample will be cut into small, roughly cubical pieces using a stainless steel knife and placed into a bowl and homogenized to extent practical.

- The field duplicate sample (except for volatiles as note above) will be collected from the mixing bowl containing the homogenized samples after homogenization is performed. The composited sample will be collected using a stainless steel or disposable plastic scoop or similar tool. The sample will be placed in a clean sample container and then handled in accordance with soil sampling SOPs 1001.01 and 1001.03.

Another difference from the referenced SOPs is that additional soil volume may need to be collected from a discrete sample location during the sampling process to provide sufficient sample volume for two or more sets of laboratory analyses. If the collection of additional sample volume will result in the sample interval expanding to greater depths or laterally outward, the sampling tools identified in 1001 series of the SOPs can be used at two immediately vertically or laterally adjacent locations, as appropriate. If sampling from two adjacent but distinct locations is necessary to obtain adequate sample volume, the soil from the two locations should be composited in accordance with SOP 1001.10. Field duplicates of composited samples may also be performed using this SOP for field duplicate samples.

Variations on this procedure are allowable to accommodate different soil conditions and any site requirements specifically identified in the site-specific Sampling and Analysis Plan. Equipment that may be used as part of the soil compositing procedure is identified under SOP Nos. 1001.01 and 1001.03 where soil sampling methods are described.

DUPLICATE WATER SAMPLING PROCEDURES

The procedure to be used to physically collect water samples are described in 1002 series of the SOPs (e.g. 1002.01 and 1002.02). Reference should be made to these SOPs for specific sampling equipment, procedures, and other general guidelines. A duplicate water sample will be collected from the same location as the parent sample and within 15 minutes of the collection of the parent sample.

The number of samples that may be submitted as blind field duplicates for the project in question will be specified in the site-specific sampling plan. Blind field duplicates are typically collected at a frequency of 1 per 10 samples of a given environmental media at sites, especially where laboratory analytical data will be used for evaluating regulatory compliance and other engineering judgments. Sampling in support of a routine monitoring program may not require field duplicates. Reference should be made to the site-specific contract and work plans.

REFERENCES

SOP No. 1001.01 - Standard Operating Procedure, Surface Soil Sampling
SOP No. 1001.03 - Standard Operating Procedure, Soil Sampling - Hand Auger Method
SOP No. 1001.10 - Standard Operating Procedure, Soil Compositing

INTRODUCTION

The following Standard Operating Procedure (SOP) presents procedures for maintaining sample chain of custody (COC) during activities where samples are collected.

PROCEDURE

Sample custody is defined as being under a person's custody if any of the following conditions exist:

- it is in their possession,
- it is in their view, after being in their possession,
- it was in their possession and they locked it up, or
- it is in a designated secure area.

A designated field sampler will be personally responsible for the care and custody of collected samples until they are transferred to another person or properly dispatched to the laboratory. To the extent practicable, as few people as possible will handle the samples.

Sample tags or labels will be completed and applied to the container of each sample. When the tags or labels are being completed, waterproof ink will be used. If waterproof ink is not used, the tags or labels will be covered by transparent waterproof tape. Sample containers may also be placed in Ziploc-type storage bags to help keep them clean in the cooler. Information typically included on the sample tags or labels will include the following:

- Project Code
- Station Number and Location
- Sample Identification Number
- Date and Time of Sample Collection
- Type of Laboratory Analysis Required
- Preservation Required, if applicable
- Collector's Signature
- Priority (optional)
- Other Remarks

Additonal information may include:

- Anticipated Range of Results (Low, Medium, or High)
- Sample Analysis Priority

A COC form will be completed each time a sample or group of samples is prepared for transfer to the laboratory. The form will repeat the information on each of the sample labels and will serve as documentation of handling during shipment. The minimum information requirements of the COC form are listed in Table 1101.01-A. An example COC form is shown in Figure 1101.01-A. The completed COC must be reviewed by the Field Team Leader or Site Manager prior to sample shipment. The COC form will remain each sample shipping container at all times, and another copy will be retained by the member of the sampling team who originally relinquished the samples or in a project file.

TABLE 1101.01-A CHAIN OF CUSTODY FORM

INFORMATION	COMPLETED BY	DESCRIPTION
COC	Laboratory	enter a unique number for each chain of custody form
SHIP TO	Field Team	enter the laboratory name and address
CARRIER	Field Team	enter the name of the transporter (e.g., FedEx) or handcarried
AIRBILL	Field Team	enter the airbill number or transporter tracking number (if applicable)
PROJECT NAME	Field Team	enter the project name
SAMPLER NAME	Field Team	enter the name of the person collecting the samples
SAMPLER SIGNATURE	Field Team	signature of the person collecting the samples
SEND RESULTS TO	Field Team	enter the name and address of the prime contractor
FIELD SAMPLE ID	Field Team	enter the unique identifying number given to the field sample (includes MS, MSD, field duplicate and field blanks)
DATE	Field Team	enter the year and date the sample was collected in the format M/D (e.g., 6/3)
TIME	Field Team	enter the time the sample was collected in 24 hour format (e.g., 0900)
MATRIX	Field Team	enter the sample matrix (e.g., water, soil)
PRESERVATIVE	Field Team	enter the preservative used (e.g., HNO3) or "none"
FILTERED/ UNFILTERED	Field Team	enter "F" if the sample was filtered or "U" if the sample was not filtered
CONTAINERS	Field Team	enter the number of containers associated with the sample
MS/MSD	Field Team or Laboratory	enter "X" if the sample is designated for the MS/MSD
ANALYSES REQUESTED	Field Team	enter the method name of the analysis requested (e.g., SW6010A)
COMMENTS	Field Team	enter comments
SAMPLE CONDITION UPON RECEIPT AT LABORATORY	Laboratory	enter any problems with the condition of any sample(s)
COOLER TEMPERATURE	Laboratory	enter the internal temperature of the cooler, in degrees C, upon opening
SPECIAL INSTRUCTIONS/COMMENTS	Laboratory	enter any special instructions or comments
RELEASED BY (SIG)	Field Team and Laboratory	enter the signature of the person releasing custody of the samples
COMPANY NAME	Field Team and Laboratory	enter the company name employing the person releasing/receiving custody
RECEIVED BY (SIG)	Field Team and Laboratory	enter the signature of the person receiving custody of the samples
DATE	Field Team and Laboratory	enter the date in the format M/D/YY (e.g., 6/3/96) when the samples were released/received
TIME	Field Team and Laboratory	enter the date in 24 hour format (e.g., 0900) when the samples were released/received

SOP	**1102.01**				
GROUP	Sample Handling				
SUB-GROUP	Sample Shipping				
TITLE	Sample Shipping				
DATE	11/19/2001	**FILE**	1102-01.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the procedures for sample shipping that will be implemented during field work involving sampling activities.

TERMS

COC - Chain-of-Custody

PROCEDURE

Prior to shipping or transferring custody of samples, they will be packed according to D.O.T. requirements with sufficient ice to maintain an internal temperature of 4°C ± 2°C during transport to the laboratory. Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

1. Samples will be accompanied by a COC record. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. If sent by common carrier, a bill of lading or airbill should be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer. This custody record documents transfer of sample custody from the sampler to another person or to the laboratory. The designated laboratory will accept custody in the field upon sample pick-up or at the laboratory if the samples are delivered via field personnel or a courier service.
2. Samples will be properly packed in approved shipping containers for laboratory pick-up by the appropriate laboratory for analysis, with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be padlocked or custody-sealed for transfer to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to itself so that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape. The seal will then be signed. The designated laboratory will accept custody of the samples upon receipt.
3. Whenever samples are split with state representatives or other parties, the COC record will be marked to indicate with whom the samples were split.
4. The field sampler will call the designated laboratory to inform them of sample shipment and verify sample receipt as necessary.

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the methods used for minimizing the potential for cross-contamination, and provides general guidelines for sampling equipment decontamination procedures.

PROCEDURE

As part of the Health and Safety Plan (HASP), develop and set up a decontamination plan before any personnel or equipment enter the areas of potential exposure. The decontamination plan should include the following:

- The number, location, and layout of decontamination stations
- Which decontamination apparatus is needed
- The appropriate decontamination methods
- Methods for disposal of contaminated clothing, apparatus, and solutions

Decontamination Methods

Personnel, samples, and equipment leaving the contaminated area of a site will be decontaminated. Various decontamination methods will be used to either physically remove contaminants, inactivate contaminants by disinfection or sterilization, or both. The physical decontamination techniques appropriate for equipment decontamination can be grouped into two categories: abrasive methods and non-abrasive methods.

Abrasive Cleaning Methods

Abrasive cleaning methods work by rubbing/scrubbing the surface containing the contaminant. This method includes mechanical and wet blasting methods.

Mechanical cleaning methods use brushes of metal or nylon. The amount and type of contaminants removed will vary with the hardness of bristles, length of brushing time, and degree of brush contact.

Cleaning can also be accomplished by water blasting which is also referred to as steam cleaning and pressure washing. Pressure washing utilizes high-pressure that is sprayed from a nozzle onto sampling equipment to physically remove soil or (potentially) contaminated material. Steam cleaning is a modification of pressure washing where the water is heated to temperatures approaching 100°C to assist in removing organic constituents from equipment.

Disinfection/Rinse Methods

Disinfectants are a practical means of inactivating chemicals or contaminants of concern. Standard sterilization methods involve heating the equipment which is impractical for large equipment. Rinsing removes contaminants through dilution, physical attraction, and solubilization.

The use of distilled/deionized water commonly available from commercial vendors may be acceptable for decontamination of sampling equipment provided that it has been verified by laboratory analysis to be target analyte free. Tap water may be used from any municipal water treatment system for mixing of decontamination solutions. An untreated potable water supply is not an acceptable substitute for tap water. Acids and solvents are occasionally utilized in decontamination of equipment to remove metals and organics, respectively, from sampling equipment. Other than ethanol, these are avoided when possible due to the safety, disposal, and transportation concerns associated with them.

Equipment or apparatuses that may be selected for use include the following:

- Personal protective clothing
- Non-phosphate detergent
- Selected solvents for removal of polar and nonpolar organics (ethanol, methanol, hexane)
- Acid washes for removal of metals (nitric acid)
- Long-handled brushes
- Drop cloths or plastic sheeting
- Paper towels
- Galvanized tubs or buckets
- Distilled, deionized, or tap water (as required by the project)
- Storage containers for spent wash solutions
- Sprayers (pressurized and non-pressurized)
- Trash bags
- Safety glasses or splash shield

<u>Field Sampling Equipment Cleaning Procedures</u>

The following procedures should be followed:

1. Where applicable, follow physical removal procedures previously described (pressure wash, scrub wash)
2. Wash equipment with a non-phosphate detergent solution
3. Rinse with tap water
4. Rinse with distilled or deionized water
5. Rinse with 10% nitric acid if the sample will be analyzed for metals/organics
6. Rinse with distilled or deionized water
7. Use a solvent rinse (pesticide grade) if the sample will be analyzed for organics
8. Air dry the equipment completely
9. Rinse again with distilled or deionized water

10. Place in clean bag or container for storage/transport to subsequent sampling locations.

Selection of the solvent for use in the decontamination process is based on the contaminants present at the site. Solvent rinses are not necessarily required when organics are not a contaminant of concern and may be eliminated from the sequence specified below. Similarly, an acid rinse is not required if the analyses do not include inorganics. Use of a solvent is required when organic contamination is present on-site. Typical solvents used for removal of organic contaminants include acetone, ethanol, hexane, methanol, or water. An acid rinse step is required if metals are present on-site. If a particular contaminant fraction is not present at the site, the ten-step decontamination procedure listed above may be modified for site specificity.

Sampling equipment that requires the use of plastic tubing should be disassembled and the tubing replaced with clean tubing before commencement of sampling and between sampling locations. Plastic tubing should not be reused.

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the sample nomenclature for analytical samples that will generate unique sample names compatible with most data management systems. The sample nomenclature is based upon specific requirements for the reporting of these results. A site specific data management plan should be prepared prior to sample collection.

PROCEDURE

SAMPLE NOMENCLATURE – SOIL AND SEDIMENT

Area of Concern – ID – Depth - Collection Type + QC Type

Where:

Area of Concern: A four-digit identifier used to designate the particular Area of Concern (AOC) that the location where the sample was collected.

ID: A three-digit identifier used to designate the particular location in the AOC from which the sample was collected or the center of the composite sample.

Depth: A two-digit code used to designate what depth of sample was collected:

03	0 to 3 inches
06	3 to 6 inches
12	6 to 12 inches

Collection Type: A one-digit code used to designate what type of sample was collected:

1	Surface Water
2	Ground Water
3	Leachate
4	Field QC/water sample
5	Soil/Sediment

6	Oil
7	Waste
8	Other
9	Drinking Water

QC Type: A one-digit code used to designate the QC type of the sample:

1	Normal
2	Duplicate
3	Rinsate Blank
4	Trip Blank
5	Field Blank
6	Confirmation

Examples:

- ***2054-055-06-51:*** Represents the normal soil sample collected from AOC 2054 at location 055 from 3 to 6 inches of depth.
- ***2054-055-06-52***: Represents the duplicate soil sample collected from AOC 2054 at location 055 from 3 to 6 inches of depth.
- ***2054-055-06-43***: Represents the rinsate water sample collected after the last sample of the day if last sample was collected from AOC 2054 at location 055 from 3 to 6 inches of depth.

SAMPLE NOMENCLATURE – WATER (from fixed station or location to be sampled more than once)

WELL OR STATION – YYYYMMDD - Collection Type + QC Type

Where:

Well or Station: For Wells and boreholes always assume there will be 10 or more so Monitoring Well 1 becomes designated MW01 or MW-01. If it is anticipated that there will be over 100 wells designate Monitoring Well 1 as MW001 or MW-001.

YYYYMMDD: A four-digit year + two-digit month + two-digit day

Collection Type: A one-digit code used to designate what type of sample was collected and are shown on page 1.

QC Type: A one-digit code used to designate the QC type of the sample and are shown on page 1.

Examples:

- ***MW01-20090226-21:*** Represents the normal groundwater sample collected from Monitoring Well 1 on 26 February 2009.
- ***MW01-20090226-44:*** Represents the trip blank in the same ice chest as the groundwater sample in the previous collected from Monitor Well 1 on 02/26/2009. All trip blanks must have a sample ID and they must be unique and on the Chain-of -Custody.
- ***2054-000-00-43:*** Represents the rinsate sample from AOC 2054

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the procedures for documenting activities observed or completed in the field in a field logbook. The documentation should represent all activities of WESTON personnel and entities under WESTON's supervision.

TERMS

FSP - Field Sampling Plan

SAP - Sampling and Analysis Plan

QAPP - Quality Assurance Project Plan

HASP - Health and Safety Plan

PROCEDURE

Field logbooks will be used and maintained during field activities to document pertinent information observed or completed by WESTON personnel or entities that WESTON is responsible for providing oversight. Field logbooks are legal documents that form the basis for later written reports and may serve as evidence in legal proceedings. The Site Manager or Field Team Leader will review field log entries daily and initial each page of entries. Field logbooks will be maintained by the Site Manager or Field Team Leader during field activities and transferred to the project files for a record of activities at the conclusion of the project. General logbook entry procedures are listed below.

- Logbooks must be permanently bound with all pages numbered to the end of the book. Entries should begin on page 1.
- Only use blue or black ink (waterproof) for logbook entries.
- Sign entries at the end of the day, or before someone else writes in the logbook.
- If a complete page is not used, draw a line diagonally across the blank portion of the page and initial and date the bottom line.
- If a line on the page is not completely filled, draw a horizontal line through the blank portion.
- Ensure that the logbook clearly shows the sequence of the day's events.
- Do not write in the margins or between written lines, and do not leave blank pages to fill in later.
- If an error is made, make corrections by drawing a single line through the error and initialing it.
- Maintain control of the logbook and keep in a secure location.

Field logbooks will contain, at a minimum, the following information, if applicable:

General Information

- Name, location of site, and work order number
- Name of the Site Manager or Field Team Leader
- Names and responsibilities of all field team members using the logbook (or involved with activities for which entries are being made)
- Weather conditions
- Field observations
- Names of any site visitors including entities that they represent

Sample Collection Activities

- Date(s) and times of the sample collection or event.
- Number and types of collected samples.
- Sample location with an emphasis on any changes to documentation in governing documents (i.e., SAP, FSP). This may include measurements from reference points or sketches of sample locations with respect to local features.
- Sample identification numbers, including any applicable cross-references to split samples or samples collected by another entity.
- A description of sampling methodology, or reference to any governing document (i.e., FSP, SAP, QAPP).
- Summary of equipment preparation and decontamination procedures.
- Sample description including depth, color, texture, moisture content, and evidence of waste material or staining.
- Air monitoring (field screening) results.
- Types of laboratory analyses requested.

Site Health and Safety Activities

- All safety, accident, and/or incident reports.

- Real-time personnel air monitoring results, if applicable, or if not documented in the HASP.
- Heat/cold stress monitoring data, if applicable.
- Reasons for upgrades or downgrades in personal protective equipment.
- Health and safety inspections, checklists (drilling safety guide), meetings/briefings.
- Calibration records for field instruments.

Oversight Activities

- Progress and activities performed by contractors including operating times.
- Deviations of contractor activities with respect to project governing documents (i.e., specifications).
- Contractor sampling results and disposition of contingent soil materials/stockpiles.
- Excavation specifications and locations of contractor confirmation samples.
- General site housekeeping and safety issues by site contractors.