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NSA CRANE
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U S NAVY RESPONSE TO THE U S EPA REGION V COMMENTS ON 12 AND 21 FEBRUARY 2014 REGARDING THE DRAFT FINAL VAPOR INTRUSION SAMPLING PLAN FOR SWMU 16 NSA CRANE IN
03/21/2014
TETRA TECH

RESPONSES TO USEPA REGION V COMMENTS (02/21/14) ON THE DRAFT FINAL SWMU 16 VAPOR INTRUSION SAMPLING PLAN (APRIL 2013) NSA CRANE

Response to Comment 2:

Per the SOP-02 revision, in Section 4.3 it is unclear how the Helium tracer/Helium gas shroud is created prior to leak testing. Please provide additional description of this activity. Also, please clarify what seems to be a contradiction in sub-slab sampling times. The SOP refers to both 45 minute and 30 minute collection times while the workplan states that the summa canisters will operate continuously for 8-hours.

NSA Crane Response: SOP-02 has been revised to describe how the helium gas shroud is created and the sample collection times. A copy of the revised SOP-02 is attached to this response to comment document.

Response to Comment 5:

Referring to the revised Table 4-1, based on U.S. EPA risk assessment guidance and current practice in Region 5, Responsible Parties are not required to base chemical constituent screening levels on an HQ of 0.1. A target Hazard Quotient of 1 may still be used for the purpose of selecting constituent screening level concentrations and determining if laboratories will be able to achieve Sample Quantitative Limits at (and preferably below) the screening level.

For projects where indoor air sampling will be performed, the use of an HQ of 1 for screening constituents is supported by the following:

The EPA web site for Vapor Intrusion contains a link to the EPA-OSWER on-line tool called the "Vapor Intrusion Screening Level (VISL) Calculator Version 3.2, November 2013." In that calculator, the default screening level for non-carcinogenic constituents remains at a value of HQ = 1.0

The IDEM Remediation Closure Guide became effective on March 22, 2012. In "Appendix A - Screening Levels" tables, the screening levels for constituents with a non-cancer endpoint are derived for an HQ of 1 (for example, see trichloroethylene and tetrachloroethylene).

Region 5 agrees with NSA Crane's plan to use a cancer risk level of 1E-06 to select screening levels for constituents with a cancer endpoint. For any constituent which has both a cancer endpoint and a non-cancer endpoint, NSA Crane should display the numerical screening levels corresponding to a cancer risk of 1E-06 and a Hazard Quotient of 1. Then, depending on which value is lower, NSA Crane should consult with its analytical laboratory to confirm that a Sample LOQ below the screening level can be achieved for that constituent. Please describe instances where the lab may not be able to achieve a LOQ below the screening level.

NSA Crane Response: The project screening levels (PSLs) have been revised in Table 4-1 to show the lowest value of either the 1E-06 and a Hazard Quotient of 1 target risk. It is important to note that the laboratory will report the analytical results to the designated levels of detection (LOD) given in Table 4-1. As a result, the laboratory will be able to achieve a detection limit below all PSLs. A revised copy of Table 4-1 is attached to this response to comment document.

RESPONSES TO USEPA REGION V COMMENTS (02/12/14)
ON THE DRAFT FINAL SWMU 16 VAPOR INTRUSION SAMPLING PLAN (APRIL 2013)
NSA CRANE

Comment 1:

All the analytes associated with chlorinated solvents from the site-specific volatile organic compounds (VOCs) detected in groundwater and/or soil samples and their degradation products should be carried forward for further investigation of vapor intrusion into indoor air. The plan only proposes to analyze for the TCE degradation chain; however, PCE was detected in groundwater at up to 160 ug/L. Add PCE into the analytical suite for this project. Similarly, chlorinated alkanes were also detected in groundwater (up to 220 ug/L for 1,1,2-TCA). Add 1,1,2,2-PCA and its degradation products to the analytical suite for this project. Modify the text and tables (e.g. Table 4-1) of the documents needed to reflect the addition of the site-specific VOCs.

Response: Table 4-1 has been updated to include PCE, 1,1,2-TCA, plus 1,1,2,2-PCA and its degradation products (1,1,2-trichloroethane, 1,2-dichloroethane, chloroethane, and ethane) to the analytical suite. COPC selection tables were reviewed to identify all volatile chlorinated compounds that were detected in soils and groundwater. In addition, chloroform, dichlorodifluoromethane, methylene chloride, and trichlorofluoromethane were also added to Table 4-1.

Comment 2:

Modify Section 2.4.2 and SOP-02 to indicate that a helium leak test will be performed prior to sub-slab sampling to verify the seal of the sample point. If the seal is compromised, the sample point will be re-sealed until the helium leak test passes. Also, indicate the waiting time following sub-slab sample point installation and prior to sub-slab sample collection which will allow for equilibration.

Response: Section 2.4.2 has been revised to indicate that prior to conducting sub-slab vapor sampling, a helium leak test will be conducted at each bore hole to verify the seal of each sampling point. In the event that the seal is compromised, the sampling point will be resealed until it passes the helium leak test. A three to four hour waiting time will be used before collection of each sample after sample point installation. Section 2.4.2 now reads as follows:

"*2.4.2* ***<u>Sub-Slab Vapor Sampling</u>***

Prior to conducting sub-slab vapor sampling, a helium leak test will be conducted at each bore hole to verify the seal of each sampling point. In the event that the seal is compromised, the sampling point will be resealed until it passes the helium leak test. A three to four hour waiting time will be used before collection of each sample after sample point installation.

A total of six sub-slab vapor samples will be collected using evacuated summa canisters. Based on historical soil and groundwater data, as discussed in Section 1.1, the greatest potential for TCE in soil is located north, and northwest of Building 146.

As stated for indoor air sampling, summa canisters will operate continuously for 8-hours and will be shipped to the FBL for VOCs analysis following the sampling event. In addition, one duplicate sample will be collected for QA purposes. Table 2-1 lists the sample identification numbers for the sub-slab vapor samples that are proposed for collection, along with their respective general locations. SOP-02 provides a detailed procedure for sub-slab vapor sampling using summa canisters.

At the conclusion of the sub-slab vapor sampling, each indoor air and sub-slab vapor sample location will be triangulated from the corner of each bay area. An updated sample location figure will be provided in the VI report."

SOP-02 has also been revised to include the procedure that will be used to conduct the leak test using helium as a tracer gas. A revised version of SOP-02 is included with this response.

Comment 3:

Referring to Section 2.4.3, the outdoor air sample location should be in a prevailing upwind direction and away from any wind obstructions such as trees and buildings and any contaminated soils. The sampling should begin at least 1 hour and preferably 2 hours before indoor air sampling begins and continue until at least 30 minutes before indoor air sampling is complete.

Response: The second paragraph in Section 2.4.3 has been revised to read as follows:

"One outdoor air sample will be collected along the prevailing upwind direction from Building 146 away from any wind obstructions such as trees and buildings and any contaminated soils. On day scheduled for air sampling, the prevailing wind direction will be determined on the basis of the hourly average wind direction reported at the National Weather Service Bloomington (47401) reporting station. In the event, that hourly wind data is not available from Bloomington, Indianapolis and Terra Haute NWS reporting stations will be used to determine the prevailing wind direction. The outdoor air sampling with begin at least 1-hour prior to the start of indoor air sampling and will continue until at least 30 minutes before indoor air sampling is complete. The wind direction and speed will be recorded for each hour in the log book for the period 1-hour before sampling begins to 1-hour after sampling ends."

Comment 3:

Referring to Section 3.0, this section cites a "Modified" EPA TO-15 procedure. Please provide additional detail on the following issues:

a) If 6-Liter Summa canisters are used (vs 1 liter amber bottles fitted with a gas spigot), how will they be tested for the presence of residual contamination prior to use? Re-used Summa canisters may be very difficult to completely flush.

b) How will the air samples be physically taken? Geoprobe? Soil Gas rods? Etc.

Response:

(a) All canisters used in the sampling program will be "certified clean" by the laboratory. The canisters are hooked to an oven in batches of 8, 6-L canisters. The canisters are evacuated to -30"Hg and then filled with clean humidified nitrogen to 30 psi while being heated to a temperature of 125°C. The process is repeated 5-10 more times until the canister is completely evacuated. One canister is removed and pressurized to 30psi with air. This sample is analyzed by GC/MS for Batch Certification. If the canister meets the criteria, the batch is certified clean and is ready for use.

(b) New Teflon®-lined tubing will be placed down each hole about 2-3 inches below the foundation floor of B-146. Plumber's putty, or a similar VOC-free substance, will be applied to the hole around the tubing to seal the hole, and to minimize disturbance of the sub-slab soil gas concentrations and surface air intrusion. The tubing is attached to a purging pump outside of the hole and three to five tubing volumes are purged into a Tedlar™ bag (to avoid purging into indoor air) to ensure the sample represents subsurface conditions. A pre-evacuated stainless steel canister (6-L) will be attached to the sampling train tubing, and sampled.

Comment 4:

Referring to Section 4, provide additional detail on how the data will be evaluated and conversion calculations made.

Response: The following additional detail has been added to Section 4:

"Multiple lines of evidence will be used to evaluate the magnitude and extent of vapor intrusion at Building 146. Depending on the results of the investigation and a human health risk assessment, it may be determined that either no further action is necessary or that mitigation or remediation may be warranted.

Once the analytical data has been collected, it will be necessary to evaluate the data for site management decision making. The evaluation will utilize a "multiple lines of evidence" approach to assess if the vapor intrusion pathway. The lines of evidence being considered for this project include:

- *Near-slab soil gas data*
- *Indoor air data*
- *Outdoor air samples collected concurrently with indoor air samples*
- *Comparison of constituent ratios of chemicals in soil gas and indoor air*
- *Comparison of analytical results to the USEPA human health project screening levels given in Table 4-1 and determine the level of risk."*

All analytical results reported by the laboratory will be provided in units of "$\mu g/m^3$". As a result, no conversions calculations will be necessary.

Comment 5:

Referring to Table 4-1, the LOQ for TCE exceeds the Project Screening Level for Indoor Air. Is the chosen lab capable of reporting unqualified analytical results for TCE that are below the screening level?

Response: After checking with the laboratory, they indicated that the LOQ for TCE is 0.16 $\mu g/m^3$, which is at least one order of magnitude lower than the Project Screening Level.

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; 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

Toxicity and Chemical-specific						Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
5.1E-06	C					ALAR	1596-84-5	2.4E+00	
						Acephate	30560-19-1		
2.2E-06	I	9.0E-03	I	V		Acetaldehyde	75-07-0	5.6E+00	3.9E+01
						Acetochlor	34256-82-1		
		3.1E+01	A	V		Acetone	67-64-1		1.4E+05
		2.0E-03	X	V		Acetone Cyanohydrin	75-86-5		8.8E+00
		6.0E-02	I	V		Acetonitrile	75-05-8		2.6E+02
				V		Acetophenone	98-86-2		
1.3E-03	C					Acetylaminofluorene, 2-	53-96-3	9.4E-03	
		2.0E-05	I	V		Acrolein	107-02-8		8.8E-02
1.0E-04	I	6.0E-03	I		M	Acrylamide	79-06-1	1.2E-01	2.6E+01
		1.0E-03	I			Acrylic Acid	79-10-7		4.4E+00
6.8E-05	I	2.0E-03	I	V		Acrylonitrile	107-13-1	1.8E-01	8.8E+00
		6.0E-03	P			Adiponitrile	111-69-3		2.6E+01
						Alachlor	15972-60-8		
						Aldicarb	116-06-3		
						Aldicarb Sulfone	1646-88-4		
						Aldicarb sulfoxide	1646-87-3		
4.9E-03	I					Aldrin	309-00-2	2.5E-03	
						Ally	74223-64-6		
		1.0E-04	X			Allyl Alcohol	107-18-6		4.4E-01
6.0E-06	C	1.0E-03	I	V		Allyl Chloride	107-05-1	2.0E+00	4.4E+00
		5.0E-03	P			Aluminum	7429-90-5		2.2E+01
						Aluminum Phosphide	20859-73-8		
						Amdro	67485-29-4		
						Ametryn	834-12-8		
6.0E-03	C					Aminobiphenyl, 4-	92-67-1	2.0E-03	
						Aminophenol, m-	591-27-5		
						Aminophenol, p-	123-30-8		
						Amitraz	33089-61-1		
		1.0E-01	I			Ammonia	7664-41-7		4.4E+02
						Ammonium Sulfamate	7773-06-0		
		3.0E-03	X	V		Amyl Alcohol, tert-	75-85-4		1.3E+01
1.6E-06	C	1.0E-03	I			Aniline	62-53-3	7.7E+00	4.4E+00
						Anthraquinone, 9,10-	84-65-1		
						Antimony (metallic)	7440-36-0		
						Antimony Pentoxide	1314-60-9		
						Antimony Potassium Tartrate	11071-15-1		
						Antimony Tetroxide	1332-81-6		
		2.0E-04	I			Antimony Trioxide	1309-64-4		8.8E-01
						Apollo	74115-24-5		
7.1E-06	I					Aramite	140-57-8	1.7E+00	
4.3E-03	I	1.5E-05	C			Arsenic, Inorganic	7440-38-2	2.9E-03	6.6E-02
		5.0E-05	I			Arsine	7784-42-1		2.2E-01
						Assure	76578-14-8		
						Asulam	3337-71-1		
						Atrazine	1912-24-9		
2.5E-04	C					Auramine	492-80-8	4.9E-02	
						Avermectin B1	65195-55-3		
3.1E-05	I			V		Azobenzene	103-33-3	4.0E-01	
		5.0E-04	H			Barium	7440-39-3		2.2E+00
						Baygon	114-26-1		
						Bayleton	43121-43-3		
						Baythroid	68359-37-5		
						Benefin	1861-40-1		
						Benomyl	17804-35-2		
						Bentazon	25057-89-0		
				V		Benzaldehyde	100-52-7		
7.8E-06	I	3.0E-02	I	V		Benzene	71-43-2	1.6E+00	1.3E+02
						Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1		
				V		Benzenethiol	108-98-5		
6.7E-02	I				M	Benzidine	92-87-5	1.8E-04	
						Benzoic Acid	65-85-0		
				V		Benzotrichloride	98-07-7		
						Benzyl Alcohol	100-51-6		
4.9E-05	C	1.0E-03	P	V		Benzyl Chloride	100-44-7	2.5E-01	4.4E+00
2.4E-03	I	2.0E-05	I			Beryllium and compounds	7440-41-7	5.1E-03	8.8E-02
						Bidrin	141-66-2		
						Bifenox	42576-02-3		
						Biphenthrin	82657-04-3		
		4.0E-04	X	V		Biphenyl, 1,1'-	92-52-4		1.8E+00
1.0E-05	H			V		Bis(2-chloro-1-methylethyl) ether	108-60-1	1.2E+00	
						Bis(2-chloroethoxy)methane	111-91-1		
3.3E-04	I			V		Bis(2-chloroethyl)ether	111-44-4	3.7E-02	
6.2E-02	I			V		Bis(chloromethyl)ether	542-88-1	2.0E-04	

TR=1E-06
HQ=1.0

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; 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

Toxicity and Chemical-specific							Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen		Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
							Bisphenol A	80-05-7		
		2.0E-02	H				Boron And Borates Only	7440-42-8		8.8E+01
		2.0E-02	P				Boron Trichloride	10294-34-5		8.8E+01
		1.3E-02	C				Boron Trifluoride	7637-07-2		5.7E+01
							Bromate	15541-45-4		
6.0E-04	X				V		Bromo-2-chloroethane, 1-	107-04-0	2.0E-02	
		6.0E-02	I	V			Bromobenzene	108-86-1		2.6E+02
		4.0E-02	X	V			Bromochloromethane	74-97-5		1.8E+02
3.7E-05	C				V		Bromodichloromethane	75-27-4	3.3E-01	
1.1E-06	I						Bromoform	75-25-2	1.1E+01	
		5.0E-03	I	V			Bromomethane	74-83-9		2.2E+01
							Bromophos	2104-96-3		
							Bromoxynil	1689-84-5		
							Bromoxynil Octanoate	1689-99-2		
3.0E-05	I	2.0E-03	I	V			Butadiene, 1,3-	106-99-0	4.1E-01	8.8E+00
							Butanol, N-	71-36-3		
							Butyl Benzyl Phthlate	85-68-7		
		3.0E+01	P				Butyl alcohol, sec-	78-92-2		1.3E+05
							Butylate	2008-41-5		
5.7E-08	C						Butylated hydroxyanisole	25013-16-5	2.2E+02	
							Butylated hydroxytoluene	128-37-0		
					V		Butylbenzene, n-	104-51-8		
					V		Butylbenzene, sec-	135-98-8		
					V		Butylbenzene, tert-	98-06-6		
							Cacodylic Acid	75-60-5		
1.8E-03	I	1.0E-05	A				Cadmium (Diet)	7440-43-9		
1.8E-03	I	1.0E-05	A				Cadmium (Water)	7440-43-9	6.8E-03	4.4E-02
		2.2E-03	C				Caprolactam	105-60-2		9.6E+00
4.3E-05	C						Captafol	2425-06-1	2.9E-01	
6.6E-07	C						Captan	133-06-2	1.9E+01	
							Carbaryl	63-25-2		
							Carbofuran	1563-66-2		
		7.0E-01	I	V			Carbon Disulfide	75-15-0		3.1E+03
6.0E-06	I	1.0E-01	I	V			Carbon Tetrachloride	56-23-5	2.0E+00	4.4E+02
							Carbosulfan	55285-14-8		
							Carboxin	5234-68-4		
		9.0E-04	I				Ceric oxide	1306-38-3		3.9E+00
							Chloral Hydrate	302-17-0		
							Chloramben	133-90-4		
							Chloranil	118-75-2		
1.0E-04	I	7.0E-04	I				Chlordane	12789-03-6	1.2E-01	3.1E+00
4.6E-03	C						Chlordecone (Kepone)	143-50-0	2.7E-03	
							Chlorfenvinphos	470-90-6		
							Chlorimuron, Ethyl-	90982-32-4		
		1.5E-04	A				Chlorine	7782-50-5		6.4E-01
		2.0E-04	I				Chlorine Dioxide	10049-04-4		8.8E-01
							Chlorite (Sodium Salt)	7758-19-2		
		5.0E+01	I	V			Chloro-1,1-difluoroethane, 1-	75-68-3		2.2E+05
3.0E-04	I	2.0E-02	I	V			Chloro-1,3-butadiene, 2-	126-99-8	4.1E-02	8.8E+01
							Chloro-2-methylaniline HCl, 4-	3165-93-3		
7.7E-05	C						Chloro-2-methylaniline, 4-	95-69-2	1.6E-01	
					V		Chloroacetaldehyde, 2-	107-20-0		
							Chloroacetic Acid	79-11-8		
		3.0E-05	I				Chloroacetophenone, 2-	532-27-4		1.3E-01
							Chloroaniline, p-	106-47-8		
		5.0E-02	P	V			Chlorobenzene	108-90-7		2.2E+02
3.1E-05	C						Chlorobenzilate	510-15-6	4.0E-01	
							Chlorobenzoic Acid, p-	74-11-3		
		3.0E-01	P	V			Chlorobenzotrifluoride, 4-	98-56-6		1.3E+03
				V			Chlorobutane, 1-	109-69-3		
		5.0E+01	I	V			Chlorodifluoromethane	75-45-6		2.2E+05
							Chloroethanol, 2-	107-07-3		
2.3E-05	I	9.8E-02	A	V			Chloroform	67-66-3	5.3E-01	4.3E+02
		9.0E-02	I	V			Chloromethane	74-87-3		3.9E+02
6.9E-04	C				V		Chloromethyl Methyl Ether	107-30-2	1.8E-02	
		1.0E-05	X				Chloronitrobenzene, o-	88-73-3		4.4E-02
		6.0E-04	P				Chloronitrobenzene, p-	100-00-5		2.6E+00
					V		Chlorophenol, 2-	95-57-8		
		4.0E-04	C	V			Chloropicrin	76-06-2		1.8E+00
8.9E-07	C						Chlorothalonil	1897-45-6	1.4E+01	
					V		Chlorotoluene, o-	95-49-8		
					V		Chlorotoluene, p-	106-43-4		
6.9E-02	C						Chlorozotocin	54749-90-5	1.8E-04	
							Chlorpropham	101-21-3		
							Chlorpyrifos	2921-88-2		

TR=1E-06
HQ=1.0

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Toxicity and Chemical-specific						Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
						Chlorpyrifos Methyl	5598-13-0		
						Chlorsulfuron	64902-72-3		
						Chlorthiophos	60238-56-4		
						Chromium(III), Insoluble Salts	16065-83-1		
8.4E-02	S	1.0E-04	I		M	Chromium(VI)	18540-29-9	1.5E-04	4.4E-01
						Chromium, Total	7440-47-3		
9.0E-03	P	6.0E-06	P			Cobalt	7440-48-4	1.4E-03	2.6E-02
6.2E-04	I				M	Coke Oven Emissions	8007-45-2	2.0E-02	
						Copper	7440-50-8		
		6.0E-01	C			Cresol, m-	108-39-4		2.6E+03
		6.0E-01	C			Cresol, o-	95-48-7		2.6E+03
		6.0E-01	C			Cresol, p-	106-44-5		2.6E+03
						Cresol, p-chloro-m-	59-50-7		
		6.0E-01	C			Cresols	1319-77-3		2.6E+03
				V		Crotonaldehyde, trans-	123-73-9		
		4.0E-01	I	V		Cumene	98-82-8		1.8E+03
6.3E-05	C					Cupferron	135-20-6	1.9E-01	
						Cyanazine	21725-46-2		
						Cyanides			
						~Calcium Cyanide	592-01-8		
						~Copper Cyanide	544-92-3		
		8.0E-04	S	V		~Cyanide (CN-)	57-12-5		3.5E+00
				V		~Cyanogen	460-19-5		
				V		~Cyanogen Bromide	506-68-3		
				V		~Cyanogen Chloride	506-77-4		
		8.0E-04	I	V		~Hydrogen Cyanide	74-90-8		3.5E+00
						~Potassium Cyanide	151-50-8		
						~Potassium Silver Cyanide	506-61-6		
						~Silver Cyanide	506-64-9		
						~Sodium Cyanide	143-33-9		
						~Thiocyanates	NA		
						~Thiocyanic Acid	463-56-9		
						~Zinc Cyanide	557-21-1		
		6.0E+00	I	V		Cyclohexane	110-82-7		2.6E+04
						Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3		
		7.0E-01	P			Cyclohexanone	108-94-1		3.1E+03
		1.0E+00	X	V		Cyclohexene	110-83-8		4.4E+03
						Cyclohexylamine	108-91-8		
						Cyhalothrin/karate	68085-85-8		
						Cypermethrin	52315-07-8		
						Cyromazine	66215-27-8		
6.9E-05	C					DDD	72-54-8	1.8E-01	
9.7E-05	C					DDE, p,p'-	72-55-9	1.3E-01	
9.7E-05	I					DDT	50-29-3	1.3E-01	
						Dacthal	1861-32-1		
						Dalapon	75-99-0		
						Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5		
						Demeton	8065-48-3		
						Di(2-ethylhexyl)adipate	103-23-1		
						Diallate	2303-16-4		
						Diazinon	333-41-5		
				V		Dibenzothiophene	132-65-0		
6.0E-03	P	2.0E-04	I	V	M	Dibromo-3-chloropropane, 1,2-	96-12-8	2.0E-03	8.8E-01
						Dibromobenzene, 1,4-	106-37-6		
2.7E-05	C			V		Dibromochloromethane	124-48-1	4.5E-01	
6.0E-04	I	9.0E-03	I	V		Dibromoethane, 1,2-	106-93-4	2.0E-02	3.9E+01
		4.0E-03	X	V		Dibromomethane (Methylene Bromide)	74-95-3		1.8E+01
						Dibutyltin Compounds	NA		
						Dicamba	1918-00-9		
4.2E-03	P			V		Dichloro-2-butene, 1,4-	764-41-0	2.9E-03	
4.2E-03	P			V		Dichloro-2-butene, cis-1,4-	1476-11-5	2.9E-03	
4.2E-03	P			V		Dichloro-2-butene, trans-1,4-	110-57-6	2.9E-03	
						Dichloroacetic Acid	79-43-6		
		2.0E-01	H	V		Dichlorobenzene, 1,2-	95-50-1		8.8E+02
1.1E-05	C	8.0E-01	I	V		Dichlorobenzene, 1,4-	106-46-7	1.1E+00	3.5E+03
3.4E-04	C					Dichlorobenzidine, 3,3'-	91-94-1	3.6E-02	
						Dichlorobenzophenone, 4,4'-	90-98-2		
		1.0E-01	X	V		Dichlorodifluoromethane	75-71-8		4.4E+02
1.6E-06	C			V		Dichloroethane, 1,1-	75-34-3	7.7E+00	
2.6E-05	I	7.0E-03	P	V		Dichloroethane, 1,2-	107-06-2	4.7E-01	3.1E+01
		2.0E-01	I	V		Dichloroethylene, 1,1-	75-35-4		8.8E+02
				V		Dichloroethylene, 1,2- (Mixed Isomers)	540-59-0		
				V		Dichloroethylene, 1,2-cis-	156-59-2		
		6.0E-02	P	V		Dichloroethylene, 1,2-trans-	156-60-5		2.6E+02
						Dichlorophenol, 2,4-	120-83-2		

TR=1E-06
HQ=1.0

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Toxicity and Chemical-specific						Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
						Dichlorophenoxy Acetic Acid, 2,4-	94-75-7		
						Dichlorophenoxy)butyric Acid, 4-(2,4-	94-82-6		
1.0E-05	C	4.0E-03	I	V		Dichloropropane, 1,2-	78-87-5	1.2E+00	1.8E+01
				V		Dichloropropane, 1,3-	142-28-9		
						Dichloropropanol, 2,3-	616-23-9		
4.0E-06	I	2.0E-02	I	V		Dichloropropene, 1,3-	542-75-6	3.1E+00	8.8E+01
8.3E-05	C	5.0E-04	I			Dichlorvos	62-73-7	1.5E-01	2.2E+00
		7.0E-03	P	V		Dicyclopentadiene	77-73-6		3.1E+01
4.6E-03	I					Dieldrin	60-57-1	2.7E-03	
3.0E-04	C	5.0E-03	I			Diesel Engine Exhaust	NA	4.1E-02	2.2E+01
		2.0E-04	P			Diethanolamine	111-42-2		8.8E-01
		1.0E-04	P			Diethylene Glycol Monobutyl Ether	112-34-5		4.4E-01
		3.0E-04	P			Diethylene Glycol Monoethyl Ether	111-90-0		1.3E+00
						Diethylformamide	617-84-5		
1.0E-01	C					Diethylstilbestrol	56-53-1	1.2E-04	
						Difenzoquat	43222-48-6		
						Diflubenzuron	35367-38-5		
		4.0E+01	I	V		Difluoroethane, 1,1-	75-37-6		1.8E+05
1.3E-05	C			V		Dihydrosafrole	94-58-6	9.4E-01	
		7.0E-01	P	V		Diisopropyl Ether	108-20-3		3.1E+03
				V		Diisopropyl Methylphosphonate	1445-75-6		
						Dimethipin	55290-64-7		
						Dimethoate	60-51-5		
						Dimethoxybenzidine, 3,3'-	119-90-4		
						Dimethyl methylphosphonate	756-79-6		
1.3E-03	C					Dimethylamino azobenzene [p-]	60-11-7	9.4E-03	
						Dimethylaniline HCl, 2,4-	21436-96-4		
						Dimethylaniline, 2,4-	95-68-1		
				V		Dimethylaniline, N,N-	121-69-7		
						Dimethylbenzidine, 3,3'-	119-93-7		
		3.0E-02	I			Dimethylformamide	68-12-2		1.3E+02
		2.0E-06	X			Dimethylhydrazine, 1,1-	57-14-7		8.8E-03
1.6E-01	C					Dimethylhydrazine, 1,2-	540-73-8	7.7E-05	
						Dimethylphenol, 2,4-	105-67-9		
						Dimethylphenol, 2,6-	576-26-1		
						Dimethylphenol, 3,4-	95-65-8		
1.3E-05	C			V		Dimethylvinylchloride	513-37-1	9.4E-01	
						Dinitro-o-cresol, 4,6-	534-52-1		
						Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5		
						Dinitrobenzene, 1,2-	528-29-0		
						Dinitrobenzene, 1,3-	99-65-0		
						Dinitrobenzene, 1,4-	100-25-4		
						Dinitrophenol, 2,4-	51-28-5		
						Dinitrotoluene Mixture, 2,4/2,6-	NA		
8.9E-05	C					Dinitrotoluene, 2,4-	121-14-2	1.4E-01	
						Dinitrotoluene, 2,6-	606-20-2		
						Dinitrotoluene, 2-Amino-4,6-	35572-78-2		
						Dinitrotoluene, 4-Amino-2,6-	19406-51-0		
						Dinitrotoluene, Technical grade	25321-14-6		
						Dinoseb	88-85-7		
5.0E-06	I	3.0E-02	I			Dioxane, 1,4-	123-91-1	2.5E+00	1.3E+02
						Dioxins			
1.3E+00	I					~Hexachlorodibenzo-p-dioxin, Mixture	NA	9.4E-06	
3.8E+01	C	4.0E-08	C			~TCDD, 2,3,7,8-	1746-01-6	3.2E-07	1.8E-04
						Diphenamid	957-51-7		
						Diphenyl Sulfone	127-63-9		
						Diphenylamine	122-39-4		
2.2E-04	I					Diphenylhydrazine, 1,2-	122-66-7	5.6E-02	
						Diquat	85-00-7		
2.1E-03	C					Direct Black 38	1937-37-7	5.8E-03	
2.1E-03	C					Direct Blue 6	2602-46-2	5.8E-03	
1.9E-03	C					Direct Brown 95	16071-86-6	6.5E-03	
						Disulfoton	298-04-4		
				V		Dithiane, 1,4-	505-29-3		
						Diuron	330-54-1		
						Dodine	2439-10-3		
				V		EPTC	759-94-4		
						Endosulfan	115-29-7		
						Endothall	145-73-3		
						Endrin	72-20-8		
1.2E-06	I	1.0E-03	I	V		Epichlorohydrin	106-89-8	1.0E+01	4.4E+00
		2.0E-02	I	V		Epoxybutane, 1,2-	106-88-7		8.8E+01
						Ethephon	16672-87-0		
						Ethion	563-12-2		
		6.0E-02	P			Ethoxyethanol Acetate, 2-	111-15-9		2.6E+02

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Toxicity and Chemical-specific							Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	volc	muta-gen		Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
		2.0E-01	I				Ethoxyethanol, 2-	110-80-5		8.8E+02
		7.0E-02	P	V			Ethyl Acetate	141-78-6		3.1E+02
				V			Ethyl Acrylate	140-88-5		
		1.0E+01	I	V			Ethyl Chloride (Chloroethane)	75-00-3		4.4E+04
				V			Ethyl Ether	60-29-7		
		3.0E-01	P	V			Ethyl Methacrylate	97-63-2		1.3E+03
							Ethyl-p-nitrophenyl Phosphonate	2104-64-5		
2.5E-06	C	1.0E+00	I	V			Ethylbenzene	100-41-4	4.9E+00	4.4E+03
							Ethylene Cyanohydrin	109-78-4		
							Ethylene Diamine	107-15-3		
		4.0E-01	C				Ethylene Glycol	107-21-1		1.8E+03
		1.6E+00	I				Ethylene Glycol Monobutyl Ether	111-76-2		7.0E+03
8.8E-05	C	3.0E-02	C	V			Ethylene Oxide	75-21-8	1.4E-01	1.3E+02
1.3E-05	C						Ethylene Thiourea	96-45-7	9.4E-01	
1.9E-02	C			V			Ethyleneimine	151-56-4	6.5E-04	
							Ethylphthalyl Ethyl Glycolate	84-72-0		
							Express	101200-48-0		
							Fenamiphos	22224-92-6		
							Fenpropathrin	39515-41-8		
							Fluometuron	2164-17-2		
		1.3E-02	C				Fluoride	16984-48-8		5.7E+01
		1.3E-02	C				Fluorine (Soluble Fluoride)	7782-41-4		5.7E+01
							Fluridone	59756-60-4		
							Flurprimidol	56425-91-3		
							Flutolanil	66332-96-5		
							Fluvalinate	69409-94-5		
							Folpet	133-07-3		
							Fomesafen	72178-02-0		
							Fonofos	944-22-9		
1.3E-05	I	9.8E-03	A				Formaldehyde	50-00-0	9.4E-01	4.3E+01
		3.0E-04	X				Formic Acid	64-18-6		1.3E+00
							Fosetyl-AL	39148-24-8		
							Furans			
				V			~Dibenzofuran	132-64-9		
				V			~Furan	110-00-9		
		2.0E+00	I	V			~Tetrahydrofuran	109-99-9		8.8E+03
							Furazolidone	67-45-8		
		5.0E-02	H				Furfural	98-01-1		2.2E+02
4.3E-04	C						Furium	531-82-8	2.9E-02	
8.6E-06	C						Furmecyclox	60568-05-0	1.4E+00	
							Glufosinate, Ammonium	77182-82-2		
		8.0E-05	C				Glutaraldehyde	111-30-8		3.5E-01
		1.0E-03	H				Glycidyl	765-34-4		4.4E+00
							Glyphosate	1071-83-6		
							Goal	42874-03-3		
		1.0E-02	A				Guthion	86-50-0		4.4E+01
							Haloxyfop, Methyl	69806-40-2		
							Harmony	79277-27-3		
1.3E-03	I						Heptachlor	76-44-8	9.4E-03	
2.6E-03	I						Heptachlor Epoxide	1024-57-3	4.7E-03	
							Hexabromobenzene	87-82-1		
							Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2		
4.6E-04	I						Hexachlorobenzene	118-74-1	2.7E-02	
2.2E-05	I						Hexachlorobutadiene	87-68-3	5.6E-01	
1.8E-03	I						Hexachlorocyclohexane, Alpha-	319-84-6	6.8E-03	
5.3E-04	I						Hexachlorocyclohexane, Beta-	319-85-7	2.3E-02	
3.1E-04	C						Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	4.0E-02	
5.1E-04	I						Hexachlorocyclohexane, Technical	608-73-1	2.4E-02	
		2.0E-04	I				Hexachlorocyclopentadiene	77-47-4		8.8E-01
1.1E-05	C	3.0E-02	I				Hexachloroethane	67-72-1	1.1E+00	1.3E+02
							Hexachlorophene	70-30-4		
							Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4		
		1.0E-05	I	V			Hexamethylene Diisocyanate, 1,6-	822-06-0		4.4E-02
							Hexamethylphosphoramide	680-31-9		
		7.0E-01	I	V			Hexane, N-	110-54-3		3.1E+03
							Hexanedioic Acid	124-04-9		
		3.0E-02	I	V			Hexanone, 2-	591-78-6		1.3E+02
							Hexazinone	51235-04-2		
4.9E-03	I	3.0E-05	P				Hydrazine	302-01-2	2.5E-03	1.3E-01
4.9E-03	I						Hydrazine Sulfate	10034-93-2	2.5E-03	
		2.0E-02	I				Hydrogen Chloride	7647-01-0		8.8E+01
		1.4E-02	C				Hydrogen Fluoride	7664-39-3		6.1E+01
		2.0E-03	I				Hydrogen Sulfide	7783-06-4		8.8E+00
							Hydroquinone	123-31-9		
							Imazalil	35554-44-0		

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Toxicity and Chemical-specific					Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
						Imazaquin	81335-37-7		
						Iodine	7553-56-2		
						Iprodione	36734-19-7		
						Iron	7439-89-6		
						Isobutyl Alcohol	78-83-1		
		2.0E+00	C			Isophorone	78-59-1		8.8E+03
						Isopropalin	33820-53-0		
		7.0E+00	C			Isopropanol	67-63-0		3.1E+04
						Isopropyl Methyl Phosphonic Acid	1832-54-8		
						Isoxaben	82558-50-7		
		3.0E-01	A	V		JP-7	NA		1.3E+03
						Kerb	23950-58-5		
						Lactofen	77501-63-4		
						Lead Compounds			
8.0E-05	C					~Lead acetate	301-04-2	1.5E-01	
						~Lead and Compounds	7439-92-1		
1.1E-05	C					~Lead subacetate	1335-32-6	1.1E+00	
						~Tetraethyl Lead	78-00-2		
						Linuron	330-55-2		
						Lithium	7439-93-2		
						Londax	83055-99-6		
						MCPA	94-74-6		
						MCPB	94-81-5		
						MCPP	93-65-2		
						Malathion	121-75-5		
		7.0E-04	C			Maleic Anhydride	108-31-6		3.1E+00
						Maleic Hydrazide	123-33-1		
						Malononitrile	109-77-3		
						Mancozeb	8018-01-7		
						Maneb	12427-38-2		
		5.0E-05	I			Manganese (Diet)	7439-96-5		
		5.0E-05	I			Manganese (Non-diet)	7439-96-5		2.2E-01
						Mephosfolan	950-10-7		
						Mepiquat Chloride	24307-26-4		
						Mercury Compounds			
		3.0E-04	S			~Mercuric Chloride (and other Mercury salts)	7487-94-7		1.3E+00
		3.0E-04	I	V		~Mercury (elemental)	7439-97-6		1.3E+00
						~Methyl Mercury	22967-92-6		
						~Phenylmercuric Acetate	62-38-4		
						Merphos	150-50-5		
						Merphos Oxide	78-48-8		
						Metalaxyl	57837-19-1		
		3.0E-02	P	V		Methacrylonitrile	126-98-7		1.3E+02
						Methamidophos	10265-92-6		
		2.0E+01	I			Methanol	67-56-1		8.8E+04
						Methidathion	950-37-8		
						Methomyl	16752-77-5		
1.4E-05	C					Methoxy-5-nitroaniline, 2-	99-59-2	8.8E-01	
						Methoxychlor	72-43-5		
		1.0E-03	P			Methoxyethanol Acetate, 2-	110-49-6		4.4E+00
		2.0E-02	I			Methoxyethanol, 2-	109-86-4		8.8E+01
				V		Methyl Acetate	79-20-9		
		2.0E-02	P	V		Methyl Acrylate	96-33-3		8.8E+01
		5.0E+00	I	V		Methyl Ethyl Ketone (2-Butanone)	78-93-3		2.2E+04
1.0E-03	X	2.0E-05	X			Methyl Hydrazine	60-34-4	1.2E-02	8.8E-02
		3.0E+00	I	V		Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1		1.3E+04
		1.0E-03	C	V		Methyl Isocyanate	624-83-9		4.4E+00
		7.0E-01	I	V		Methyl Methacrylate	80-62-6		3.1E+03
						Methyl Parathion	298-00-0		
						Methyl Phosphonic Acid	993-13-5		
		4.0E-02	H	V		Methyl Styrene (Mixed Isomers)	25013-15-4		1.8E+02
2.8E-05	C					Methyl methanesulfonate	66-27-3	4.4E-01	
2.6E-07	C	3.0E+00	I	V		Methyl tert-Butyl Ether (MTBE)	1634-04-4	4.7E+01	1.3E+04
						Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2		
						Methyl-5-Nitroaniline, 2-	99-55-8		
2.4E-03	C					Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	5.1E-03	
3.7E-05	C					Methylaniline Hydrochloride, 2-	636-21-5	3.3E-01	
						Methylarsonic acid	124-58-3		
						Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7		
						Methylbenzene-1,4-diamine sulfate, 2-	615-50-9		
6.3E-03	C				M	Methylcholanthrene, 3-	56-49-5	1.9E-03	
1.0E-08	I	6.0E-01	I	V	M	Methylene Chloride	75-09-2	1.2E+03	2.6E+03
4.3E-04	C				M	Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	2.9E-02	
1.3E-05	C					Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	9.4E-01	
4.6E-04	C	2.0E-02	C			Methylenebisbenzenamine, 4,4'-	101-77-9	2.7E-02	8.8E+01

TR = 1E-06
HQ = 1.0

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Toxicity and Chemical-specific							Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	volc	muta-gen		Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
		6.0E-04	I				Methylenediphenyl Diisocyanate	101-68-8		2.6E+00
				V			Methylstyrene, Alpha-	98-83-9		
							Metolachlor	51218-45-2		
							Metribuzin	21087-64-9		
				V			Mineral oils	8012-95-1		
5.1E-03	C						Mirex	2385-85-5	2.4E-03	
							Molinate	2212-67-1		
							Molybdenum	7439-98-7		
							Monochloramine	10599-90-3		
							Monomethylaniline	100-61-8		
							N,N'-Diphenyl-1,4-benzenediamine	74-31-7		
							Naled	300-76-5		
		1.0E-01	P	V			Naphtha, High Flash Aromatic (HFAN)	64724-95-6		4.4E+02
0.0E+00	C						Naphthylamine, 2-	91-59-8		
							Napropamide	15299-99-7		
		1.4E-05	C				Nickel Carbonyl	13463-39-3		6.1E-02
		2.0E-05	C				Nickel Oxide	1313-99-1		8.8E-02
2.4E-04	I	1.4E-05	C				Nickel Refinery Dust	NA	5.1E-02	6.1E-02
2.6E-04	C	9.0E-05	A				Nickel Soluble Salts	7440-02-0	4.7E-02	3.9E-01
4.8E-04	I	1.4E-05	C				Nickel Subsulfide	12035-72-2	2.6E-02	6.1E-02
							Nitrate	14797-55-8		
							Nitrate + Nitrite (as N)	NA		
							Nitrite	14797-65-0		
		5.0E-05	X				Nitroaniline, 2-	88-74-4		2.2E-01
		6.0E-03	P				Nitroaniline, 4-	100-01-6		2.6E+01
4.0E-05	I	9.0E-03	I	V			Nitrobenzene	98-95-3	3.1E-01	3.9E+01
							Nitrocellulose	9004-70-0		
							Nitrofurantoin	67-20-9		
3.7E-04	C						Nitrofurazone	59-87-0	3.3E-02	
							Nitroglycerin	55-63-0		
							Nitroguanidine	556-88-7		
8.8E-06	P	5.0E-03	P	V			Nitromethane	75-52-5	1.4E+00	2.2E+01
2.7E-03	H	2.0E-02	I	V			Nitropropane, 2-	79-46-9	4.5E-03	8.8E+01
7.7E-03	C					M	Nitroso-N-ethylurea, N-	759-73-9	1.6E-03	
3.4E-02	C					M	Nitroso-N-methylurea, N-	684-93-5	3.6E-04	
1.6E-03	I			V			Nitroso-di-N-butylamine, N-	924-16-3	7.7E-03	
2.0E-03	C						Nitroso-di-N-propylamine, N-	621-64-7	6.1E-03	
8.0E-04	C						Nitrosodiethanolamine, N-	1116-54-7	1.5E-02	
4.3E-02	I					M	Nitrosodiethylamine, N-	55-18-5	2.9E-04	
1.4E-02	I	4.0E-05	X			M	Nitrosodimethylamine, N-	62-75-9	8.8E-04	1.8E-01
2.6E-06	C						Nitrosodiphenylamine, N-	86-30-6	4.7E+00	
6.3E-03	C						Nitrosomethylethylamine, N-	10595-95-6	1.9E-03	
1.9E-03	C						Nitrosomorpholine [N-]	59-89-2	6.5E-03	
2.7E-03	C						Nitrosopiperidine [N-]	100-75-4	4.5E-03	
6.1E-04	I						Nitrosopyrrolidine, N-	930-55-2	2.0E-02	
							Nitrotoluene, m-	99-08-1		
				V			Nitrotoluene, o-	88-72-2		
							Nitrotoluene, p-	99-99-0		
		2.0E-02	P	V			Nonane, n-	111-84-2		8.8E+01
							Norflurazon	27314-13-2		
							Nustar	85509-19-9		
							Octabromodiphenyl Ether	32536-52-0		
							Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0		
							Octamethylpyrophosphoramide	152-16-9		
							Oryzalin	19044-88-3		
							Oxadiazon	19666-30-9		
							Oxamyl	23135-22-0		
							Paclobutrazol	76738-62-0		
							Paraquat Dichloride	1910-42-5		
							Parathion	56-38-2		
							Pebulate	1114-71-2		
							Pendimethalin	40487-42-1		
							Pentabromodiphenyl Ether	32534-81-9		
							Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9		
							Pentachlorobenzene	608-93-5		
							Pentachloroethane	76-01-7		
							Pentachloronitrobenzene	82-68-8		
5.1E-06	C						Pentachlorophenol	87-86-5	2.4E+00	
							Pentaerythritol tetranitrate (PETN)	78-11-5		
		1.0E+00	P	V			Pentane, n-	109-66-0		4.4E+03
							Perchlorates			
							~Ammonium Perchlorate	7790-98-9		
							~Lithium Perchlorate	7791-03-9		
							~Perchlorate and Perchlorate Salts	14797-73-0		
							~Potassium Perchlorate	7778-74-7		

TR=1E-06
HQ=1.0

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Toxicity and Chemical-specific						Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
						~Sodium Perchlorate	7601-89-0		
						Permethrin	52645-53-1		
6.3E-07	C					Phenacetin	62-44-2	1.9E+01	
						Phenmedipham	13684-63-4		
		2.0E-01	C			Phenol	108-95-2		8.8E+02
						Phenothiazine	92-84-2		
						Phenylenediamine, m-	108-45-2		
						Phenylenediamine, o-	95-54-5		
						Phenylenediamine, p-	106-50-3		
						Phenylphenol, 2-	90-43-7		
						Phorate	298-02-2		
		3.0E-04	I	V		Phosgene	75-44-5		1.3E+00
						Phosmet	732-11-6		
						Phosphates, Inorganic			
						~Aluminum metaphosphate	13776-88-0		
						~Ammonium polyphosphate	68333-79-9		
						~Calcium pyrophosphate	7790-76-3		
						~Diammonium phosphate	7783-28-0		
						~Dicalcium phosphate	7757-93-9		
						~Dimagnesium phosphate	7782-75-4		
						~Dipotassium phosphate	7758-11-4		
						~Disodium phosphate	7558-79-4		
						~Monoaluminum phosphate	13530-50-2		
						~Monoammonium phosphate	7722-76-1		
						~Monocalcium phosphate	7758-23-8		
						~Monomagnesium phosphate	7757-86-0		
						~Monopotassium phosphate	7778-77-0		
						~Monosodium phosphate	7558-80-7		
						~Polyphosphoric acid	8017-16-1		
						~Potassium tripolyphosphate	13845-36-8		
						~Sodium acid pyrophosphate	7758-16-9		
						~Sodium aluminum phosphate (acidic)	7785-88-8		
						~Sodium aluminum phosphate (anhydrous)	10279-59-1		
						~Sodium aluminum phosphate (tetrahydrate)	10305-76-7		
						~Sodium hexametaphosphate	10124-56-8		
						~Sodium polyphosphate	68915-31-1		
						~Sodium trimetaphosphate	7785-84-4		
						~Sodium tripolyphosphate	7758-29-4		
						~Tetrapotassium phosphate	7320-34-5		
						~Tetrasodium pyrophosphate	7722-88-5		
						~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5		
						~Tricalcium phosphate	7758-87-4		
						~Trimagnesium phosphate	7757-87-1		
						~Tripotassium phosphate	7778-53-2		
						~Trisodium phosphate	7601-54-9		
		3.0E-04	I			Phosphine	7803-51-2		1.3E+00
		1.0E-02	I			Phosphoric Acid	7664-38-2		4.4E+01
						Phosphorus, White	7723-14-0		
						Phthalates			
2.4E-06	C					~Bis(2-ethylhexyl)phthalate	117-81-7	5.1E+00	
						~Butylphthalyl Butylglycolate	85-70-1		
						~Dibutyl Phthalate	84-74-2		
						~Diethyl Phthalate	84-66-2		
				V		~Dimethylterephthalate	120-61-6		
						~Octyl Phthalate, di-N-	117-84-0		
						~Phthalic Acid, P-	100-21-0		
		2.0E-02	C			~Phthalic Anhydride	85-44-9		8.8E+01
						Picloram	1918-02-1		
						Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3		
						Pirimiphos, Methyl	29232-93-7		
8.6E-03	C					Polybrominated Biphenyls	59536-65-1	1.4E-03	
						Polychlorinated Biphenyls (PCBs)			
2.0E-05	S					~Aroclor 1016	12674-11-2	6.1E-01	
5.7E-04	S			V		~Aroclor 1221	11104-28-2	2.1E-02	
5.7E-04	S			V		~Aroclor 1232	11141-16-5	2.1E-02	
5.7E-04	S					~Aroclor 1242	53469-21-9	2.1E-02	
5.7E-04	S					~Aroclor 1248	12672-29-6	2.1E-02	
5.7E-04	S					~Aroclor 1254	11097-69-1	2.1E-02	
5.7E-04	S					~Aroclor 1260	11096-82-5	2.1E-02	
1.1E-03	E	1.3E-03	E			~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.1E-02	5.8E+00
1.1E-03	E	1.3E-03	E			~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.1E-02	5.8E+00
1.1E-03	E	1.3E-03	E			~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.1E-02	5.8E+00
1.1E-03	E	1.3E-03	E			~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	1.1E-02	5.8E+00
1.1E+00	E	1.3E-06	E			~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.1E-05	5.8E-03
1.1E-03	E	1.3E-03	E			~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.1E-02	5.8E+00

THQ=1.0 TR=1E-06

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Toxicity and Chemical-specific							Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen		Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
1.1E-03	E	1.3E-03	E				~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.1E-02	5.8E+00
1.1E-03	E	1.3E-03	E				~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.1E-02	5.8E+00
1.1E-03	E	1.3E-03	E				~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.1E-02	5.8E+00
3.8E+00	E	4.0E-07	E				~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	3.2E-06	1.8E-03
5.7E-04	I						~Polychlorinated Biphenyls (high risk)	1336-36-3	2.1E-02	
1.0E-04	I						~Polychlorinated Biphenyls (low risk)	1336-36-3	1.2E-01	
2.0E-05	I						~Polychlorinated Biphenyls (lowest risk)	1336-36-3	6.1E-01	
3.8E-03	E	4.0E-04	E				~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	3.2E-03	1.8E+00
1.1E-02	E	1.3E-04	E				~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.1E-03	5.8E-01
		6.0E-04	I				Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9		2.6E+00
							Polynuclear Aromatic Hydrocarbons (PAHs)			
				V			~Acenaphthene	83-32-9		
				V			~Anthracene	120-12-7		
1.1E-04	C				M		~Benz[a]anthracene	56-55-3	1.1E-01	
1.1E-04	C						~Benzo(j)fluoranthene	205-82-3	1.1E-01	
1.1E-03	C				M		~Benzo[a]pyrene	50-32-8	1.1E-02	
1.1E-04	C				M		~Benzo[b]fluoranthene	205-99-2	1.1E-01	
1.1E-04	C				M		~Benzo[k]fluoranthene	207-08-9	1.1E-01	
				V			~Chloronaphthalene, Beta-	91-58-7		
1.1E-05	C				M		~Chrysene	218-01-9	1.1E+00	
1.2E-03	C				M		~Dibenz[a,h]anthracene	53-70-3	1.0E-02	
1.1E-03	C						~Dibenzo(a,e)pyrene	192-65-4	1.1E-02	
7.1E-02	C				M		~Dimethylbenz(a)anthracene, 7,12-	57-97-6	1.7E-04	
							~Fluoranthene	206-44-0		
				V			~Fluorene	86-73-7		
1.1E-04	C				M		~Indeno[1,2,3-cd]pyrene	193-39-5	1.1E-01	
				V			~Methylnaphthalene, 1-	90-12-0		
				V			~Methylnaphthalene, 2-	91-57-6		
3.4E-05	C	3.0E-03	I	V			~Naphthalene	91-20-3	3.6E-01	1.3E+01
1.1E-04	C						~Nitropyrene, 4-	57835-92-4	1.1E-01	
				V			~Pyrene	129-00-0		
							Prochloraz	67747-09-5		
							Profluralin	26399-36-0		
							Prometon	1610-18-0		
							Prometryn	7287-19-6		
							Propachlor	1918-16-7		
							Propanil	709-98-8		
							Propargite	2312-35-8		
							Propargyl Alcohol	107-19-7		
							Propazine	139-40-2		
							Propham	122-42-9		
							Propiconazole	60207-90-1		
		8.0E-03	I	V			Propionaldehyde	123-38-6		3.5E+01
		1.0E+00	X	V			Propyl benzene	103-65-1		4.4E+03
		3.0E+00	C	V			Propylene	115-07-1		1.3E+04
							Propylene Glycol	57-55-6		
		2.7E-04	A				Propylene Glycol Dinitrate	6423-43-4		1.2E+00
							Propylene Glycol Monoethyl Ether	1569-02-4		
		2.0E+00	I				Propylene Glycol Monomethyl Ether	107-98-2		8.8E+03
3.7E-06	I	3.0E-02	I	V			Propylene Oxide	75-56-9	3.3E+00	1.3E+02
							Pursuit	81335-77-5		
							Pydrin	51630-58-1		
				V			Pyridine	110-86-1		
							Quinalphos	13593-03-8		
							Quinoline	91-22-5		
		3.0E-02	A				Refractory Ceramic Fibers	NA		1.3E+02
							Resmethrin	10453-86-8		
							Ronnel	299-84-3		
							Rotenone	83-79-4		
6.3E-05	C				M		Safrole	94-59-7	1.9E-01	
							Savey	78587-05-0		
							Selenious Acid	7783-00-8		
		2.0E-02	C				Selenium	7782-49-2		8.8E+01
		2.0E-02	C				Selenium Sulfide	7446-34-6		8.8E+01
							Sethoxydim	74051-80-2		
		3.0E-03	C				Silica (crystalline, respirable)	7631-86-9		1.3E+01
							Silver	7440-22-4		
							Simazine	122-34-9		
							Sodium Acifluorfen	62476-59-9		
							Sodium Azide	26628-22-8		
							Sodium Diethyldithiocarbamate	148-18-5		
		1.3E-02	C				Sodium Fluoride	7681-49-4		5.7E+01
							Sodium Fluoroacetate	62-74-8		
							Sodium Metavanadate	13718-26-8		
							Stirofos (Tetrachlorovinphos)	961-11-5		

TR=1E-06
HQ=1.0

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Toxicity and Chemical-specific							Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen		Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
							Strontium, Stable	7440-24-6		
							Strychnine	57-24-9		
		1.0E+00	I	V			Styrene	100-42-5		4.4E+03
		2.0E-03	P				Sulfolane	126-33-0		8.8E+00
							Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9		
		1.0E-03	C				Sulfuric Acid	7664-93-9		4.4E+00
							Systhane	88671-89-0		
							TCMTB	21564-17-0		
							Tebuthiuron	34014-18-1		
							Temephos	3383-96-8		
							Terbacil	5902-51-2		
							Terbufos	13071-79-9		
							Terbutryn	886-50-0		
							Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1		
							Tetrachlorobenzene, 1,2,4,5-	95-94-3		
7.4E-06	I			V			Tetrachloroethane, 1,1,1,2-	630-20-6	1.7E+00	
5.8E-05	C			V			Tetrachloroethane, 1,1,2,2-	79-34-5	2.1E-01	
2.6E-07	I	4.0E-02	I	V			Tetrachloroethylene	127-18-4	4.7E+01	1.8E+02
							Tetrachlorophenol, 2,3,4,6-	58-90-2		
							Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1		
							Tetraethyl Dithiopyrophosphate	3689-24-5		
		8.0E+01	I	V			Tetrafluoroethane, 1,1,1,2-	811-97-2		3.5E+05
							Tetryl (Trinitrophenylmethylnitramine)	479-45-8		
							Thallium (I) Nitrate	10102-45-1		
							Thallium (Soluble Salts)	7440-28-0		
							Thallium Acetate	563-68-8		
							Thallium Carbonate	6533-73-9		
							Thallium Chloride	7791-12-0		
							Thallium Sulfate	7446-18-6		
							Thiobencarb	28249-77-6		
							Thiodiglycol	111-48-8		
							Thiofanox	39196-18-4		
							Thiophanate, Methyl	23564-05-8		
							Thiram	137-26-8		
							Tin	7440-31-5		
		1.0E-04	A				Titanium Tetrachloride	7550-45-0		4.4E-01
		5.0E+00	I	V			Toluene	108-88-3		2.2E+04
							Toluene-2,5-diamine	95-70-5		
							Toluidine, p-	106-49-0		
							Total Petroleum Hydrocarbons (Aliphatic High)	NA		
1.9E-07	P	6.0E-01	P	V			Total Petroleum Hydrocarbons (Aliphatic Low)	NA	6.5E+01	2.6E+03
4.5E-06	P	1.0E-01	P	V			Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	2.7E+00	4.4E+02
							Total Petroleum Hydrocarbons (Aromatic High)	NA		
7.8E-06	P	3.0E-02	P	V			Total Petroleum Hydrocarbons (Aromatic Low)	NA	1.6E+00	1.3E+02
		3.0E-03	P	V			Total Petroleum Hydrocarbons (Aromatic Medium)	NA		1.3E+01
3.2E-04	I						Toxaphene	8001-35-2	3.8E-02	
							Tralomethrin	66841-25-6		
							Tri-n-butyltin	688-73-3		
							Triacetin	102-76-1		
							Triallate	2303-17-5		
							Triasulfuron	82097-50-5		
							Tribromobenzene, 1,2,4-	615-54-3		
							Tributyl Phosphate	126-73-8		
							Tributyltin Compounds	NA		
							Tributyltin Oxide	56-35-9		
		3.0E+01	H	V			Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1		1.3E+05
							Trichloroacetic Acid	76-03-9		
							Trichloroaniline HCl, 2,4,6-	33663-50-2		
							Trichloroaniline, 2,4,6-	634-93-5		
				V			Trichlorobenzene, 1,2,3-	87-61-6		
		2.0E-03	P	V			Trichlorobenzene, 1,2,4-	120-82-1		8.8E+00
		5.0E+00	I	V			Trichloroethane, 1,1,1-	71-55-6		2.2E+04
1.6E-05	I	2.0E-04	X	V			Trichloroethane, 1,1,2-	79-00-5	7.7E-01	8.8E-01
4.1E-06	I	2.0E-03	I	V	M		Trichloroethylene	79-01-6	3.0E+00	8.8E+00
		7.0E-01	H	V			Trichlorofluoromethane	75-69-4		3.1E+03
							Trichlorophenol, 2,4,5-	95-95-4		
3.1E-06	I						Trichlorophenol, 2,4,6-	88-06-2	4.0E+00	
							Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5		
							Trichlorophenoxypropionic acid, -2,4,5	93-72-1		
				V			Trichloropropane, 1,1,2-	598-77-6		
		3.0E-04	I	V	M		Trichloropropane, 1,2,3-	96-18-4		1.3E+00
		3.0E-04	P	V			Trichloropropene, 1,2,3-	96-19-5		1.3E+00
							Tricresyl Phosphate (TCP)	1330-78-5		
							Tridiphane	58138-08-2		
		7.0E-03	I	V			Triethylamine	121-44-8		3.1E+01

TR=1E-06
HQ=1.0

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; 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

Toxicity and Chemical-specific						Contaminant		Carcinogenic Target Risk (TR) = 1E-06	Noncancer Hazard Index (HI) = 1
IUR $(ug/m^3)^{-1}$	key	RfC_i (mg/m^3)	key	voc	muta-gen	Analyte	CAS No.	Carcinogenic SL TR=1.0E-6 (ug/m^3)	Noncarcinogenic SL HI=1 (ug/m^3)
						Trifluralin	1582-09-8		
						Trimethyl Phosphate	512-56-1		
		5.0E-03	P	V		Trimethylbenzene, 1,2,3-	526-73-8		2.2E+01
		7.0E-03	P	V		Trimethylbenzene, 1,2,4-	95-63-6		3.1E+01
				V		Trimethylbenzene, 1,3,5-	108-67-8		
						Trinitrobenzene, 1,3,5-	99-35-4		
						Trinitrotoluene, 2,4,6-	118-96-7		
						Triphenylphosphine Oxide	791-28-6		
						Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8		
						Tris(1-chloro-2-propyl)phosphate	13674-84-5		
						Tris(2-chloroethyl)phosphate	115-96-8		
						Tris(2-ethylhexyl)phosphate	78-42-2		
		4.0E-05	A			Uranium (Soluble Salts)	NA		1.8E-01
2.9E-04	C				M	Urethane	51-79-6	4.2E-02	
8.3E-03	P	7.0E-06	P			Vanadium Pentoxide	1314-62-1	1.5E-03	3.1E-02
		1.0E-04	A			Vanadium and Compounds	7440-62-2		4.4E-01
						Vernolate	1929-77-7		
						Vinclozolin	50471-44-8		
		2.0E-01	I	V		Vinyl Acetate	108-05-4		8.8E+02
3.2E-05	H	3.0E-03	I	V		Vinyl Bromide	593-60-2	3.8E-01	1.3E+01
4.4E-06	I	1.0E-01	I	V	M	Vinyl Chloride	75-01-4	2.8E+00	4.4E+02
						Warfarin	81-81-2		
		1.0E-01	S	V		Xylene, P-	106-42-3		4.4E+02
		1.0E-01	S	V		Xylene, m-	108-38-3		4.4E+02
		1.0E-01	S	V		Xylene, o-	95-47-6		4.4E+02
		1.0E-01	I	V		Xylenes	1330-20-7		4.4E+02
						Zinc Phosphide	1314-84-7		
						Zinc and Compounds	7440-66-6		
						Zineb	12122-67-7		
						Zirconium	7440-67-7		

TR=1E-06
HQ=1.0