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App. F: List of Detected Chemicals

CAS Number	Chemical Name
100-41-4	Ethyl Benzene
100-42-5	Styrene
100-51-6	Benzyl alcohol
100-52-7	Benzaldehyde
10062-01-5	Dichloropropene, cis-1,3-
103-65-1	Propylbenzene
106-42-3	Xylene, p-
106-44-5	Methylphenol, 4-
106-47-8	Chloroaniline, 4-
106-98-9	Butene, 1-
107-13-1	Acrylonitrile
107-83-5	Methylpentane, 2-
108-08-7	Dimethylpentane, 2,4-
108-10-1	Methyl-2-pentanone, 4-
108-38-3	Xylene, m-
108-39-4	Methylphenol, 3-
108-67-8	Trimethylbenzene, 1,3,5-
108-87-2	Methylcyclohexane
108-88-3	Toluene
108-90-7	Chlorobenzene
108-95-2	Phenol
109-99-9	Tetrahydrofuran
110-54-3	Hexane
110-82-7	Cyclohexane
1120-21-4	Undecane
115-07-1	Propylene
117-81-7	bis(2-Ethylhexyl)phthalate
117-84-0	Di-n-octyl phthalate
118-74-1	Hexachlorobenzene
120-12-7	Anthracene
120-83-2	Dichlorophenol, 2,4-
121-14-2	Dinitrotoluene, 2,4-
123-38-6	Propanal
126-98-7	Methacrylonitrile
127-18-4	Tetrachloroethene
129-00-0	Pyrene
132-64-9	Dibenzofuran
156-59-2	Dichloroethene, cis-1,2-
1634-04-4	Methyl tert-butyl ether
1746-01-6	TCDD, 2,3,7,8-
18540-29-9	Chromium (VI)
1888-71-7	Hexachloropropene
191-24-2	Benzo(ghi)perylene
193-39-5	Indeno(1,2,3-cd)pyrene
19408-74-3	HxCDD, 1,2,3,7,8,9-
205-99-2	Benzo(b)fluoranthene

App. F: List of Detected Chemicals

CAS Number	Chemical Name
206-44-0	Fluoranthene
207-08-9	Benzo(k)fluoranthene
208-96-8	Acenaphthylene
218-01-9	Chrysene
3268-87-9	OCDD
35822-46-9	HpCDD, 1,2,3,4,6,7,8-
39001-02-0	OCDF
39227-28-6	HxCDD, 1,2,3,4,7,8-
40321-76-4	PeCDD, 1,2,3,7,8-
4170-30-3	Crotonaldehyde
50-00-0	Formaldehyde
51207-31-9	TCDF, 2,3,7,8-
529-20-4	Tolualdehyde, o-
540-84-1	Methylheptane, 2-
55673-89-7	HpCDF, 1,2,3,4,7,8,9-
56-23-5	Carbon Tetrachloride
56-55-3	Benzo(a)anthracene
565-59-3	Dimethylpentane, 2,3-
565-75-3	Trimethylpentane, 2,3,4
57117-31-4	PeCDF, 2,3,4,7,8-
57117-41-6	PeCDF, 1,2,3,7,8-
57117-44-9	HxCDF, 1,2,3,6,7,8-
57653-85-7	HxCDD, 1,2,3,6,7,8-
589-34-4	Methylhexane, 3-
589-81-1	Methylheptane, 3-
590-18-1	Butene, cis-2-
591-76-4	Methylhexane, 2-
591-78-6	Hexanone, 2-
606-20-2	Dinitrotoluene, 2,6-
60851-34-5	HxCDF, 2,3,4,6,7,8-
608-93-5	Pentachlorobenzene
620-14-4	Ethyltoluene, 3-
622-96-8	Ethyltoluene, 4-
624-64-6	butene, trans-2-
65-85-0	Benzoic acid
67562-39-4	HpCDF, 1,2,3,4,6,7,8-
67-64-1	Acetone
67-66-3	Chloroform
70648-26-9	HxCDF, 1,2,3,4,7,8-
71-43-2	Benzene
71-55-6	Trichloroethane, 1,1,1-
72918-21-9	HxCDF, 1,2,3,7,8,9-
7429-90-5	Aluminum
7439-92-1	Lead
7439-96-5	Manganese
7439-97-6	Mercury

App. F: List of Detected Chemicals

CAS Number	Chemical Name
7440-02-0	Nickel
7440-22-4	Silver
7440-36-0	Antimony
7440-38-2	Arsenic
7440-39-3	Barium
7440-43-9	Cadmium
7440-47-3	Chromium (III)
7440-48-4	Cobalt
7440-50-8	Copper
7440-66-6	Zinc
74-83-9	Bromomethane
74-87-3	Chloromethane
75-00-3	Chloroethane
75-01-4	Vinyl Chloride
75-05-8	Acetonitrile
75-07-0	Acetaldehyde
75-09-2	Methylene Chloride
75-15-0	Carbon Disulfide
75-83-2	Dimethylbutane, 2,2-
7647-01-0	HCl
7723-14-0	Phosphorus
7782-50-5	Cl2
78-93-3	Butanone (MEK), 2-
79-01-6	Trichloroethene
79-29-8	Dimethylbutane, 2,3-
84-66-2	Diethyl phthalate
85-01-8	Phenanthrene
85-68-7	Butyl benzyl phthalate
86-30-6	N-Nitrosodiphenyl amine
86-73-7	Fluorene
87-65-0	Dichlorophenol, 2,6-
88-06-2	Trichlorophenol, 2,4,6-
88-75-5	Nitrophenol, 2-
90-13-1	Chloronaphthalene, 1-
91-20-3	Naphthalene
91-57-6	Methylnaphthalene, 2-
95-47-6	Xylene, o-
95-57-8	Chlorophenol, 2-
95-63-6	Trimethylbenzene, 1,2,4-
96-14-0	Methylpentane, 3-
98-86-2	Acetophenone

Memorandum

Aerospace
Magna, Utah 84044-0098

Date	4 December 2003	From	Chris Burrows
Subject	Welding Fumes Air Sampling Results	Organization	Industrial Hygiene
		M/S	X4G3
To	Jeff Perry	Telephone	24702

SUMMARY

On 6 October 2003, Industrial Hygiene conducted air sampling during welding on small stainless steel cylinders at Building 8143 (Welding Shop). The specific type of welding performed was Gas Metal Arc Welding (GMAW). This sampling was conducted in order to evaluate worker exposure to metal fumes, ozone and carbon monoxide generated during this process.

Three air samples were collected over a 56-minute period. All sample results were below Occupational Safety & Health Administration (OSHA) exposure limits. Monitoring was also performed for ozone and carbon monoxide. Both sample results were within acceptable limits. Established safety precautions and PPE are appropriate and must continue to be used.

DISCUSSION

The monitored welding activity involved a two-step process. The first step involved welding a base to the bottom of the 4.5” diameter x 16” long cylinder. The second step involved skip welding a top piece to the cylinder. There were a total of 24 cylinders that were welded in this manner. Five cylinders had already been welded before exposure monitoring was initiated. During the sampling period, the swamp cooler was running and two of the windows were open. The doors were closed and the local exhaust ventilation was not in use.

The individual performing the welding wore an air-sampling pump. The sampling cassette was placed inside the welder’s helmet to determine exposure levels present within the welder’s breathing zone. Two additional area pumps were positioned within three feet from where the welding took place.

EXPOSURE LIMITS

OSHA has established permissible exposure limits (PELs) for many of the metals that were sampled. In the absence of an established OSHA PEL, an American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) was referenced. Also, if ACGIH had a lower recommended exposure limit than OSHA, the TLV was listed. Applicable PELs and TLVs are listed in the table below, along with the results of the air sampling.

SAMPLING METHODS & RESULTS

All samples were obtained and analyzed using NIOSH analytical method #7300. The analytes, and their respective 8-hour time weighted average (TWA), which is the average concentration over an 8-hour day, are listed below. Applicable PELs and TLVs are listed in the right column.

Analyte	**Welder 8-hour TWA (mg/m^3)**	**Area Sample (3ft Left of Weld Site) 8-hour TWA (mg/m^3)**	**Area Sample (2ft Behind Weld Site) 8-hour TWA (mg/m^3)**	**PELs/TLVs Exposure Limits (mg/m^3) 8-hour TWA (mg/m^3)**
Aluminum	ND**	ND**	ND**	5.0*
Arsenic	ND**	ND**	ND**	0.01*
Beryllium	ND**	ND**	ND**	0.002
Calcium	ND**	0.0048	0.0045	***
Cadmium	ND**	ND**	ND**	0.01*
Cobalt	ND**	ND**	ND**	0.02*
Chromium	0.0006	0.0059	0.0033	0.5
Copper	ND**	ND**	ND**	0.1
Iron	ND**	0.0164	ND**	5.0*
Lead	ND**	ND**	ND**	0.05
Lithium	ND**	ND**	ND**	***
Magnesium	ND**	ND**	ND**	10.0*
Manganese	0.0001	0.0099	0.0055	0.2*
Molybdenum	ND**	ND**	ND**	10.0*
Nickel	ND**	0.0016	0.0009	1.0
Phosphorus	ND**	ND**	ND**	***
Platinum	ND**	ND**	ND**	1.0*
Selenium	ND**	ND**	ND**	0.2
Silver	ND**	ND**	ND**	0.01
Sodium	ND**	ND**	ND**	***
Tellurium	ND**	ND**	ND**	0.1
Thallium	ND**	ND**	ND**	0.1
Titanium	ND**	ND**	ND**	***
Vanadium	ND**	ND**	ND**	0.1(C)
Yttrium	ND**	ND**	ND**	1.0
Zinc	ND**	ND**	ND**	5.0
Zirconium	ND**	ND**	ND**	5.0

* ACGIH TLV
** None Detected
*** Permissible Exposure Level Not Established
(C) Ceiling Limit – The concentration that should not be exceeded during any part of the working exposure.

Ozone and carbon monoxide samples were also taken during the welding process. These samples were collected using Drager colorimetric tubes. The results are as follows:

Material	Results in ppm (8 hr. TWA)	PEL/TLV (ppm – 8 hr. TWA)
Ozone	0.0117	0.08 (Moderate work level)
Carbon Monoxide	0.2333	25

CONCLUSIONS/RECOMMENDATIONS

Exposure levels during welding of stainless steel cylinders were below established exposure limits. However, these exposure limits are not a means of determining "safe" vs. "unsafe" work environments and therefore it is recommended that all control measures implemented to minimize exposure risk remain in place. Below is a list of control measures that need to continue:

- The established safety precautions (i.e., welding helmets, coveralls, leather gloves, appropriate eye protection, aprons, etc.) must remain in effect. Air conditioners should be running and the door and/or windows open whenever possible to help with dilution ventilation. Contact Industrial Hygiene if this is not possible.

- Ensure the selection of lens shade for welding helmets is appropriate for the activity being performed.

- Use local exhaust ventilation whenever possible.

Please post or distribute a copy of this memo so that all employees assigned to work in this area are aware of the findings and recommendations contained herein. If you have any questions or need additional information, please let me know.

P.J. Beyer
R.M. Crebs
G.E. Clift
E.B. Bruner
J.S. Davis
J.L. DeVries
R.L. Millet

"Welding Shop SS Cylinders Monitoring

EMPLOYEE EXPOSURE REPORT

Return signed copy of this page to Industrial Hygiene, M/S 654

LWR A23456 FY05-DRT-M062

DATE	FACILITY	OPERATION
August 18, 2004	M-137	Welding stainless steel

ANALYTE	8-HOUR EXPOSURE LIMIT (TLV)
Chromium	0.5 mg/m^3
Cobalt	0.02 mg/m^3
Copper	0.2 mg/m^3
Manganese	0.2 mg/m^3
Nickel	0.2 mg/m^3

Sample No.	Duration	Location	Chromium	Cobalt	Copper	Manganese	Nickel
04-DRT-127	45 min.	Clipped to lapel	Undetected	Undetected	0.0023 mg/m^3	0.0011 mg/m^3	Undetected
04-DRT-128	59 min.	Clipped to lapel	Undetected	Undetected	0.0009 mg/m^3	0.0009 mg/m^3	Undetected

EMPLOYEE SIGNATURE:
Employee Badge 12565

ACTION PLAN:

1. Have the employee who was monitored sign this Employee Exposure Report and return it to Industrial Hygiene at mailstop 654. (**Mandatory**)
2. Post a copy of the attached Occupational Exposure Sampling Results in the work area for a period of 30 days for affected employees to review. (**Mandatory**)

INDUSTRIAL HYGIENE SAMPLING WORK SHEET

FY05-DRT-M062

BUILDING M-137 COST CENTER 6250 SAMPLE DATE 08-18-04 LWR # A23463

HYGIENIST BADGE # 70277 NAME Sterling Pierce SIGNATURE David Scott

OPERATION welding

PROGRAM

SHIFT D ✓ S___ G___ 8hr___ 10hr___

SAMPLE #	04DRT-127	04DRT-128		
SAMPLE TYPE	Personal	Personal		
EMPLOYEE	Jeff Madsen	Jeff Madsen		
BADGE #	12565	12565		
S.S.N.				
JOB TITLE				
PPE				
SAMPLE LOCATION				
MEDIA TYPE	MCE	Matched weight		
EQUIPMENT ID	7866	7967		
TIME ON				
TIME OFF				
TOTAL TIME	45	59		
CALIBRATION PRE	1.95	1.95		
POST	1.95	1.95		
AVERAGE	1.95	1.95		
VOLUME	87.75 l	115.05 l		
CONCENTRATION/TWA	CONC / TWA	CONC / TWA	CONC / TWA	CONC / TWA
ANALYTE 1 Chromium	Undetected	Undetected	TWA (for 127 and 128) Undetected	
ANALYTE 2 Cobalt	Undetected	Undetected	Undetected	/
ANALYTE 3 Copper	0.0023 mg/m3	0.0004 mg/m3	0.0013 mg/m3	/
ANALYTE 4 Nickel	Undetected	Undetected	Undetected	/
ANALYTE 5 Manganese	0.0011 mg/m3	0.0004 mg/m3	0.00102 mg/m3	/

NOTES:

SKETCHES ON REVERSE Y___ N___

LWR A 23463 Metals

04-DRT-127

Chromium undetected

Cobalt undetected

Copper $\frac{0.0002\ mg}{0.08775\ m^3} = 0.0023\ mg/m^3$

Nickel undetected

Manganese $\frac{0.0001\ mg}{0.08775\ m^3} = 0.0011\ mg/m^3$

04-DRT-128

Chromium undetected

Cobalt undetected

Copper $\frac{0.0001\ mg}{0.11505\ m^3} = 0.0009\ mg/m^3$

Nickel undetected

Manganese $\frac{0.0001\ mg}{0.11505\ m^3} = 0.0009\ mg/m^3$

Copper $\frac{(0.0023 \times 45\ min) + (0.0009 \times 59\ min)}{480\ minutes} = \frac{0.1538}{480} = 0.0003\ mg/m^3$

Manganese $\frac{(0.0009 \times 45) + (0.0009 \times 59)}{480} = \frac{0.1026}{480} = 0.0002\ mg/m^3$

CERTIFICATE OF ANALYSIS
Listing of Sample Information and Testing Requested

Monday, September 13, 2004

TESTED FOR: ATK Thiokol: SPACE
Brigham City, UT 84302

ANALYZED BY: ATK Thiokol Propulsion
Environmental Laboratory
P.O. Box 707, M/S 245
Brigham City, UT
84302-0707
435-863-3732
435-863-8080

Contact Name: David R. Trott

Project: ATK Industrial Hygiene

Sample Delivery Group: 0408035

Sample Delivery Group: 0408035

Sample No.	Client No.	Sample Description	Received	Collect Date/Time
0408035-01	04DRT-127		08/18/04	8/18/2004 00:00:00
NIOSH 7300		Metals Analysis by ICP - 6010	Industrial Hygiene	
0408035-02	04DRT-128		08/18/04	8/18/2004 00:00:00
NIOSH 7300		Metals Analysis by ICP - 6010	Industrial Hygiene	
0408035-03	04DRT-140		08/18/04	8/18/2004 00:00:00
NIOSH 7300		Metals Analysis by ICP - 6010	Industrial Hygiene	
0408035-04	04DRT-141		08/18/04	8/18/2004 00:00:00
NIOSH 7300		Metals Analysis by ICP - 6010	Industrial Hygiene	

Certified By: Validity unknown W. Scott Fraser — 09/14/2004

W. Scott Fraser, Quality Assurance Officer — Date

This certifies that the following samples were analyzed using good laboratory practices to show the following results:

Listing of Results by Sample

Sample Delivery Group: 0408035

Client Sample ID: 04DRT-127 | **Laboratory Sample ID:** 0408035-01
Sample Description: ATK-IH - Metals Analysis | **Date Sampled:** 08/18/04 00:00

CAS Number	Test Parameter	Result	Units	LOD	LOQ	Dilution Factor	Analyst	Test Date
Test Method:	*NIOSH 7300* Metals Analysis by ICP - 6010							
7440-47-3	CHROMIUM	U	mg	0.005	0.015	1	JMA	09/13/04
7440-48-4	COBALT	U	mg	0.000075	0.000375	1	JMA	09/13/04
7440-50-8	COPPER	0.0002 J	mg	0.00005	0.00025	1	JMA	09/13/04
7439-96-5	MANGANESE	0.0001 J	mg	0.000025	0.000125	1	JMA	09/13/04
7440-02-0	NICKEL	U	mg	0.001	0.005	1	JMA	09/13/04

Client Sample ID: 04DRT-128 | **Laboratory Sample ID:** 0408035-02
Sample Description: ATK-IH - Metals Analysis | **Date Sampled:** 08/18/04 00:00

CAS Number	Test Parameter	Result	Units	LOD	LOQ	Dilution Factor	Analyst	Test Date
Test Method:	*NIOSH 7300* Metals Analysis by ICP - 6010							
7440-47-3	CHROMIUM	U	mg	0.005	0.015	1	JMA	09/13/04
7440-48-4	COBALT	U	mg	0.000075	0.000375	1	JMA	09/13/04
7440-50-8	COPPER	0.0001 J	mg	0.00005	0.00025	1	JMA	09/13/04
7439-96-5	MANGANESE	0.0001 J	mg	0.000025	0.000125	1	JMA	09/13/04
7440-02-0	NICKEL	U	mg	0.001	0.005	1	JMA	09/13/04

Client Sample ID: 04DRT-140 | **Laboratory Sample ID:** 0408035-03
Sample Description: ATK-IH - Metals Analysis | **Date Sampled:** 08/18/04 00:00

CAS Number	Test Parameter	Result	Units	LOD	LOQ	Dilution Factor	Analyst	Test Date
Test Method:	*NIOSH 7300* Metals Analysis by ICP - 6010							
7440-43-9	CADMIUM	U	mg	0.002	0.007	1	JMA	09/13/04

Client Sample ID: 04DRT-141 | **Laboratory Sample ID:** 0408035-04
Sample Description: ATK-IH - Metals Analysis | **Date Sampled:** 08/18/04 00:00

CAS Number	Test Parameter	Result	Units	LOD	LOQ	Dilution Factor	Analyst	Test Date
Test Method:	*NIOSH 7300* Metals Analysis by ICP - 6010							
7440-43-9	CADMIUM	U	mg	0.002	0.007	1	JMA	09/13/04

Data Reporting Qualifiers

U	Indicates compound was analyzed for and was not detected, or the compound was detected but was below the detection limit.
B	Gas Chromatography and Mass Spectral Data Flag. This flag is used when an analyte is found in the blank as well as the sample.
J	Gas Chromatography and Mass Spectral Data Flag. Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds or when the data indicated the presence of a compound that meets the identification criteria but the result is less than the specified reporting limit (e.g. 3 J with a reporting limit of 10).
Dil. Factor	Dilution Factor: The prepared sample was diluted by this factor because the sample was too concentrated or due to other interferences in the sample matrix. Any dilution factor causes an appropriate increase in the method detection limit and reporting limit.
LOD	Limit of Detection (three times the signal noise level)
LOQ	Limit of Quantitation - Quantitation Limit is defined as 10 times the signal noise level.

LABORATORY WORK REQUEST

0408035

№ A23463

TO: R+D Lab

FROM	EXTENSION	COST CENTER	PROJECT NO.	TASK	SUBTASK
Sterling Pierce	2015				

ORGANIZATION	MAIL STOP	WORK ORDER NO.	USER	PCN
Safety	654	B3845		

CPI NO.	REV NO.	OPERATION NO.	STEP NO.

SAMPLE INFORMATION

SAMPLE DESCRIPTION		DATE
Mce filter	☐ RAW MATERIAL ☐ INPROCESS ☐ POST PROCESS	18 Aug 04

PART NO. / STOCK NO.	SERIAL NO. / LOT NO.	ASSEMBLY PART NO.	ASSEMBLY SERIAL NO.

MIX	GRIND	SAMPLED BY

TEST REQUIRED OR DESCRIPTION OF WORK REQUIRED, INCLUDING REASON FOR REQUEST

1. 04DRT-127 analyze for Manganese Cobalt copper Nickel and chromium
2. 04DRT-128
3.
4. 04DRT-140 Please analyze for cadmium
5. 04DRT-141
6.
7.
8.

REPORT RESULTS TO	SEND COPY TO	RESULTS DESIRED BY (SPECIFIC DATE)
Dave Trott		I H Normal 2 Sept 04
		AUTHORIZED SIGNATURE OR INSPECTION STAMP

FOR LABORATORY USE ONLY

SPECIAL INSTRUCTIONS

RESULTS OF LABORATORY ANALYSIS

DISPOSITION

☐ ACCEPT ☐ REJECT ☐ RESAMPLE

DATE AND TIME COMPLETED	TIME REQUIRED		SIGNATURE

FORM FSE-0007

LABORATORY WORK REQUEST

NO A23463

TO					
R+D Lab					
FROM	EXTENSION	COST CENTER	PROJECT NO.	TASK	SUBTASK
Sterling Pierce	2015				
ORGANIZATION	MAIL STOP	WORK ORDER NO.		USER	PCN
Safety	654	B3845			
CPI NO.	REV NO.	OPERATION NO.	STEP NO.		

SAMPLE INFORMATION

SAMPLE DESCRIPTION			DATE
Mce filter		☐ RAW MATERIAL ☐ INPROCESS ☐ POST PROCESS	18 Aug 04
PART NO. / STOCK NO.	SERIAL NO. / LOT NO.	ASSEMBLY PART NO.	ASSEMBLY SERIAL NO.
MIX	GRIND	SAMPLED BY	

TEST REQUIRED OR DESCRIPTION OF WORK REQUIRED, INCLUDING REASON FOR REQUEST

1. 04DRT-127 analyze for Chromium
2. 04DRT-129
3.
4. 04DRT-140 Please analyze for cadmium
5. 04DRT-141
6.
7.
8.

REPORT RESULTS TO	SEND COPY TO	RESULTS DESIRED BY (SPECIFIC DATE)
Dave Trott		I H Normal 2 Sept 04
		AUTHORIZED SIGNATURE OR INSPECTION STAMP

HOLD FOR

SAMPLE RESULTS

FORM FSE-0007

Blair,

I have looked at the metals data from the open burn air sampling and found that the data set is fairly limited with only sample results provided (i.e. no run quality control data). There is a data verification report that identifies some quality control issues and how data has been flagged accordingly. In all, there does not appear to be any major problems with the data as far as could be determined with the information provided.

You asked me to look specifically at the Nickel results to see if there were any issues. Again, with the limited information, I had to rely on the data verification comments to assess any quality control issues. It is noted that low values for Nickel were flagged with a "U" and the reporting limit slightly elevated because Nickel was detected at a low level in Field Blanks. Otherwise, the data looks fine. I did notice a pattern that may be of interest. Where Nickel is reported, Chromium is also present. Conversely where Nickel is low or not detected, Chromium is low or not detected. This pattern might suggest that the ignition wire for the open burn events (which I didn't see in the report but you mentioned to me verbally as being a Income (a nickel-chromium alloy) wire) is the source of the Chromium and Nickel on the filters. Below is a table summarizing the values seen for Chromium and Nickel:

	100% Propellant				85% Propellant/15% Waste				65% Propellant/35% Waste			
	Run 1	Run 2	Run 3	Bog	Run 1	Run 2	Run 3	Bog	Run 1	Run 2	Run 3	Bog
Chromium	3.4	36.3	15.0	<1.1 U	10.8	9.3	35.1	<3.0 U	15.9	16.5	44.8	<3.0 U
Nickel	<6.3 U	103	67.9	<4.2 U	<10.6 U	<18.7 U	103	<5.7 U	<19.9 U	42.7	52.3	<6.2 U

While it is difficult to make any definitive statements about the NiChrome wire being the source of the Chromium and Nickel, it seems like a reasonable speculation as we don't expect the Propellant nor the Waste to contain any significant quantities of these metals.

If you have any questions, please feel free to contact me.

Thanks,

W. Scott Fraser

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One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_1**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_1**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_1**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_1**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_10**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_10**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_10**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_10**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_11**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_11**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_11**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_11**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_4**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_4**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_4**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_4**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_7**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_7**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_7**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_7**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_8**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_8**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_8**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A1_8**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A2**
lbs/event	**10,000**
lbs/hour	**10,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	5.48E-03	3,600	6.90E-04
208-96-8	Acenaphthylene	3.08E-06	3.08E-02	3,600	3.88E-03
75-07-0	Acetaldehyde	9.30E-05	9.30E-01	3,600	1.17E-01
67-64-1	Acetone	2.40E-05	2.40E-01	3,600	3.02E-02
75-05-8	Acetonitrile	1.90E-05	1.90E-01	3,600	2.39E-02
98-86-2	Acetophenone	2.68E-06	2.68E-02	3,600	3.38E-03
107-13-1	Acrylonitrile	1.60E-05	1.60E-01	3,600	2.02E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	5.70E-03	3,600	7.18E-04
7429-90-5	Aluminum	4.00E-02	4.00E+02	3,600	5.04E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.10E-01	3,600	1.39E-02
62-53-3	Aniline	8.00E-06	8.00E-02	3,600	1.01E-02
120-12-7	Anthracene	1.30E-07	1.30E-03	3,600	1.64E-04
7440-36-0	Antimony	2.90E-05	2.90E-01	3,600	3.65E-02
7440-38-2	Arsenic	5.50E-07	5.50E-03	3,600	6.93E-04
7440-39-3	Barium	3.90E-07	3.90E-03	3,600	4.91E-04
100-52-7	Benzaldehyde	3.80E-05	3.80E-01	3,600	4.79E-02
71-43-2	Benzene	1.20E-04	1.20E+00	3,600	1.51E-01
56-55-3	Benzo(a)anthracene	5.86E-07	5.86E-03	3,600	7.38E-04
50-32-8	Benzo(a)pyrene	7.69E-08	7.69E-04	3,600	9.69E-05
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.15E-02	3,600	1.45E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	4.55E-03	3,600	5.73E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.15E-02	3,600	1.45E-03
65-85-0	Benzoic acid	6.24E-05	6.24E-01	3,600	7.86E-02
100-51-6	Benzyl alcohol	7.77E-07	7.77E-03	3,600	9.79E-04
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	5.48E-03	3,600	6.90E-04
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	6.13E-03	3,600	7.72E-04
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.17E-02	3,600	1.47E-03
75-27-4	Bromodichloro methane	7.80E-07	7.80E-03	3,600	9.83E-04
75-25-2	Bromoform	1.30E-06	1.30E-02	3,600	1.64E-03
74-83-9	Bromomethane	1.20E-07	1.20E-03	3,600	1.51E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	5.48E-03	3,600	6.90E-04
78-93-3	Butanone (MEK), 2-	3.90E-06	3.90E-02	3,600	4.91E-03
106-98-9	Butene, 1-	2.20E-05	2.20E-01	3,600	2.77E-02
590-18-1	Butene, cis-2-	1.70E-06	1.70E-02	3,600	2.14E-03
624-64-6	butene, trans-2-	7.70E-06	7.70E-02	3,600	9.70E-03
85-68-7	Butyl benzyl phthalate	1.50E-07	1.50E-03	3,600	1.89E-04
7440-43-9	Cadmium	4.70E-08	4.70E-04	3,600	5.92E-05
86-74-8	Carbazole	7.01E-07	7.01E-03	3,600	8.83E-04
75-15-0	Carbon Disulfide	9.80E-06	9.80E-02	3,600	1.23E-02
56-23-5	Carbon Tetrachloride	1.50E-05	1.50E-01	3,600	1.89E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	6.79E-03	3,600	8.56E-04
107-14-2	Chloroacetonitrile	1.10E-06	1.10E-02	3,600	1.39E-03
106-47-8	Chloroaniline, 4-	1.55E-07	1.55E-03	3,600	1.95E-04
108-90-7	Chlorobenzene	2.50E-06	2.50E-02	3,600	3.15E-03
75-00-3	Chloroethane	4.40E-07	4.40E-03	3,600	5.54E-04
67-66-3	Chloroform	6.10E-06	6.10E-02	3,600	7.69E-03
74-87-3	Chloromethane	1.40E-05	1.40E-01	3,600	1.76E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	5.48E-03	3,600	6.90E-04
91-58-7	Chloronaphthalene, 2-	5.48E-07	5.48E-03	3,600	6.90E-04
95-57-8	Chlorophenol, 2-	1.92E-06	1.92E-02	3,600	2.42E-03
7440-47-3	Chromium (III)	1.10E-05	1.10E-01	3,600	1.39E-02
18540-29-9	Chromium (VI)	9.00E-06	9.00E-02	3,600	1.13E-02
218-01-9	Chrysene	7.23E-07	7.23E-03	3,600	9.11E-04
7782-50-5	Cl2	1.18E-02	1.18E+02	3,600	1.49E+01
7440-48-4	Cobalt	1.20E-07	1.20E-03	3,600	1.51E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A2**
lbs/event	**10,000**
lbs/hour	**10,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	2.50E-01	3,600	3.15E-02
4170-30-3	Crotonaldehyde	3.20E-06	3.20E-02	3,600	4.03E-03
98-82-8	Cumene	4.20E-07	4.20E-03	3,600	5.29E-04
110-82-7	Cyclohexane	2.50E-06	2.50E-02	3,600	3.15E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.02E-03	3,600	1.29E-04
132-64-9	Dibenzofuran	5.48E-07	5.48E-03	3,600	6.90E-04
124-48-1	Dibromochloromethane	8.80E-07	8.80E-03	3,600	1.11E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	8.90E-03	3,600	1.12E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	5.59E-03	3,600	7.04E-04
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	6.24E-03	3,600	7.86E-04
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	5.81E-03	3,600	7.32E-04
75-34-3	Dichloroethane, 1,1-	3.20E-07	3.20E-03	3,600	4.03E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	5.40E-03	3,600	6.80E-04
75-35-4	Dichloroethene, 1,1-	4.30E-07	4.30E-03	3,600	5.42E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.20E-03	3,600	1.51E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	7.20E-03	3,600	9.07E-04
120-83-2	Dichlorophenol, 2,4-	9.26E-07	9.26E-03	3,600	1.17E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	5.48E-03	3,600	6.90E-04
78-87-5	Dichloropropane, 1,2-	3.70E-07	3.70E-03	3,600	4.66E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	1.30E-02	3,600	1.64E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	6.10E-03	3,600	7.69E-04
84-66-2	Diethyl phthalate	8.00E-07	8.00E-03	3,600	1.01E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	6.70E-03	3,600	8.44E-04
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	6.90E-02	3,600	8.69E-03
131-11-3	Dimethyl phthalate	5.48E-07	5.48E-03	3,600	6.90E-04
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	5.48E-03	3,600	6.90E-04
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	2.70E-01	3,600	3.40E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	1.40E-02	3,600	1.76E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	3.50E-02	3,600	4.41E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	1.40E-01	3,600	1.76E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	5.20E-02	3,600	6.55E-03
84-74-2	Di-n-butyl phthalate	1.10E-05	1.10E-01	3,600	1.39E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	9.53E-02	3,600	1.20E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	5.70E-03	3,600	7.18E-04
51-28-5	Dinitrophenol, 2,4-	2.41E-05	2.41E-01	3,600	3.04E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	5.48E-03	3,600	6.90E-04
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	5.63E-03	3,600	7.09E-04
117-84-0	Di-n-octyl phthalate	3.70E-06	3.70E-02	3,600	4.66E-03
123-91-1	Dioxane, 1,4-	6.40E-07	6.40E-03	3,600	8.06E-04
122-39-4	Diphenylamine	5.48E-07	5.48E-03	3,600	6.90E-04
100-41-4	Ethyl Benzene	1.10E-05	1.10E-01	3,600	1.39E-02
60-29-7	Ethyl Ether	2.50E-06	2.50E-02	3,600	3.15E-03
97-63-2	Ethyl Methacrylate	1.60E-06	1.60E-02	3,600	2.02E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	4.50E-03	3,600	5.67E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	4.80E-02	3,600	6.05E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	5.30E-02	3,600	6.68E-03
206-44-0	Fluoranthene	2.63E-06	2.63E-02	3,600	3.31E-03
86-73-7	Fluorene	6.53E-07	6.53E-03	3,600	8.23E-04
50-00-0	Formaldehyde	4.70E-05	4.70E-01	3,600	5.92E-02
7647-01-0	HCl	1.78E-02	1.78E+02	3,600	2.24E+01
118-74-1	Hexachlorobenzene	4.66E-06	4.66E-02	3,600	5.87E-03
87-68-3	Hexachlorobutadiene	8.11E-07	8.11E-03	3,600	1.02E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.10E-01	3,600	1.39E-02
67-72-1	Hexachloroethane	5.91E-07	5.91E-03	3,600	7.45E-04
1888-71-7	Hexachloropropene	7.89E-07	7.89E-03	3,600	9.94E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A2**
lbs/event	**10,000**
lbs/hour	**10,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	9.80E-02	3,600	1.23E-02
591-78-6	Hexanone, 2-	2.00E-06	2.00E-02	3,600	2.52E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	2.90E-07	3,600	3.65E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	7.30E-06	3,600	9.20E-07
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	1.90E-06	3,600	2.39E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	3.50E-08	3,600	4.41E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	8.90E-08	3,600	1.12E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	6.10E-08	3,600	7.69E-09
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	2.60E-06	3,600	3.28E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	1.60E-06	3,600	2.02E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.20E-06	3,600	1.51E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	1.90E-06	3,600	2.39E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	3.98E-03	3,600	5.01E-04
78-59-1	Isophorone	5.48E-07	5.48E-03	3,600	6.90E-04
7439-92-1	Lead	4.10E-05	4.10E-01	3,600	5.17E-02
7439-96-5	Manganese	9.40E-05	9.40E-01	3,600	1.18E-01
7439-97-6	Mercury	7.40E-08	7.40E-04	3,600	9.32E-05
126-98-7	Methacrylonitrile	5.90E-06	5.90E-02	3,600	7.43E-03
80-62-6	Methyl Methacrylate	1.60E-06	1.60E-02	3,600	2.02E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	1.30E-01	3,600	1.64E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	8.20E-03	3,600	1.03E-03
108-87-2	Methylcyclohexane	1.20E-05	1.20E-01	3,600	1.51E-02
75-09-2	Methylene Chloride	2.40E-04	2.40E+00	3,600	3.02E-01
540-84-1	Methylheptane, 2-	2.40E-05	2.40E-01	3,600	3.02E-02
589-81-1	Methylheptane, 3-	3.50E-06	3.50E-02	3,600	4.41E-03
591-76-4	Methylhexane, 2-	1.70E-05	1.70E-01	3,600	2.14E-02
589-34-4	Methylhexane, 3-	2.20E-05	2.20E-01	3,600	2.77E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	7.47E-02	3,600	9.41E-03
107-83-5	Methylpentane, 2-	1.10E-05	1.10E-01	3,600	1.39E-02
96-14-0	Methylpentane, 3-	7.10E-06	7.10E-02	3,600	8.95E-03
95-48-7	Methylphenol, 2-	3.29E-06	3.29E-02	3,600	4.15E-03
91-20-3	Naphthalene	9.16E-05	9.16E-01	3,600	1.15E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.10E-01	3,600	1.39E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.10E-01	3,600	1.39E-02
7440-02-0	Nickel	5.80E-05	5.80E-01	3,600	7.31E-02
88-74-4	Nitroaniline, 2-	5.48E-07	5.48E-03	3,600	6.90E-04
99-09-2	Nitroaniline, 3-	2.19E-06	2.19E-02	3,600	2.76E-03
100-01-6	Nitroaniline, 4-	2.19E-06	2.19E-02	3,600	2.76E-03
98-95-3	Nitrobenzene	6.24E-07	6.24E-03	3,600	7.86E-04
88-75-5	Nitrophenol, 2-	4.71E-06	4.71E-02	3,600	5.93E-03
100-02-7	Nitrophenol, 4-	3.61E-06	3.61E-02	3,600	4.55E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	5.48E-03	3,600	6.90E-04
62-75-9	N-Nitrosodimethylamine	5.58E-07	5.58E-03	3,600	7.03E-04
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	5.48E-03	3,600	6.90E-04
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	5.48E-03	3,600	6.90E-04
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	9.75E-04	3,600	1.23E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	9.09E-03	3,600	1.15E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	5.48E-03	3,600	6.90E-04
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	6.70E-08	3,600	8.44E-09
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	8.00E-07	3,600	1.01E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	1.60E-06	3,600	2.02E-07
608-93-5	Pentachlorobenzene	5.48E-07	5.48E-03	3,600	6.90E-04
76-01-7	Pentachloroethane	6.98E-07	6.98E-03	3,600	8.79E-04
82-68-8	Pentachloronitrobenzene	5.81E-07	5.81E-03	3,600	7.32E-04
87-86-5	Pentachlorophenol	2.74E-05	2.74E-01	3,600	3.45E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A2**
lbs/event	**10,000**
lbs/hour	**10,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	4.90E-03	3,600	6.17E-04
85-01-8	Phenanthrene	3.17E-06	3.17E-02	3,600	3.99E-03
108-95-2	Phenol	2.98E-06	2.98E-02	3,600	3.75E-03
7723-14-0	Phosphorus	1.10E-04	1.10E+00	3,600	1.39E-01
123-38-6	Propanal	5.20E-05	5.20E-01	3,600	6.55E-02
103-65-1	Propylbenzene	4.60E-06	4.60E-02	3,600	5.80E-03
115-07-1	Propylene	4.90E-05	4.90E-01	3,600	6.17E-02
129-00-0	Pyrene	2.25E-06	2.25E-02	3,600	2.84E-03
110-86-1	Pyridine	8.11E-07	8.11E-03	3,600	1.02E-03
7782-49-2	Selenium	1.60E-06	1.60E-02	3,600	2.02E-03
7440-22-4	Silver	1.20E-06	1.20E-02	3,600	1.51E-03
100-42-5	Styrene	1.30E-06	1.30E-02	3,600	1.64E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	2.30E-08	3,600	2.90E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	4.00E-07	3,600	5.04E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	5.48E-03	3,600	6.90E-04
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	4.20E-03	3,600	5.29E-04
127-18-4	Tetrachloroethene	2.50E-06	2.50E-02	3,600	3.15E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	7.12E-03	3,600	8.97E-04
109-99-9	Tetrahydrofuran	9.00E-07	9.00E-03	3,600	1.13E-03
108-88-3	Toluene	2.80E-05	2.80E-01	3,600	3.53E-02
95-53-4	Toluidine, o-	7.01E-06	7.01E-02	3,600	8.83E-03
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	6.46E-03	3,600	8.14E-04
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	2.70E-03	3,600	3.40E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	7.30E-03	3,600	9.20E-04
79-01-6	Trichloroethene	9.40E-07	9.40E-03	3,600	1.18E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	1.42E-02	3,600	1.79E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	1.31E-02	3,600	1.65E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	4.20E-03	3,600	5.29E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	2.50E-01	3,600	3.15E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	1.90E-01	3,600	2.39E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	8.20E-02	3,600	1.03E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	5.48E-03	3,600	6.90E-04
1120-21-4	Undecane	1.20E-05	1.20E-01	3,600	1.51E-02
75-01-4	Vinyl Chloride	7.60E-06	7.60E-02	3,600	9.58E-03
95-47-6	Xylene, o-	1.30E-05	1.30E-01	3,600	1.64E-02
7440-66-6	Zinc	5.60E-05	5.60E-01	3,600	7.06E-02
3268-87-9	OCDD	3.70E-11	3.70E-07	3,600	4.66E-08
39001-02-0	OCDF	5.30E-10	5.30E-06	3,600	6.68E-07
108-38-3	Xylene, m-	1.10E-05	1.10E-01	3,600	1.39E-02
106-42-3	Xylene, p-	1.10E-05	1.10E-01	3,600	1.39E-02
108-39-4	Methylphenol, 3-	1.29E-07	1.29E-03	3,600	1.62E-04
106-44-5	Methylphenol, 4-	1.29E-07	1.29E-03	3,600	1.62E-04
529-20-4	Tolualdehyde, o-	4.00E-05	4.00E-01	3,600	5.04E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A3**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	8.77E-03	3,600	1.10E-03
208-96-8	Acenaphthylene	3.08E-06	4.93E-02	3,600	6.21E-03
75-07-0	Acetaldehyde	9.30E-05	1.49E+00	3,600	1.87E-01
67-64-1	Acetone	2.40E-05	3.84E-01	3,600	4.84E-02
75-05-8	Acetonitrile	1.90E-05	3.04E-01	3,600	3.83E-02
98-86-2	Acetophenone	2.68E-06	4.29E-02	3,600	5.40E-03
107-13-1	Acrylonitrile	1.60E-05	2.56E-01	3,600	3.23E-02
100-44-7	alpha-Chlorotoluene	5.70E-07	9.12E-03	3,600	1.15E-03
7429-90-5	Aluminum	4.00E-02	6.40E+02	3,600	8.06E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.76E-01	3,600	2.22E-02
62-53-3	Aniline	8.00E-06	1.28E-01	3,600	1.61E-02
120-12-7	Anthracene	1.30E-07	2.08E-03	3,600	2.62E-04
7440-36-0	Antimony	2.90E-05	4.64E-01	3,600	5.85E-02
7440-38-2	Arsenic	5.50E-07	8.80E-03	3,600	1.11E-03
7440-39-3	Barium	3.90E-07	6.24E-03	3,600	7.86E-04
100-52-7	Benzaldehyde	3.80E-05	6.08E-01	3,600	7.66E-02
71-43-2	Benzene	1.20E-04	1.92E+00	3,600	2.42E-01
56-55-3	Benzo(a)anthracene	5.86E-07	9.38E-03	3,600	1.18E-03
50-32-8	Benzo(a)pyrene	7.69E-08	1.23E-03	3,600	1.55E-04
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
191-24-2	Benzo(ghi)perylene	4.55E-07	7.28E-03	3,600	9.17E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.84E-02	3,600	2.32E-03
65-85-0	Benzoic acid	6.24E-05	9.98E-01	3,600	1.26E-01
100-51-6	Benzyl alcohol	7.77E-07	1.24E-02	3,600	1.57E-03
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	8.77E-03	3,600	1.10E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	9.81E-03	3,600	1.24E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.87E-02	3,600	2.36E-03
75-27-4	Bromodichloro methane	7.80E-07	1.25E-02	3,600	1.57E-03
75-25-2	Bromoform	1.30E-06	2.08E-02	3,600	2.62E-03
74-83-9	Bromomethane	1.20E-07	1.92E-03	3,600	2.42E-04
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	8.77E-03	3,600	1.10E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	6.24E-02	3,600	7.86E-03
106-98-9	Butene, 1-	2.20E-05	3.52E-01	3,600	4.44E-02
590-18-1	Butene, cis-2-	1.70E-06	2.72E-02	3,600	3.43E-03
624-64-6	butene, trans-2-	7.70E-06	1.23E-01	3,600	1.55E-02
85-68-7	Butyl benzyl phthalate	1.50E-07	2.40E-03	3,600	3.02E-04
7440-43-9	Cadmium	4.70E-08	7.52E-04	3,600	9.48E-05
86-74-8	Carbazole	7.01E-07	1.12E-02	3,600	1.41E-03
75-15-0	Carbon Disulfide	9.80E-06	1.57E-01	3,600	1.98E-02
56-23-5	Carbon Tetrachloride	1.50E-05	2.40E-01	3,600	3.02E-02
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	1.09E-02	3,600	1.37E-03
107-14-2	Chloroacetonitrile	1.10E-06	1.76E-02	3,600	2.22E-03
106-47-8	Chloroaniline, 4-	1.55E-07	2.48E-03	3,600	3.12E-04
108-90-7	Chlorobenzene	2.50E-06	4.00E-02	3,600	5.04E-03
75-00-3	Chloroethane	4.40E-07	7.04E-03	3,600	8.87E-04
67-66-3	Chloroform	6.10E-06	9.76E-02	3,600	1.23E-02
74-87-3	Chloromethane	1.40E-05	2.24E-01	3,600	2.82E-02
90-13-1	Chloronaphthalene, 1-	5.48E-07	8.77E-03	3,600	1.10E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
95-57-8	Chlorophenol, 2-	1.92E-06	3.07E-02	3,600	3.87E-03
7440-47-3	Chromium (III)	1.10E-05	1.76E-01	3,600	2.22E-02
18540-29-9	Chromium (VI)	9.00E-06	1.44E-01	3,600	1.81E-02
218-01-9	Chrysene	7.23E-07	1.16E-02	3,600	1.46E-03
7782-50-5	Cl2	1.18E-02	1.89E+02	3,600	2.38E+01
7440-48-4	Cobalt	1.20E-07	1.92E-03	3,600	2.42E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A3**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	4.00E-01	3,600	5.04E-02
4170-30-3	Crotonaldehyde	3.20E-06	5.12E-02	3,600	6.45E-03
98-82-8	Cumene	4.20E-07	6.72E-03	3,600	8.47E-04
110-82-7	Cyclohexane	2.50E-06	4.00E-02	3,600	5.04E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.63E-03	3,600	2.06E-04
132-64-9	Dibenzofuran	5.48E-07	8.77E-03	3,600	1.10E-03
124-48-1	Dibromochloromethane	8.80E-07	1.41E-02	3,600	1.77E-03
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.42E-02	3,600	1.79E-03
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	8.94E-03	3,600	1.13E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	9.98E-03	3,600	1.26E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	9.30E-03	3,600	1.17E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	5.12E-03	3,600	6.45E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	8.64E-03	3,600	1.09E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	6.88E-03	3,600	8.67E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.92E-03	3,600	2.42E-04
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	1.15E-02	3,600	1.45E-03
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.48E-02	3,600	1.87E-03
87-65-0	Dichlorophenol, 2,6-	5.48E-07	8.77E-03	3,600	1.10E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	5.92E-03	3,600	7.46E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	2.08E-02	3,600	2.62E-03
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	9.76E-03	3,600	1.23E-03
84-66-2	Diethyl phthalate	8.00E-07	1.28E-02	3,600	1.61E-03
105-05-5	Diethylbenzene, 1,4-	6.70E-07	1.07E-02	3,600	1.35E-03
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	1.10E-01	3,600	1.39E-02
131-11-3	Dimethyl phthalate	5.48E-07	8.77E-03	3,600	1.10E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	8.77E-03	3,600	1.10E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	4.32E-01	3,600	5.44E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	2.24E-02	3,600	2.82E-03
79-29-8	Dimethylbutane, 2,3-	3.50E-06	5.60E-02	3,600	7.06E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	2.24E-01	3,600	2.82E-02
108-08-7	Dimethylpentane, 2,4-	5.20E-06	8.32E-02	3,600	1.05E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.76E-01	3,600	2.22E-02
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.52E-01	3,600	1.92E-02
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	9.12E-03	3,600	1.15E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.86E-01	3,600	4.86E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	8.77E-03	3,600	1.10E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	9.01E-03	3,600	1.14E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	5.92E-02	3,600	7.46E-03
123-91-1	Dioxane, 1,4-	6.40E-07	1.02E-02	3,600	1.29E-03
122-39-4	Diphenylamine	5.48E-07	8.77E-03	3,600	1.10E-03
100-41-4	Ethyl Benzene	1.10E-05	1.76E-01	3,600	2.22E-02
60-29-7	Ethyl Ether	2.50E-06	4.00E-02	3,600	5.04E-03
97-63-2	Ethyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
611-14-3	Ethyltoluene, 2-	4.50E-07	7.20E-03	3,600	9.07E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	7.68E-02	3,600	9.68E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	8.48E-02	3,600	1.07E-02
206-44-0	Fluoranthene	2.63E-06	4.21E-02	3,600	5.30E-03
86-73-7	Fluorene	6.53E-07	1.04E-02	3,600	1.32E-03
50-00-0	Formaldehyde	4.70E-05	7.52E-01	3,600	9.48E-02
7647-01-0	HCl	1.78E-02	2.85E+02	3,600	3.59E+01
118-74-1	Hexachlorobenzene	4.66E-06	7.46E-02	3,600	9.39E-03
87-68-3	Hexachlorobutadiene	8.11E-07	1.30E-02	3,600	1.63E-03
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.76E-01	3,600	2.22E-02
67-72-1	Hexachloroethane	5.91E-07	9.46E-03	3,600	1.19E-03
1888-71-7	Hexachloropropene	7.89E-07	1.26E-02	3,600	1.59E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A3**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	1.57E-01	3,600	1.98E-02
591-78-6	Hexanone, 2-	2.00E-06	3.20E-02	3,600	4.03E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	4.64E-07	3,600	5.85E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	1.17E-05	3,600	1.47E-06
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	3.04E-06	3,600	3.83E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	5.60E-08	3,600	7.06E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.42E-07	3,600	1.79E-08
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	9.76E-08	3,600	1.23E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	4.16E-06	3,600	5.24E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.92E-06	3,600	2.42E-07
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	3.04E-06	3,600	3.83E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	6.37E-03	3,600	8.02E-04
78-59-1	Isophorone	5.48E-07	8.77E-03	3,600	1.10E-03
7439-92-1	Lead	4.10E-05	6.56E-01	3,600	8.27E-02
7439-96-5	Manganese	9.40E-05	1.50E+00	3,600	1.90E-01
7439-97-6	Mercury	7.40E-08	1.18E-03	3,600	1.49E-04
126-98-7	Methacrylonitrile	5.90E-06	9.44E-02	3,600	1.19E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.56E-02	3,600	3.23E-03
1634-04-4	Methyl tert-butyl ether	1.30E-05	2.08E-01	3,600	2.62E-02
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.31E-02	3,600	1.65E-03
108-87-2	Methylcyclohexane	1.20E-05	1.92E-01	3,600	2.42E-02
75-09-2	Methylene Chloride	2.40E-04	3.84E+00	3,600	4.84E-01
540-84-1	Methylheptane, 2-	2.40E-05	3.84E-01	3,600	4.84E-02
589-81-1	Methylheptane, 3-	3.50E-06	5.60E-02	3,600	7.06E-03
591-76-4	Methylhexane, 2-	1.70E-05	2.72E-01	3,600	3.43E-02
589-34-4	Methylhexane, 3-	2.20E-05	3.52E-01	3,600	4.44E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	1.20E-01	3,600	1.51E-02
107-83-5	Methylpentane, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
96-14-0	Methylpentane, 3-	7.10E-06	1.14E-01	3,600	1.43E-02
95-48-7	Methylphenol, 2-	3.29E-06	5.26E-02	3,600	6.63E-03
91-20-3	Naphthalene	9.16E-05	1.47E+00	3,600	1.85E-01
134-32-7	Naphthylamine, 1-	1.10E-05	1.76E-01	3,600	2.22E-02
91-59-8	Naphthylamine, 2-	1.10E-05	1.76E-01	3,600	2.22E-02
7440-02-0	Nickel	5.80E-05	9.28E-01	3,600	1.17E-01
88-74-4	Nitroaniline, 2-	5.48E-07	8.77E-03	3,600	1.10E-03
99-09-2	Nitroaniline, 3-	2.19E-06	3.50E-02	3,600	4.42E-03
100-01-6	Nitroaniline, 4-	2.19E-06	3.50E-02	3,600	4.42E-03
98-95-3	Nitrobenzene	6.24E-07	9.98E-03	3,600	1.26E-03
88-75-5	Nitrophenol, 2-	4.71E-06	7.54E-02	3,600	9.50E-03
100-02-7	Nitrophenol, 4-	3.61E-06	5.78E-02	3,600	7.28E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	8.77E-03	3,600	1.10E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	8.93E-03	3,600	1.12E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	8.77E-03	3,600	1.10E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	8.77E-03	3,600	1.10E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.56E-03	3,600	1.97E-04
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.45E-02	3,600	1.83E-03
59-89-2	N-Nitrosomorpholine	5.48E-07	8.77E-03	3,600	1.10E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	1.07E-07	3,600	1.35E-08
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.28E-06	3,600	1.61E-07
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.56E-06	3,600	3.23E-07
608-93-5	Pentachlorobenzene	5.48E-07	8.77E-03	3,600	1.10E-03
76-01-7	Pentachloroethane	6.98E-07	1.12E-02	3,600	1.41E-03
82-68-8	Pentachloronitrobenzene	5.81E-07	9.30E-03	3,600	1.17E-03
87-86-5	Pentachlorophenol	2.74E-05	4.38E-01	3,600	5.52E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_A3**
lbs/event	**16,000**
lbs/hour	**16,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	7.84E-03	3,600	9.88E-04
85-01-8	Phenanthrene	3.17E-06	5.07E-02	3,600	6.39E-03
108-95-2	Phenol	2.98E-06	4.77E-02	3,600	6.01E-03
7723-14-0	Phosphorus	1.10E-04	1.76E+00	3,600	2.22E-01
123-38-6	Propanal	5.20E-05	8.32E-01	3,600	1.05E-01
103-65-1	Propylbenzene	4.60E-06	7.36E-02	3,600	9.27E-03
115-07-1	Propylene	4.90E-05	7.84E-01	3,600	9.88E-02
129-00-0	Pyrene	2.25E-06	3.60E-02	3,600	4.54E-03
110-86-1	Pyridine	8.11E-07	1.30E-02	3,600	1.63E-03
7782-49-2	Selenium	1.60E-06	2.56E-02	3,600	3.23E-03
7440-22-4	Silver	1.20E-06	1.92E-02	3,600	2.42E-03
100-42-5	Styrene	1.30E-06	2.08E-02	3,600	2.62E-03
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	3.68E-08	3,600	4.64E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	6.40E-07	3,600	8.06E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	8.77E-03	3,600	1.10E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	6.72E-03	3,600	8.47E-04
127-18-4	Tetrachloroethene	2.50E-06	4.00E-02	3,600	5.04E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	1.14E-02	3,600	1.44E-03
109-99-9	Tetrahydrofuran	9.00E-07	1.44E-02	3,600	1.81E-03
108-88-3	Toluene	2.80E-05	4.48E-01	3,600	5.64E-02
95-53-4	Toluidine, o-	7.01E-06	1.12E-01	3,600	1.41E-02
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	1.03E-02	3,600	1.30E-03
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	4.32E-03	3,600	5.44E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	1.17E-02	3,600	1.47E-03
79-01-6	Trichloroethene	9.40E-07	1.50E-02	3,600	1.90E-03
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	2.27E-02	3,600	2.86E-03
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	2.10E-02	3,600	2.64E-03
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	6.72E-03	3,600	8.47E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	4.00E-01	3,600	5.04E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	3.04E-01	3,600	3.83E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.31E-01	3,600	1.65E-02
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	8.77E-03	3,600	1.10E-03
1120-21-4	Undecane	1.20E-05	1.92E-01	3,600	2.42E-02
75-01-4	Vinyl Chloride	7.60E-06	1.22E-01	3,600	1.53E-02
95-47-6	Xylene, o-	1.30E-05	2.08E-01	3,600	2.62E-02
7440-66-6	Zinc	5.60E-05	8.96E-01	3,600	1.13E-01
3268-87-9	OCDD	3.70E-11	5.92E-07	3,600	7.46E-08
39001-02-0	OCDF	5.30E-10	8.48E-06	3,600	1.07E-06
108-38-3	Xylene, m-	1.10E-05	1.76E-01	3,600	2.22E-02
106-42-3	Xylene, p-	1.10E-05	1.76E-01	3,600	2.22E-02
108-39-4	Methylphenol, 3-	1.29E-07	2.06E-03	3,600	2.59E-04
106-44-5	Methylphenol, 4-	1.29E-07	2.06E-03	3,600	2.59E-04
529-20-4	Tolualdehyde, o-	4.00E-05	6.40E-01	3,600	8.06E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_B**
lbs/event	**125,000**
lbs/hour	**125,000**

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
			Calculated Emission Rate		
83-32-9	Acenaphthene	5.48E-07	6.85E-02	3,600	8.63E-03
208-96-8	Acenaphthylene	3.08E-06	3.85E-01	3,600	4.85E-02
75-07-0	Acetaldehyde	9.30E-05	1.16E+01	3,600	1.46E+00
67-64-1	Acetone	2.40E-05	3.00E+00	3,600	3.78E-01
75-05-8	Acetonitrile	1.90E-05	2.38E+00	3,600	2.99E-01
98-86-2	Acetophenone	2.68E-06	3.35E-01	3,600	4.22E-02
107-13-1	Acrylonitrile	1.60E-05	2.00E+00	3,600	2.52E-01
100-44-7	alpha-Chlorotoluene	5.70E-07	7.13E-02	3,600	8.98E-03
7429-90-5	Aluminum	4.00E-02	5.00E+03	3,600	6.30E+02
92-67-1	Aminobiphenyl, 4-	1.10E-05	1.38E+00	3,600	1.73E-01
62-53-3	Aniline	8.00E-06	1.00E+00	3,600	1.26E-01
120-12-7	Anthracene	1.30E-07	1.63E-02	3,600	2.05E-03
7440-36-0	Antimony	2.90E-05	3.63E+00	3,600	4.57E-01
7440-38-2	Arsenic	5.50E-07	6.88E-02	3,600	8.66E-03
7440-39-3	Barium	3.90E-07	4.88E-02	3,600	6.14E-03
100-52-7	Benzaldehyde	3.80E-05	4.75E+00	3,600	5.99E-01
71-43-2	Benzene	1.20E-04	1.50E+01	3,600	1.89E+00
56-55-3	Benzo(a)anthracene	5.86E-07	7.33E-02	3,600	9.23E-03
50-32-8	Benzo(a)pyrene	7.69E-08	9.61E-03	3,600	1.21E-03
205-99-2	Benzo(b)fluoranthene	1.15E-06	1.44E-01	3,600	1.81E-02
191-24-2	Benzo(ghi)perylene	4.55E-07	5.69E-02	3,600	7.17E-03
207-08-9	Benzo(k)fluoranthene	1.15E-06	1.44E-01	3,600	1.81E-02
65-85-0	Benzoic acid	6.24E-05	7.80E+00	3,600	9.83E-01
100-51-6	Benzyl alcohol	7.77E-07	9.71E-02	3,600	1.22E-02
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	6.85E-02	3,600	8.63E-03
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	7.66E-02	3,600	9.65E-03
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	1.46E-01	3,600	1.84E-02
75-27-4	Bromodichloro methane	7.80E-07	9.75E-02	3,600	1.23E-02
75-25-2	Bromoform	1.30E-06	1.63E-01	3,600	2.05E-02
74-83-9	Bromomethane	1.20E-07	1.50E-02	3,600	1.89E-03
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	6.85E-02	3,600	8.63E-03
78-93-3	Butanone (MEK), 2-	3.90E-06	4.88E-01	3,600	6.14E-02
106-98-9	Butene, 1-	2.20E-05	2.75E+00	3,600	3.47E-01
590-18-1	Butene, cis-2-	1.70E-06	2.13E-01	3,600	2.68E-02
624-64-6	butene, trans-2-	7.70E-06	9.63E-01	3,600	1.21E-01
85-68-7	Butyl benzyl phthalate	1.50E-07	1.88E-02	3,600	2.36E-03
7440-43-9	Cadmium	4.70E-08	5.88E-03	3,600	7.40E-04
86-74-8	Carbazole	7.01E-07	8.76E-02	3,600	1.10E-02
75-15-0	Carbon Disulfide	9.80E-06	1.23E+00	3,600	1.54E-01
56-23-5	Carbon Tetrachloride	1.50E-05	1.88E+00	3,600	2.36E-01
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	8.49E-02	3,600	1.07E-02
107-14-2	Chloroacetonitrile	1.10E-06	1.38E-01	3,600	1.73E-02
106-47-8	Chloroaniline, 4-	1.55E-07	1.94E-02	3,600	2.44E-03
108-90-7	Chlorobenzene	2.50E-06	3.13E-01	3,600	3.94E-02
75-00-3	Chloroethane	4.40E-07	5.50E-02	3,600	6.93E-03
67-66-3	Chloroform	6.10E-06	7.63E-01	3,600	9.61E-02
74-87-3	Chloromethane	1.40E-05	1.75E+00	3,600	2.21E-01
90-13-1	Chloronaphthalene, 1-	5.48E-07	6.85E-02	3,600	8.63E-03
91-58-7	Chloronaphthalene, 2-	5.48E-07	6.85E-02	3,600	8.63E-03
95-57-8	Chlorophenol, 2-	1.92E-06	2.40E-01	3,600	3.02E-02
7440-47-3	Chromium (III)	1.10E-05	1.38E+00	3,600	1.73E-01
18540-29-9	Chromium (VI)	9.00E-06	1.13E+00	3,600	1.42E-01
218-01-9	Chrysene	7.23E-07	9.04E-02	3,600	1.14E-02
7782-50-5	Cl2	1.18E-02	1.48E+03	3,600	1.86E+02
7440-48-4	Cobalt	1.20E-07	1.50E-02	3,600	1.89E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_B**
lbs/event	**125,000**
lbs/hour	**125,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	3.13E+00	3,600	3.94E-01
4170-30-3	Crotonaldehyde	3.20E-06	4.00E-01	3,600	5.04E-02
98-82-8	Cumene	4.20E-07	5.25E-02	3,600	6.62E-03
110-82-7	Cyclohexane	2.50E-06	3.13E-01	3,600	3.94E-02
53-70-3	Dibenz(a,h)anthracene	1.02E-07	1.28E-02	3,600	1.61E-03
132-64-9	Dibenzofuran	5.48E-07	6.85E-02	3,600	8.63E-03
124-48-1	Dibromochloromethane	8.80E-07	1.10E-01	3,600	1.39E-02
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	1.11E-01	3,600	1.40E-02
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	6.99E-02	3,600	8.80E-03
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	7.80E-02	3,600	9.83E-03
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	7.26E-02	3,600	9.15E-03
75-34-3	Dichloroethane, 1,1-	3.20E-07	4.00E-02	3,600	5.04E-03
107-06-2	Dichloroethane, 1,2-	5.40E-07	6.75E-02	3,600	8.51E-03
75-35-4	Dichloroethene, 1,1-	4.30E-07	5.38E-02	3,600	6.77E-03
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	1.50E-02	3,600	1.89E-03
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	9.00E-02	3,600	1.13E-02
120-83-2	Dichlorophenol, 2,4-	9.26E-07	1.16E-01	3,600	1.46E-02
87-65-0	Dichlorophenol, 2,6-	5.48E-07	6.85E-02	3,600	8.63E-03
78-87-5	Dichloropropane, 1,2-	3.70E-07	4.63E-02	3,600	5.83E-03
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	1.63E-01	3,600	2.05E-02
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	7.63E-02	3,600	9.61E-03
84-66-2	Diethyl phthalate	8.00E-07	1.00E-01	3,600	1.26E-02
105-05-5	Diethylbenzene, 1,4-	6.70E-07	8.38E-02	3,600	1.06E-02
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	8.63E-01	3,600	1.09E-01
131-11-3	Dimethyl phthalate	5.48E-07	6.85E-02	3,600	8.63E-03
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	6.85E-02	3,600	8.63E-03
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	3.38E+00	3,600	4.25E-01
75-83-2	Dimethylbutane, 2,2-	1.40E-06	1.75E-01	3,600	2.21E-02
79-29-8	Dimethylbutane, 2,3-	3.50E-06	4.38E-01	3,600	5.51E-02
565-59-3	Dimethylpentane, 2,3-	1.40E-05	1.75E+00	3,600	2.21E-01
108-08-7	Dimethylpentane, 2,4-	5.20E-06	6.50E-01	3,600	8.19E-02
84-74-2	Di-n-butyl phthalate	1.10E-05	1.38E+00	3,600	1.73E-01
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	1.19E+00	3,600	1.50E-01
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	7.13E-02	3,600	8.98E-03
51-28-5	Dinitrophenol, 2,4-	2.41E-05	3.01E+00	3,600	3.80E-01
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	6.85E-02	3,600	8.63E-03
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	7.04E-02	3,600	8.87E-03
117-84-0	Di-n-octyl phthalate	3.70E-06	4.63E-01	3,600	5.83E-02
123-91-1	Dioxane, 1,4-	6.40E-07	8.00E-02	3,600	1.01E-02
122-39-4	Diphenylamine	5.48E-07	6.85E-02	3,600	8.63E-03
100-41-4	Ethyl Benzene	1.10E-05	1.38E+00	3,600	1.73E-01
60-29-7	Ethyl Ether	2.50E-06	3.13E-01	3,600	3.94E-02
97-63-2	Ethyl Methacrylate	1.60E-06	2.00E-01	3,600	2.52E-02
611-14-3	Ethyltoluene, 2-	4.50E-07	5.63E-02	3,600	7.09E-03
620-14-4	Ethyltoluene, 3-	4.80E-06	6.00E-01	3,600	7.56E-02
622-96-8	Ethyltoluene, 4-	5.30E-06	6.63E-01	3,600	8.35E-02
206-44-0	Fluoranthene	2.63E-06	3.29E-01	3,600	4.14E-02
86-73-7	Fluorene	6.53E-07	8.16E-02	3,600	1.03E-02
50-00-0	Formaldehyde	4.70E-05	5.88E+00	3,600	7.40E-01
7647-01-0	HCl	1.78E-02	2.23E+03	3,600	2.80E+02
118-74-1	Hexachlorobenzene	4.66E-06	5.83E-01	3,600	7.34E-02
87-68-3	Hexachlorobutadiene	8.11E-07	1.01E-01	3,600	1.28E-02
77-47-4	Hexachlorocyclopentadiene	1.10E-05	1.38E+00	3,600	1.73E-01
67-72-1	Hexachloroethane	5.91E-07	7.39E-02	3,600	9.31E-03
1888-71-7	Hexachloropropene	7.89E-07	9.86E-02	3,600	1.24E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_B**
lbs/event	**125,000**
lbs/hour	**125,000**

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
			Calculated Emission Rate		
110-54-3	Hexane	9.80E-06	1.23E+00	3,600	1.54E-01
591-78-6	Hexanone, 2-	2.00E-06	2.50E-01	3,600	3.15E-02
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	3.63E-06	3,600	4.57E-07
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	9.13E-05	3,600	1.15E-05
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	2.38E-05	3,600	2.99E-06
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	4.38E-07	3,600	5.51E-08
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	1.11E-06	3,600	1.40E-07
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	7.63E-07	3,600	9.61E-08
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	3.25E-05	3,600	4.10E-06
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	2.00E-05	3,600	2.52E-06
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	1.50E-05	3,600	1.89E-06
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	2.38E-05	3,600	2.99E-06
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	4.98E-02	3,600	6.27E-03
78-59-1	Isophorone	5.48E-07	6.85E-02	3,600	8.63E-03
7439-92-1	Lead	4.10E-05	5.13E+00	3,600	6.46E-01
7439-96-5	Manganese	9.40E-05	1.18E+01	3,600	1.48E+00
7439-97-6	Mercury	7.40E-08	9.25E-03	3,600	1.17E-03
126-98-7	Methacrylonitrile	5.90E-06	7.38E-01	3,600	9.29E-02
80-62-6	Methyl Methacrylate	1.60E-06	2.00E-01	3,600	2.52E-02
1634-04-4	Methyl tert-butyl ether	1.30E-05	1.63E+00	3,600	2.05E-01
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	1.03E-01	3,600	1.29E-02
108-87-2	Methylcyclohexane	1.20E-05	1.50E+00	3,600	1.89E-01
75-09-2	Methylene Chloride	2.40E-04	3.00E+01	3,600	3.78E+00
540-84-1	Methylheptane, 2-	2.40E-05	3.00E+00	3,600	3.78E-01
589-81-1	Methylheptane, 3-	3.50E-06	4.38E-01	3,600	5.51E-02
591-76-4	Methylhexane, 2-	1.70E-05	2.13E+00	3,600	2.68E-01
589-34-4	Methylhexane, 3-	2.20E-05	2.75E+00	3,600	3.47E-01
91-57-6	Methylnaphthalene, 2-	7.47E-06	9.34E-01	3,600	1.18E-01
107-83-5	Methylpentane, 2-	1.10E-05	1.38E+00	3,600	1.73E-01
96-14-0	Methylpentane, 3-	7.10E-06	8.88E-01	3,600	1.12E-01
95-48-7	Methylphenol, 2-	3.29E-06	4.11E-01	3,600	5.18E-02
91-20-3	Naphthalene	9.16E-05	1.15E+01	3,600	1.44E+00
134-32-7	Naphthylamine, 1-	1.10E-05	1.38E+00	3,600	1.73E-01
91-59-8	Naphthylamine, 2-	1.10E-05	1.38E+00	3,600	1.73E-01
7440-02-0	Nickel	5.80E-05	7.25E+00	3,600	9.14E-01
88-74-4	Nitroaniline, 2-	5.48E-07	6.85E-02	3,600	8.63E-03
99-09-2	Nitroaniline, 3-	2.19E-06	2.74E-01	3,600	3.45E-02
100-01-6	Nitroaniline, 4-	2.19E-06	2.74E-01	3,600	3.45E-02
98-95-3	Nitrobenzene	6.24E-07	7.80E-02	3,600	9.83E-03
88-75-5	Nitrophenol, 2-	4.71E-06	5.89E-01	3,600	7.42E-02
100-02-7	Nitrophenol, 4-	3.61E-06	4.51E-01	3,600	5.69E-02
55-18-5	N-Nitrosodiethylamine	5.48E-07	6.85E-02	3,600	8.63E-03
62-75-9	N-Nitrosodimethylamine	5.58E-07	6.98E-02	3,600	8.79E-03
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	6.85E-02	3,600	8.63E-03
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	6.85E-02	3,600	8.63E-03
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	1.22E-02	3,600	1.54E-03
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	1.14E-01	3,600	1.43E-02
59-89-2	N-Nitrosomorpholine	5.48E-07	6.85E-02	3,600	8.63E-03
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	8.38E-07	3,600	1.06E-07
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	1.00E-05	3,600	1.26E-06
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	2.00E-05	3,600	2.52E-06
608-93-5	Pentachlorobenzene	5.48E-07	6.85E-02	3,600	8.63E-03
76-01-7	Pentachloroethane	6.98E-07	8.73E-02	3,600	1.10E-02
82-68-8	Pentachloronitrobenzene	5.81E-07	7.26E-02	3,600	9.15E-03
87-86-5	Pentachlorophenol	2.74E-05	3.43E+00	3,600	4.32E-01

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_B**
lbs/event	**125,000**
lbs/hour	**125,000**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	6.13E-02	3,600	7.72E-03
85-01-8	Phenanthrene	3.17E-06	3.96E-01	3,600	4.99E-02
108-95-2	Phenol	2.98E-06	3.73E-01	3,600	4.69E-02
7723-14-0	Phosphorus	1.10E-04	1.38E+01	3,600	1.73E+00
123-38-6	Propanal	5.20E-05	6.50E+00	3,600	8.19E-01
103-65-1	Propylbenzene	4.60E-06	5.75E-01	3,600	7.25E-02
115-07-1	Propylene	4.90E-05	6.13E+00	3,600	7.72E-01
129-00-0	Pyrene	2.25E-06	2.81E-01	3,600	3.54E-02
110-86-1	Pyridine	8.11E-07	1.01E-01	3,600	1.28E-02
7782-49-2	Selenium	1.60E-06	2.00E-01	3,600	2.52E-02
7440-22-4	Silver	1.20E-06	1.50E-01	3,600	1.89E-02
100-42-5	Styrene	1.30E-06	1.63E-01	3,600	2.05E-02
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	2.88E-07	3,600	3.62E-08
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	5.00E-06	3,600	6.30E-07
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	6.85E-02	3,600	8.63E-03
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	5.25E-02	3,600	6.62E-03
127-18-4	Tetrachloroethene	2.50E-06	3.13E-01	3,600	3.94E-02
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	8.90E-02	3,600	1.12E-02
109-99-9	Tetrahydrofuran	9.00E-07	1.13E-01	3,600	1.42E-02
108-88-3	Toluene	2.80E-05	3.50E+00	3,600	4.41E-01
95-53-4	Toluidine, o-	7.01E-06	8.76E-01	3,600	1.10E-01
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	8.08E-02	3,600	1.02E-02
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	3.38E-02	3,600	4.25E-03
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	9.13E-02	3,600	1.15E-02
79-01-6	Trichloroethene	9.40E-07	1.18E-01	3,600	1.48E-02
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	1.78E-01	3,600	2.24E-02
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	1.64E-01	3,600	2.06E-02
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	5.25E-02	3,600	6.62E-03
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	3.13E+00	3,600	3.94E-01
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	2.38E+00	3,600	2.99E-01
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	1.03E+00	3,600	1.29E-01
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	6.85E-02	3,600	8.63E-03
1120-21-4	Undecane	1.20E-05	1.50E+00	3,600	1.89E-01
75-01-4	Vinyl Chloride	7.60E-06	9.50E-01	3,600	1.20E-01
95-47-6	Xylene, o-	1.30E-05	1.63E+00	3,600	2.05E-01
7440-66-6	Zinc	5.60E-05	7.00E+00	3,600	8.82E-01
3268-87-9	OCDD	3.70E-11	4.63E-06	3,600	5.83E-07
39001-02-0	OCDF	5.30E-10	6.63E-05	3,600	8.35E-06
108-38-3	Xylene, m-	1.10E-05	1.38E+00	3,600	1.73E-01
106-42-3	Xylene, p-	1.10E-05	1.38E+00	3,600	1.73E-01
108-39-4	Methylphenol, 3-	1.29E-07	1.61E-02	3,600	2.02E-03
106-44-5	Methylphenol, 4-	1.29E-07	1.61E-02	3,600	2.02E-03
529-20-4	Tolualdehyde, o-	4.00E-05	5.00E+00	3,600	6.30E-01

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C13**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	3.29E-04	3,600	4.14E-05
208-96-8	Acenaphthylene	3.08E-06	1.85E-03	3,600	2.33E-04
75-07-0	Acetaldehyde	9.30E-05	5.58E-02	3,600	7.03E-03
67-64-1	Acetone	2.40E-05	1.44E-02	3,600	1.81E-03
75-05-8	Acetonitrile	1.90E-05	1.14E-02	3,600	1.44E-03
98-86-2	Acetophenone	2.68E-06	1.61E-03	3,600	2.03E-04
107-13-1	Acrylonitrile	1.60E-05	9.60E-03	3,600	1.21E-03
100-44-7	alpha-Chlorotoluene	5.70E-07	3.42E-04	3,600	4.31E-05
7429-90-5	Aluminum	4.00E-02	2.40E+01	3,600	3.02E+00
92-67-1	Aminobiphenyl, 4-	1.10E-05	6.60E-03	3,600	8.32E-04
62-53-3	Aniline	8.00E-06	4.80E-03	3,600	6.05E-04
120-12-7	Anthracene	1.30E-07	7.80E-05	3,600	9.83E-06
7440-36-0	Antimony	2.90E-05	1.74E-02	3,600	2.19E-03
7440-38-2	Arsenic	5.50E-07	3.30E-04	3,600	4.16E-05
7440-39-3	Barium	3.90E-07	2.34E-04	3,600	2.95E-05
100-52-7	Benzaldehyde	3.80E-05	2.28E-02	3,600	2.87E-03
71-43-2	Benzene	1.20E-04	7.20E-02	3,600	9.07E-03
56-55-3	Benzo(a)anthracene	5.86E-07	3.52E-04	3,600	4.43E-05
50-32-8	Benzo(a)pyrene	7.69E-08	4.61E-05	3,600	5.81E-06
205-99-2	Benzo(b)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
191-24-2	Benzo(ghi)perylene	4.55E-07	2.73E-04	3,600	3.44E-05
207-08-9	Benzo(k)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
65-85-0	Benzoic acid	6.24E-05	3.74E-02	3,600	4.72E-03
100-51-6	Benzyl alcohol	7.77E-07	4.66E-04	3,600	5.87E-05
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	3.29E-04	3,600	4.14E-05
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	3.68E-04	3,600	4.63E-05
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	7.02E-04	3,600	8.85E-05
75-27-4	Bromodichloro methane	7.80E-07	4.68E-04	3,600	5.90E-05
75-25-2	Bromoform	1.30E-06	7.80E-04	3,600	9.83E-05
74-83-9	Bromomethane	1.20E-07	7.20E-05	3,600	9.07E-06
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	3.29E-04	3,600	4.14E-05
78-93-3	Butanone (MEK), 2-	3.90E-06	2.34E-03	3,600	2.95E-04
106-98-9	Butene, 1-	2.20E-05	1.32E-02	3,600	1.66E-03
590-18-1	Butene, cis-2-	1.70E-06	1.02E-03	3,600	1.29E-04
624-64-6	butene, trans-2-	7.70E-06	4.62E-03	3,600	5.82E-04
85-68-7	Butyl benzyl phthalate	1.50E-07	9.00E-05	3,600	1.13E-05
7440-43-9	Cadmium	4.70E-08	2.82E-05	3,600	3.55E-06
86-74-8	Carbazole	7.01E-07	4.21E-04	3,600	5.30E-05
75-15-0	Carbon Disulfide	9.80E-06	5.88E-03	3,600	7.41E-04
56-23-5	Carbon Tetrachloride	1.50E-05	9.00E-03	3,600	1.13E-03
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	4.07E-04	3,600	5.13E-05
107-14-2	Chloroacetonitrile	1.10E-06	6.60E-04	3,600	8.32E-05
106-47-8	Chloroaniline, 4-	1.55E-07	9.30E-05	3,600	1.17E-05
108-90-7	Chlorobenzene	2.50E-06	1.50E-03	3,600	1.89E-04
75-00-3	Chloroethane	4.40E-07	2.64E-04	3,600	3.33E-05
67-66-3	Chloroform	6.10E-06	3.66E-03	3,600	4.61E-04
74-87-3	Chloromethane	1.40E-05	8.40E-03	3,600	1.06E-03
90-13-1	Chloronaphthalene, 1-	5.48E-07	3.29E-04	3,600	4.14E-05
91-58-7	Chloronaphthalene, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
95-57-8	Chlorophenol, 2-	1.92E-06	1.15E-03	3,600	1.45E-04
7440-47-3	Chromium (III)	1.10E-05	6.60E-03	3,600	8.32E-04
18540-29-9	Chromium (VI)	9.00E-06	5.40E-03	3,600	6.80E-04
218-01-9	Chrysene	7.23E-07	4.34E-04	3,600	5.47E-05
7782-50-5	Cl2	1.18E-02	7.08E+00	3,600	8.92E-01
7440-48-4	Cobalt	1.20E-07	7.20E-05	3,600	9.07E-06

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C13**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	1.50E-02	3,600	1.89E-03
4170-30-3	Crotonaldehyde	3.20E-06	1.92E-03	3,600	2.42E-04
98-82-8	Cumene	4.20E-07	2.52E-04	3,600	3.18E-05
110-82-7	Cyclohexane	2.50E-06	1.50E-03	3,600	1.89E-04
53-70-3	Dibenz(a,h)anthracene	1.02E-07	6.12E-05	3,600	7.71E-06
132-64-9	Dibenzofuran	5.48E-07	3.29E-04	3,600	4.14E-05
124-48-1	Dibromochloromethane	8.80E-07	5.28E-04	3,600	6.65E-05
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	5.34E-04	3,600	6.73E-05
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	3.35E-04	3,600	4.23E-05
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	3.74E-04	3,600	4.72E-05
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	3.49E-04	3,600	4.39E-05
75-34-3	Dichloroethane, 1,1-	3.20E-07	1.92E-04	3,600	2.42E-05
107-06-2	Dichloroethane, 1,2-	5.40E-07	3.24E-04	3,600	4.08E-05
75-35-4	Dichloroethene, 1,1-	4.30E-07	2.58E-04	3,600	3.25E-05
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	7.20E-05	3,600	9.07E-06
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	4.32E-04	3,600	5.44E-05
120-83-2	Dichlorophenol, 2,4-	9.26E-07	5.56E-04	3,600	7.00E-05
87-65-0	Dichlorophenol, 2,6-	5.48E-07	3.29E-04	3,600	4.14E-05
78-87-5	Dichloropropane, 1,2-	3.70E-07	2.22E-04	3,600	2.80E-05
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	7.80E-04	3,600	9.83E-05
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	3.66E-04	3,600	4.61E-05
84-66-2	Diethyl phthalate	8.00E-07	4.80E-04	3,600	6.05E-05
105-05-5	Diethylbenzene, 1,4-	6.70E-07	4.02E-04	3,600	5.07E-05
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	4.14E-03	3,600	5.22E-04
131-11-3	Dimethyl phthalate	5.48E-07	3.29E-04	3,600	4.14E-05
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	3.29E-04	3,600	4.14E-05
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	1.62E-02	3,600	2.04E-03
75-83-2	Dimethylbutane, 2,2-	1.40E-06	8.40E-04	3,600	1.06E-04
79-29-8	Dimethylbutane, 2,3-	3.50E-06	2.10E-03	3,600	2.65E-04
565-59-3	Dimethylpentane, 2,3-	1.40E-05	8.40E-03	3,600	1.06E-03
108-08-7	Dimethylpentane, 2,4-	5.20E-06	3.12E-03	3,600	3.93E-04
84-74-2	Di-n-butyl phthalate	1.10E-05	6.60E-03	3,600	8.32E-04
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	5.72E-03	3,600	7.20E-04
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	3.42E-04	3,600	4.31E-05
51-28-5	Dinitrophenol, 2,4-	2.41E-05	1.45E-02	3,600	1.82E-03
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	3.29E-04	3,600	4.14E-05
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	3.38E-04	3,600	4.26E-05
117-84-0	Di-n-octyl phthalate	3.70E-06	2.22E-03	3,600	2.80E-04
123-91-1	Dioxane, 1,4-	6.40E-07	3.84E-04	3,600	4.84E-05
122-39-4	Diphenylamine	5.48E-07	3.29E-04	3,600	4.14E-05
100-41-4	Ethyl Benzene	1.10E-05	6.60E-03	3,600	8.32E-04
60-29-7	Ethyl Ether	2.50E-06	1.50E-03	3,600	1.89E-04
97-63-2	Ethyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
611-14-3	Ethyltoluene, 2-	4.50E-07	2.70E-04	3,600	3.40E-05
620-14-4	Ethyltoluene, 3-	4.80E-06	2.88E-03	3,600	3.63E-04
622-96-8	Ethyltoluene, 4-	5.30E-06	3.18E-03	3,600	4.01E-04
206-44-0	Fluoranthene	2.63E-06	1.58E-03	3,600	1.99E-04
86-73-7	Fluorene	6.53E-07	3.92E-04	3,600	4.94E-05
50-00-0	Formaldehyde	4.70E-05	2.82E-02	3,600	3.55E-03
7647-01-0	HCl	1.78E-02	1.07E+01	3,600	1.35E+00
118-74-1	Hexachlorobenzene	4.66E-06	2.80E-03	3,600	3.52E-04
87-68-3	Hexachlorobutadiene	8.11E-07	4.87E-04	3,600	6.13E-05
77-47-4	Hexachlorocyclopentadiene	1.10E-05	6.60E-03	3,600	8.32E-04
67-72-1	Hexachloroethane	5.91E-07	3.55E-04	3,600	4.47E-05
1888-71-7	Hexachloropropene	7.89E-07	4.73E-04	3,600	5.96E-05

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C13**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	5.88E-03	3,600	7.41E-04
591-78-6	Hexanone, 2-	2.00E-06	1.20E-03	3,600	1.51E-04
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	1.74E-08	3,600	2.19E-09
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	4.38E-07	3,600	5.52E-08
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	1.14E-07	3,600	1.44E-08
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	2.10E-09	3,600	2.65E-10
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	5.34E-09	3,600	6.73E-10
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	3.66E-09	3,600	4.61E-10
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	1.56E-07	3,600	1.97E-08
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	7.20E-08	3,600	9.07E-09
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	1.14E-07	3,600	1.44E-08
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	2.39E-04	3,600	3.01E-05
78-59-1	Isophorone	5.48E-07	3.29E-04	3,600	4.14E-05
7439-92-1	Lead	4.10E-05	2.46E-02	3,600	3.10E-03
7439-96-5	Manganese	9.40E-05	5.64E-02	3,600	7.11E-03
7439-97-6	Mercury	7.40E-08	4.44E-05	3,600	5.59E-06
126-98-7	Methacrylonitrile	5.90E-06	3.54E-03	3,600	4.46E-04
80-62-6	Methyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
1634-04-4	Methyl tert-butyl ether	1.30E-05	7.80E-03	3,600	9.83E-04
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	4.92E-04	3,600	6.20E-05
108-87-2	Methylcyclohexane	1.20E-05	7.20E-03	3,600	9.07E-04
75-09-2	Methylene Chloride	2.40E-04	1.44E-01	3,600	1.81E-02
540-84-1	Methylheptane, 2-	2.40E-05	1.44E-02	3,600	1.81E-03
589-81-1	Methylheptane, 3-	3.50E-06	2.10E-03	3,600	2.65E-04
591-76-4	Methylhexane, 2-	1.70E-05	1.02E-02	3,600	1.29E-03
589-34-4	Methylhexane, 3-	2.20E-05	1.32E-02	3,600	1.66E-03
91-57-6	Methylnaphthalene, 2-	7.47E-06	4.48E-03	3,600	5.65E-04
107-83-5	Methylpentane, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
96-14-0	Methylpentane, 3-	7.10E-06	4.26E-03	3,600	5.37E-04
95-48-7	Methylphenol, 2-	3.29E-06	1.97E-03	3,600	2.49E-04
91-20-3	Naphthalene	9.16E-05	5.50E-02	3,600	6.92E-03
134-32-7	Naphthylamine, 1-	1.10E-05	6.60E-03	3,600	8.32E-04
91-59-8	Naphthylamine, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
7440-02-0	Nickel	5.80E-05	3.48E-02	3,600	4.38E-03
88-74-4	Nitroaniline, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
99-09-2	Nitroaniline, 3-	2.19E-06	1.31E-03	3,600	1.66E-04
100-01-6	Nitroaniline, 4-	2.19E-06	1.31E-03	3,600	1.66E-04
98-95-3	Nitrobenzene	6.24E-07	3.74E-04	3,600	4.72E-05
88-75-5	Nitrophenol, 2-	4.71E-06	2.83E-03	3,600	3.56E-04
100-02-7	Nitrophenol, 4-	3.61E-06	2.17E-03	3,600	2.73E-04
55-18-5	N-Nitrosodiethylamine	5.48E-07	3.29E-04	3,600	4.14E-05
62-75-9	N-Nitrosodimethylamine	5.58E-07	3.35E-04	3,600	4.22E-05
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	3.29E-04	3,600	4.14E-05
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	3.29E-04	3,600	4.14E-05
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	5.85E-05	3,600	7.37E-06
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	5.45E-04	3,600	6.87E-05
59-89-2	N-Nitrosomorpholine	5.48E-07	3.29E-04	3,600	4.14E-05
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	4.02E-09	3,600	5.07E-10
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	4.80E-08	3,600	6.05E-09
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
608-93-5	Pentachlorobenzene	5.48E-07	3.29E-04	3,600	4.14E-05
76-01-7	Pentachloroethane	6.98E-07	4.19E-04	3,600	5.28E-05
82-68-8	Pentachloronitrobenzene	5.81E-07	3.49E-04	3,600	4.39E-05
87-86-5	Pentachlorophenol	2.74E-05	1.64E-02	3,600	2.07E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C13**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	2.94E-04	3,600	3.70E-05
85-01-8	Phenanthrene	3.17E-06	1.90E-03	3,600	2.40E-04
108-95-2	Phenol	2.98E-06	1.79E-03	3,600	2.25E-04
7723-14-0	Phosphorus	1.10E-04	6.60E-02	3,600	8.32E-03
123-38-6	Propanal	5.20E-05	3.12E-02	3,600	3.93E-03
103-65-1	Propylbenzene	4.60E-06	2.76E-03	3,600	3.48E-04
115-07-1	Propylene	4.90E-05	2.94E-02	3,600	3.70E-03
129-00-0	Pyrene	2.25E-06	1.35E-03	3,600	1.70E-04
110-86-1	Pyridine	8.11E-07	4.87E-04	3,600	6.13E-05
7782-49-2	Selenium	1.60E-06	9.60E-04	3,600	1.21E-04
7440-22-4	Silver	1.20E-06	7.20E-04	3,600	9.07E-05
100-42-5	Styrene	1.30E-06	7.80E-04	3,600	9.83E-05
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	1.38E-09	3,600	1.74E-10
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	2.40E-08	3,600	3.02E-09
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	3.29E-04	3,600	4.14E-05
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	2.52E-04	3,600	3.18E-05
127-18-4	Tetrachloroethene	2.50E-06	1.50E-03	3,600	1.89E-04
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	4.27E-04	3,600	5.38E-05
109-99-9	Tetrahydrofuran	9.00E-07	5.40E-04	3,600	6.80E-05
108-88-3	Toluene	2.80E-05	1.68E-02	3,600	2.12E-03
95-53-4	Toluidine, o-	7.01E-06	4.21E-03	3,600	5.30E-04
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	3.88E-04	3,600	4.88E-05
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	1.62E-04	3,600	2.04E-05
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	4.38E-04	3,600	5.52E-05
79-01-6	Trichloroethene	9.40E-07	5.64E-04	3,600	7.11E-05
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	8.52E-04	3,600	1.07E-04
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	7.86E-04	3,600	9.90E-05
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	2.52E-04	3,600	3.18E-05
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	1.50E-02	3,600	1.89E-03
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	1.14E-02	3,600	1.44E-03
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	4.92E-03	3,600	6.20E-04
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	3.29E-04	3,600	4.14E-05
1120-21-4	Undecane	1.20E-05	7.20E-03	3,600	9.07E-04
75-01-4	Vinyl Chloride	7.60E-06	4.56E-03	3,600	5.75E-04
95-47-6	Xylene, o-	1.30E-05	7.80E-03	3,600	9.83E-04
7440-66-6	Zinc	5.60E-05	3.36E-02	3,600	4.23E-03
3268-87-9	OCDD	3.70E-11	2.22E-08	3,600	2.80E-09
39001-02-0	OCDF	5.30E-10	3.18E-07	3,600	4.01E-08
108-38-3	Xylene, m-	1.10E-05	6.60E-03	3,600	8.32E-04
106-42-3	Xylene, p-	1.10E-05	6.60E-03	3,600	8.32E-04
108-39-4	Methylphenol, 3-	1.29E-07	7.71E-05	3,600	9.71E-06
106-44-5	Methylphenol, 4-	1.29E-07	7.71E-05	3,600	9.71E-06
529-20-4	Tolualdehyde, o-	4.00E-05	2.40E-02	3,600	3.02E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C14**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	3.29E-04	3,600	4.14E-05
208-96-8	Acenaphthylene	3.08E-06	1.85E-03	3,600	2.33E-04
75-07-0	Acetaldehyde	9.30E-05	5.58E-02	3,600	7.03E-03
67-64-1	Acetone	2.40E-05	1.44E-02	3,600	1.81E-03
75-05-8	Acetonitrile	1.90E-05	1.14E-02	3,600	1.44E-03
98-86-2	Acetophenone	2.68E-06	1.61E-03	3,600	2.03E-04
107-13-1	Acrylonitrile	1.60E-05	9.60E-03	3,600	1.21E-03
100-44-7	alpha-Chlorotoluene	5.70E-07	3.42E-04	3,600	4.31E-05
7429-90-5	Aluminum	4.00E-02	2.40E+01	3,600	3.02E+00
92-67-1	Aminobiphenyl, 4-	1.10E-05	6.60E-03	3,600	8.32E-04
62-53-3	Aniline	8.00E-06	4.80E-03	3,600	6.05E-04
120-12-7	Anthracene	1.30E-07	7.80E-05	3,600	9.83E-06
7440-36-0	Antimony	2.90E-05	1.74E-02	3,600	2.19E-03
7440-38-2	Arsenic	5.50E-07	3.30E-04	3,600	4.16E-05
7440-39-3	Barium	3.90E-07	2.34E-04	3,600	2.95E-05
100-52-7	Benzaldehyde	3.80E-05	2.28E-02	3,600	2.87E-03
71-43-2	Benzene	1.20E-04	7.20E-02	3,600	9.07E-03
56-55-3	Benzo(a)anthracene	5.86E-07	3.52E-04	3,600	4.43E-05
50-32-8	Benzo(a)pyrene	7.69E-08	4.61E-05	3,600	5.81E-06
205-99-2	Benzo(b)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
191-24-2	Benzo(ghi)perylene	4.55E-07	2.73E-04	3,600	3.44E-05
207-08-9	Benzo(k)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
65-85-0	Benzoic acid	6.24E-05	3.74E-02	3,600	4.72E-03
100-51-6	Benzyl alcohol	7.77E-07	4.66E-04	3,600	5.87E-05
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	3.29E-04	3,600	4.14E-05
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	3.68E-04	3,600	4.63E-05
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	7.02E-04	3,600	8.85E-05
75-27-4	Bromodichloro methane	7.80E-07	4.68E-04	3,600	5.90E-05
75-25-2	Bromoform	1.30E-06	7.80E-04	3,600	9.83E-05
74-83-9	Bromomethane	1.20E-07	7.20E-05	3,600	9.07E-06
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	3.29E-04	3,600	4.14E-05
78-93-3	Butanone (MEK), 2-	3.90E-06	2.34E-03	3,600	2.95E-04
106-98-9	Butene, 1-	2.20E-05	1.32E-02	3,600	1.66E-03
590-18-1	Butene, cis-2-	1.70E-06	1.02E-03	3,600	1.29E-04
624-64-6	butene, trans-2-	7.70E-06	4.62E-03	3,600	5.82E-04
85-68-7	Butyl benzyl phthalate	1.50E-07	9.00E-05	3,600	1.13E-05
7440-43-9	Cadmium	4.70E-08	2.82E-05	3,600	3.55E-06
86-74-8	Carbazole	7.01E-07	4.21E-04	3,600	5.30E-05
75-15-0	Carbon Disulfide	9.80E-06	5.88E-03	3,600	7.41E-04
56-23-5	Carbon Tetrachloride	1.50E-05	9.00E-03	3,600	1.13E-03
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	4.07E-04	3,600	5.13E-05
107-14-2	Chloroacetonitrile	1.10E-06	6.60E-04	3,600	8.32E-05
106-47-8	Chloroaniline, 4-	1.55E-07	9.30E-05	3,600	1.17E-05
108-90-7	Chlorobenzene	2.50E-06	1.50E-03	3,600	1.89E-04
75-00-3	Chloroethane	4.40E-07	2.64E-04	3,600	3.33E-05
67-66-3	Chloroform	6.10E-06	3.66E-03	3,600	4.61E-04
74-87-3	Chloromethane	1.40E-05	8.40E-03	3,600	1.06E-03
90-13-1	Chloronaphthalene, 1-	5.48E-07	3.29E-04	3,600	4.14E-05
91-58-7	Chloronaphthalene, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
95-57-8	Chlorophenol, 2-	1.92E-06	1.15E-03	3,600	1.45E-04
7440-47-3	Chromium (III)	1.10E-05	6.60E-03	3,600	8.32E-04
18540-29-9	Chromium (VI)	9.00E-06	5.40E-03	3,600	6.80E-04
218-01-9	Chrysene	7.23E-07	4.34E-04	3,600	5.47E-05
7782-50-5	Cl2	1.18E-02	7.08E+00	3,600	8.92E-01
7440-48-4	Cobalt	1.20E-07	7.20E-05	3,600	9.07E-06

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C14**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	1.50E-02	3,600	1.89E-03
4170-30-3	Crotonaldehyde	3.20E-06	1.92E-03	3,600	2.42E-04
98-82-8	Cumene	4.20E-07	2.52E-04	3,600	3.18E-05
110-82-7	Cyclohexane	2.50E-06	1.50E-03	3,600	1.89E-04
53-70-3	Dibenz(a,h)anthracene	1.02E-07	6.12E-05	3,600	7.71E-06
132-64-9	Dibenzofuran	5.48E-07	3.29E-04	3,600	4.14E-05
124-48-1	Dibromochloromethane	8.80E-07	5.28E-04	3,600	6.65E-05
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	5.34E-04	3,600	6.73E-05
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	3.35E-04	3,600	4.23E-05
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	3.74E-04	3,600	4.72E-05
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	3.49E-04	3,600	4.39E-05
75-34-3	Dichloroethane, 1,1-	3.20E-07	1.92E-04	3,600	2.42E-05
107-06-2	Dichloroethane, 1,2-	5.40E-07	3.24E-04	3,600	4.08E-05
75-35-4	Dichloroethene, 1,1-	4.30E-07	2.58E-04	3,600	3.25E-05
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	7.20E-05	3,600	9.07E-06
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	4.32E-04	3,600	5.44E-05
120-83-2	Dichlorophenol, 2,4-	9.26E-07	5.56E-04	3,600	7.00E-05
87-65-0	Dichlorophenol, 2,6-	5.48E-07	3.29E-04	3,600	4.14E-05
78-87-5	Dichloropropane, 1,2-	3.70E-07	2.22E-04	3,600	2.80E-05
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	7.80E-04	3,600	9.83E-05
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	3.66E-04	3,600	4.61E-05
84-66-2	Diethyl phthalate	8.00E-07	4.80E-04	3,600	6.05E-05
105-05-5	Diethylbenzene, 1,4-	6.70E-07	4.02E-04	3,600	5.07E-05
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	4.14E-03	3,600	5.22E-04
131-11-3	Dimethyl phthalate	5.48E-07	3.29E-04	3,600	4.14E-05
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	3.29E-04	3,600	4.14E-05
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	1.62E-02	3,600	2.04E-03
75-83-2	Dimethylbutane, 2,2-	1.40E-06	8.40E-04	3,600	1.06E-04
79-29-8	Dimethylbutane, 2,3-	3.50E-06	2.10E-03	3,600	2.65E-04
565-59-3	Dimethylpentane, 2,3-	1.40E-05	8.40E-03	3,600	1.06E-03
108-08-7	Dimethylpentane, 2,4-	5.20E-06	3.12E-03	3,600	3.93E-04
84-74-2	Di-n-butyl phthalate	1.10E-05	6.60E-03	3,600	8.32E-04
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	5.72E-03	3,600	7.20E-04
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	3.42E-04	3,600	4.31E-05
51-28-5	Dinitrophenol, 2,4-	2.41E-05	1.45E-02	3,600	1.82E-03
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	3.29E-04	3,600	4.14E-05
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	3.38E-04	3,600	4.26E-05
117-84-0	Di-n-octyl phthalate	3.70E-06	2.22E-03	3,600	2.80E-04
123-91-1	Dioxane, 1,4-	6.40E-07	3.84E-04	3,600	4.84E-05
122-39-4	Diphenylamine	5.48E-07	3.29E-04	3,600	4.14E-05
100-41-4	Ethyl Benzene	1.10E-05	6.60E-03	3,600	8.32E-04
60-29-7	Ethyl Ether	2.50E-06	1.50E-03	3,600	1.89E-04
97-63-2	Ethyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
611-14-3	Ethyltoluene, 2-	4.50E-07	2.70E-04	3,600	3.40E-05
620-14-4	Ethyltoluene, 3-	4.80E-06	2.88E-03	3,600	3.63E-04
622-96-8	Ethyltoluene, 4-	5.30E-06	3.18E-03	3,600	4.01E-04
206-44-0	Fluoranthene	2.63E-06	1.58E-03	3,600	1.99E-04
86-73-7	Fluorene	6.53E-07	3.92E-04	3,600	4.94E-05
50-00-0	Formaldehyde	4.70E-05	2.82E-02	3,600	3.55E-03
7647-01-0	HCl	1.78E-02	1.07E+01	3,600	1.35E+00
118-74-1	Hexachlorobenzene	4.66E-06	2.80E-03	3,600	3.52E-04
87-68-3	Hexachlorobutadiene	8.11E-07	4.87E-04	3,600	6.13E-05
77-47-4	Hexachlorocyclopentadiene	1.10E-05	6.60E-03	3,600	8.32E-04
67-72-1	Hexachloroethane	5.91E-07	3.55E-04	3,600	4.47E-05
1888-71-7	Hexachloropropene	7.89E-07	4.73E-04	3,600	5.96E-05

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C14**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	5.88E-03	3,600	7.41E-04
591-78-6	Hexanone, 2-	2.00E-06	1.20E-03	3,600	1.51E-04
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	1.74E-08	3,600	2.19E-09
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	4.38E-07	3,600	5.52E-08
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	1.14E-07	3,600	1.44E-08
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	2.10E-09	3,600	2.65E-10
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	5.34E-09	3,600	6.73E-10
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	3.66E-09	3,600	4.61E-10
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	1.56E-07	3,600	1.97E-08
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	7.20E-08	3,600	9.07E-09
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	1.14E-07	3,600	1.44E-08
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	2.39E-04	3,600	3.01E-05
78-59-1	Isophorone	5.48E-07	3.29E-04	3,600	4.14E-05
7439-92-1	Lead	4.10E-05	2.46E-02	3,600	3.10E-03
7439-96-5	Manganese	9.40E-05	5.64E-02	3,600	7.11E-03
7439-97-6	Mercury	7.40E-08	4.44E-05	3,600	5.59E-06
126-98-7	Methacrylonitrile	5.90E-06	3.54E-03	3,600	4.46E-04
80-62-6	Methyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
1634-04-4	Methyl tert-butyl ether	1.30E-05	7.80E-03	3,600	9.83E-04
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	4.92E-04	3,600	6.20E-05
108-87-2	Methylcyclohexane	1.20E-05	7.20E-03	3,600	9.07E-04
75-09-2	Methylene Chloride	2.40E-04	1.44E-01	3,600	1.81E-02
540-84-1	Methylheptane, 2-	2.40E-05	1.44E-02	3,600	1.81E-03
589-81-1	Methylheptane, 3-	3.50E-06	2.10E-03	3,600	2.65E-04
591-76-4	Methylhexane, 2-	1.70E-05	1.02E-02	3,600	1.29E-03
589-34-4	Methylhexane, 3-	2.20E-05	1.32E-02	3,600	1.66E-03
91-57-6	Methylnaphthalene, 2-	7.47E-06	4.48E-03	3,600	5.65E-04
107-83-5	Methylpentane, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
96-14-0	Methylpentane, 3-	7.10E-06	4.26E-03	3,600	5.37E-04
95-48-7	Methylphenol, 2-	3.29E-06	1.97E-03	3,600	2.49E-04
91-20-3	Naphthalene	9.16E-05	5.50E-02	3,600	6.92E-03
134-32-7	Naphthylamine, 1-	1.10E-05	6.60E-03	3,600	8.32E-04
91-59-8	Naphthylamine, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
7440-02-0	Nickel	5.80E-05	3.48E-02	3,600	4.38E-03
88-74-4	Nitroaniline, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
99-09-2	Nitroaniline, 3-	2.19E-06	1.31E-03	3,600	1.66E-04
100-01-6	Nitroaniline, 4-	2.19E-06	1.31E-03	3,600	1.66E-04
98-95-3	Nitrobenzene	6.24E-07	3.74E-04	3,600	4.72E-05
88-75-5	Nitrophenol, 2-	4.71E-06	2.83E-03	3,600	3.56E-04
100-02-7	Nitrophenol, 4-	3.61E-06	2.17E-03	3,600	2.73E-04
55-18-5	N-Nitrosodiethylamine	5.48E-07	3.29E-04	3,600	4.14E-05
62-75-9	N-Nitrosodimethylamine	5.58E-07	3.35E-04	3,600	4.22E-05
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	3.29E-04	3,600	4.14E-05
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	3.29E-04	3,600	4.14E-05
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	5.85E-05	3,600	7.37E-06
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	5.45E-04	3,600	6.87E-05
59-89-2	N-Nitrosomorpholine	5.48E-07	3.29E-04	3,600	4.14E-05
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	4.02E-09	3,600	5.07E-10
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	4.80E-08	3,600	6.05E-09
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
608-93-5	Pentachlorobenzene	5.48E-07	3.29E-04	3,600	4.14E-05
76-01-7	Pentachloroethane	6.98E-07	4.19E-04	3,600	5.28E-05
82-68-8	Pentachloronitrobenzene	5.81E-07	3.49E-04	3,600	4.39E-05
87-86-5	Pentachlorophenol	2.74E-05	1.64E-02	3,600	2.07E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M136_C14**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	2.94E-04	3,600	3.70E-05
85-01-8	Phenanthrene	3.17E-06	1.90E-03	3,600	2.40E-04
108-95-2	Phenol	2.98E-06	1.79E-03	3,600	2.25E-04
7723-14-0	Phosphorus	1.10E-04	6.60E-02	3,600	8.32E-03
123-38-6	Propanal	5.20E-05	3.12E-02	3,600	3.93E-03
103-65-1	Propylbenzene	4.60E-06	2.76E-03	3,600	3.48E-04
115-07-1	Propylene	4.90E-05	2.94E-02	3,600	3.70E-03
129-00-0	Pyrene	2.25E-06	1.35E-03	3,600	1.70E-04
110-86-1	Pyridine	8.11E-07	4.87E-04	3,600	6.13E-05
7782-49-2	Selenium	1.60E-06	9.60E-04	3,600	1.21E-04
7440-22-4	Silver	1.20E-06	7.20E-04	3,600	9.07E-05
100-42-5	Styrene	1.30E-06	7.80E-04	3,600	9.83E-05
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	1.38E-09	3,600	1.74E-10
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	2.40E-08	3,600	3.02E-09
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	3.29E-04	3,600	4.14E-05
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	2.52E-04	3,600	3.18E-05
127-18-4	Tetrachloroethene	2.50E-06	1.50E-03	3,600	1.89E-04
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	4.27E-04	3,600	5.38E-05
109-99-9	Tetrahydrofuran	9.00E-07	5.40E-04	3,600	6.80E-05
108-88-3	Toluene	2.80E-05	1.68E-02	3,600	2.12E-03
95-53-4	Toluidine, o-	7.01E-06	4.21E-03	3,600	5.30E-04
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	3.88E-04	3,600	4.88E-05
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	1.62E-04	3,600	2.04E-05
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	4.38E-04	3,600	5.52E-05
79-01-6	Trichloroethene	9.40E-07	5.64E-04	3,600	7.11E-05
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	8.52E-04	3,600	1.07E-04
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	7.86E-04	3,600	9.90E-05
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	2.52E-04	3,600	3.18E-05
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	1.50E-02	3,600	1.89E-03
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	1.14E-02	3,600	1.44E-03
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	4.92E-03	3,600	6.20E-04
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	3.29E-04	3,600	4.14E-05
1120-21-4	Undecane	1.20E-05	7.20E-03	3,600	9.07E-04
75-01-4	Vinyl Chloride	7.60E-06	4.56E-03	3,600	5.75E-04
95-47-6	Xylene, o-	1.30E-05	7.80E-03	3,600	9.83E-04
7440-66-6	Zinc	5.60E-05	3.36E-02	3,600	4.23E-03
3268-87-9	OCDD	3.70E-11	2.22E-08	3,600	2.80E-09
39001-02-0	OCDF	5.30E-10	3.18E-07	3,600	4.01E-08
108-38-3	Xylene, m-	1.10E-05	6.60E-03	3,600	8.32E-04
106-42-3	Xylene, p-	1.10E-05	6.60E-03	3,600	8.32E-04
108-39-4	Methylphenol, 3-	1.29E-07	7.71E-05	3,600	9.71E-06
106-44-5	Methylphenol, 4-	1.29E-07	7.71E-05	3,600	9.71E-06
529-20-4	Tolualdehyde, o-	4.00E-05	2.40E-02	3,600	3.02E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_A**
lbs/event	**4,500**
lbs/hour	**4,500**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	2.47E-03	3,600	3.11E-04
208-96-8	Acenaphthylene	3.08E-06	1.39E-02	3,600	1.75E-03
75-07-0	Acetaldehyde	9.30E-05	4.19E-01	3,600	5.27E-02
67-64-1	Acetone	2.40E-05	1.08E-01	3,600	1.36E-02
75-05-8	Acetonitrile	1.90E-05	8.55E-02	3,600	1.08E-02
98-86-2	Acetophenone	2.68E-06	1.21E-02	3,600	1.52E-03
107-13-1	Acrylonitrile	1.60E-05	7.20E-02	3,600	9.07E-03
100-44-7	alpha-Chlorotoluene	5.70E-07	2.57E-03	3,600	3.23E-04
7429-90-5	Aluminum	4.00E-02	1.80E+02	3,600	2.27E+01
92-67-1	Aminobiphenyl, 4-	1.10E-05	4.95E-02	3,600	6.24E-03
62-53-3	Aniline	8.00E-06	3.60E-02	3,600	4.54E-03
120-12-7	Anthracene	1.30E-07	5.85E-04	3,600	7.37E-05
7440-36-0	Antimony	2.90E-05	1.31E-01	3,600	1.64E-02
7440-38-2	Arsenic	5.50E-07	2.48E-03	3,600	3.12E-04
7440-39-3	Barium	3.90E-07	1.76E-03	3,600	2.21E-04
100-52-7	Benzaldehyde	3.80E-05	1.71E-01	3,600	2.15E-02
71-43-2	Benzene	1.20E-04	5.40E-01	3,600	6.80E-02
56-55-3	Benzo(a)anthracene	5.86E-07	2.64E-03	3,600	3.32E-04
50-32-8	Benzo(a)pyrene	7.69E-08	3.46E-04	3,600	4.36E-05
205-99-2	Benzo(b)fluoranthene	1.15E-06	5.18E-03	3,600	6.52E-04
191-24-2	Benzo(ghi)perylene	4.55E-07	2.05E-03	3,600	2.58E-04
207-08-9	Benzo(k)fluoranthene	1.15E-06	5.18E-03	3,600	6.52E-04
65-85-0	Benzoic acid	6.24E-05	2.81E-01	3,600	3.54E-02
100-51-6	Benzyl alcohol	7.77E-07	3.50E-03	3,600	4.41E-04
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	2.47E-03	3,600	3.11E-04
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	2.76E-03	3,600	3.48E-04
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	5.27E-03	3,600	6.63E-04
75-27-4	Bromodichloro methane	7.80E-07	3.51E-03	3,600	4.42E-04
75-25-2	Bromoform	1.30E-06	5.85E-03	3,600	7.37E-04
74-83-9	Bromomethane	1.20E-07	5.40E-04	3,600	6.80E-05
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	2.47E-03	3,600	3.11E-04
78-93-3	Butanone (MEK), 2-	3.90E-06	1.76E-02	3,600	2.21E-03
106-98-9	Butene, 1-	2.20E-05	9.90E-02	3,600	1.25E-02
590-18-1	Butene, cis-2-	1.70E-06	7.65E-03	3,600	9.64E-04
624-64-6	butene, trans-2-	7.70E-06	3.47E-02	3,600	4.37E-03
85-68-7	Butyl benzyl phthalate	1.50E-07	6.75E-04	3,600	8.51E-05
7440-43-9	Cadmium	4.70E-08	2.12E-04	3,600	2.66E-05
86-74-8	Carbazole	7.01E-07	3.15E-03	3,600	3.97E-04
75-15-0	Carbon Disulfide	9.80E-06	4.41E-02	3,600	5.56E-03
56-23-5	Carbon Tetrachloride	1.50E-05	6.75E-02	3,600	8.51E-03
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	3.06E-03	3,600	3.85E-04
107-14-2	Chloroacetonitrile	1.10E-06	4.95E-03	3,600	6.24E-04
106-47-8	Chloroaniline, 4-	1.55E-07	6.98E-04	3,600	8.79E-05
108-90-7	Chlorobenzene	2.50E-06	1.13E-02	3,600	1.42E-03
75-00-3	Chloroethane	4.40E-07	1.98E-03	3,600	2.49E-04
67-66-3	Chloroform	6.10E-06	2.75E-02	3,600	3.46E-03
74-87-3	Chloromethane	1.40E-05	6.30E-02	3,600	7.94E-03
90-13-1	Chloronaphthalene, 1-	5.48E-07	2.47E-03	3,600	3.11E-04
91-58-7	Chloronaphthalene, 2-	5.48E-07	2.47E-03	3,600	3.11E-04
95-57-8	Chlorophenol, 2-	1.92E-06	8.64E-03	3,600	1.09E-03
7440-47-3	Chromium (III)	1.10E-05	4.95E-02	3,600	6.24E-03
18540-29-9	Chromium (VI)	9.00E-06	4.05E-02	3,600	5.10E-03
218-01-9	Chrysene	7.23E-07	3.25E-03	3,600	4.10E-04
7782-50-5	Cl2	1.18E-02	5.31E+01	3,600	6.69E+00
7440-48-4	Cobalt	1.20E-07	5.40E-04	3,600	6.80E-05

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_A**
lbs/event	**4,500**
lbs/hour	**4,500**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	1.13E-01	3,600	1.42E-02
4170-30-3	Crotonaldehyde	3.20E-06	1.44E-02	3,600	1.81E-03
98-82-8	Cumene	4.20E-07	1.89E-03	3,600	2.38E-04
110-82-7	Cyclohexane	2.50E-06	1.13E-02	3,600	1.42E-03
53-70-3	Dibenz(a,h)anthracene	1.02E-07	4.59E-04	3,600	5.78E-05
132-64-9	Dibenzofuran	5.48E-07	2.47E-03	3,600	3.11E-04
124-48-1	Dibromochloromethane	8.80E-07	3.96E-03	3,600	4.99E-04
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	4.01E-03	3,600	5.05E-04
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	2.52E-03	3,600	3.17E-04
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	2.81E-03	3,600	3.54E-04
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	2.61E-03	3,600	3.29E-04
75-34-3	Dichloroethane, 1,1-	3.20E-07	1.44E-03	3,600	1.81E-04
107-06-2	Dichloroethane, 1,2-	5.40E-07	2.43E-03	3,600	3.06E-04
75-35-4	Dichloroethene, 1,1-	4.30E-07	1.94E-03	3,600	2.44E-04
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	5.40E-04	3,600	6.80E-05
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	3.24E-03	3,600	4.08E-04
120-83-2	Dichlorophenol, 2,4-	9.26E-07	4.17E-03	3,600	5.25E-04
87-65-0	Dichlorophenol, 2,6-	5.48E-07	2.47E-03	3,600	3.11E-04
78-87-5	Dichloropropane, 1,2-	3.70E-07	1.67E-03	3,600	2.10E-04
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	5.85E-03	3,600	7.37E-04
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	2.75E-03	3,600	3.46E-04
84-66-2	Diethyl phthalate	8.00E-07	3.60E-03	3,600	4.54E-04
105-05-5	Diethylbenzene, 1,4-	6.70E-07	3.02E-03	3,600	3.80E-04
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	3.11E-02	3,600	3.91E-03
131-11-3	Dimethyl phthalate	5.48E-07	2.47E-03	3,600	3.11E-04
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	2.47E-03	3,600	3.11E-04
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	1.22E-01	3,600	1.53E-02
75-83-2	Dimethylbutane, 2,2-	1.40E-06	6.30E-03	3,600	7.94E-04
79-29-8	Dimethylbutane, 2,3-	3.50E-06	1.58E-02	3,600	1.98E-03
565-59-3	Dimethylpentane, 2,3-	1.40E-05	6.30E-02	3,600	7.94E-03
108-08-7	Dimethylpentane, 2,4-	5.20E-06	2.34E-02	3,600	2.95E-03
84-74-2	Di-n-butyl phthalate	1.10E-05	4.95E-02	3,600	6.24E-03
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	4.29E-02	3,600	5.40E-03
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	2.57E-03	3,600	3.23E-04
51-28-5	Dinitrophenol, 2,4-	2.41E-05	1.08E-01	3,600	1.37E-02
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	2.47E-03	3,600	3.11E-04
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	2.53E-03	3,600	3.19E-04
117-84-0	Di-n-octyl phthalate	3.70E-06	1.67E-02	3,600	2.10E-03
123-91-1	Dioxane, 1,4-	6.40E-07	2.88E-03	3,600	3.63E-04
122-39-4	Diphenylamine	5.48E-07	2.47E-03	3,600	3.11E-04
100-41-4	Ethyl Benzene	1.10E-05	4.95E-02	3,600	6.24E-03
60-29-7	Ethyl Ether	2.50E-06	1.13E-02	3,600	1.42E-03
97-63-2	Ethyl Methacrylate	1.60E-06	7.20E-03	3,600	9.07E-04
611-14-3	Ethyltoluene, 2-	4.50E-07	2.03E-03	3,600	2.55E-04
620-14-4	Ethyltoluene, 3-	4.80E-06	2.16E-02	3,600	2.72E-03
622-96-8	Ethyltoluene, 4-	5.30E-06	2.39E-02	3,600	3.01E-03
206-44-0	Fluoranthene	2.63E-06	1.18E-02	3,600	1.49E-03
86-73-7	Fluorene	6.53E-07	2.94E-03	3,600	3.70E-04
50-00-0	Formaldehyde	4.70E-05	2.12E-01	3,600	2.66E-02
7647-01-0	HCl	1.78E-02	8.01E+01	3,600	1.01E+01
118-74-1	Hexachlorobenzene	4.66E-06	2.10E-02	3,600	2.64E-03
87-68-3	Hexachlorobutadiene	8.11E-07	3.65E-03	3,600	4.60E-04
77-47-4	Hexachlorocyclopentadiene	1.10E-05	4.95E-02	3,600	6.24E-03
67-72-1	Hexachloroethane	5.91E-07	2.66E-03	3,600	3.35E-04
1888-71-7	Hexachloropropene	7.89E-07	3.55E-03	3,600	4.47E-04

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_A**
lbs/event	**4,500**
lbs/hour	**4,500**

Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	4.41E-02	3,600	5.56E-03
591-78-6	Hexanone, 2-	2.00E-06	9.00E-03	3,600	1.13E-03
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	1.31E-07	3,600	1.64E-08
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	3.29E-06	3,600	4.14E-07
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	8.55E-07	3,600	1.08E-07
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	1.58E-08	3,600	1.98E-09
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	4.01E-08	3,600	5.05E-09
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	2.75E-08	3,600	3.46E-09
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	1.17E-06	3,600	1.47E-07
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	7.20E-07	3,600	9.07E-08
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	5.40E-07	3,600	6.80E-08
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	8.55E-07	3,600	1.08E-07
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	1.79E-03	3,600	2.26E-04
78-59-1	Isophorone	5.48E-07	2.47E-03	3,600	3.11E-04
7439-92-1	Lead	4.10E-05	1.85E-01	3,600	2.32E-02
7439-96-5	Manganese	9.40E-05	4.23E-01	3,600	5.33E-02
7439-97-6	Mercury	7.40E-08	3.33E-04	3,600	4.20E-05
126-98-7	Methacrylonitrile	5.90E-06	2.66E-02	3,600	3.35E-03
80-62-6	Methyl Methacrylate	1.60E-06	7.20E-03	3,600	9.07E-04
1634-04-4	Methyl tert-butyl ether	1.30E-05	5.85E-02	3,600	7.37E-03
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	3.69E-03	3,600	4.65E-04
108-87-2	Methylcyclohexane	1.20E-05	5.40E-02	3,600	6.80E-03
75-09-2	Methylene Chloride	2.40E-04	1.08E+00	3,600	1.36E-01
540-84-1	Methylheptane, 2-	2.40E-05	1.08E-01	3,600	1.36E-02
589-81-1	Methylheptane, 3-	3.50E-06	1.58E-02	3,600	1.98E-03
591-76-4	Methylhexane, 2-	1.70E-05	7.65E-02	3,600	9.64E-03
589-34-4	Methylhexane, 3-	2.20E-05	9.90E-02	3,600	1.25E-02
91-57-6	Methylnaphthalene, 2-	7.47E-06	3.36E-02	3,600	4.24E-03
107-83-5	Methylpentane, 2-	1.10E-05	4.95E-02	3,600	6.24E-03
96-14-0	Methylpentane, 3-	7.10E-06	3.20E-02	3,600	4.03E-03
95-48-7	Methylphenol, 2-	3.29E-06	1.48E-02	3,600	1.87E-03
91-20-3	Naphthalene	9.16E-05	4.12E-01	3,600	5.19E-02
134-32-7	Naphthylamine, 1-	1.10E-05	4.95E-02	3,600	6.24E-03
91-59-8	Naphthylamine, 2-	1.10E-05	4.95E-02	3,600	6.24E-03
7440-02-0	Nickel	5.80E-05	2.61E-01	3,600	3.29E-02
88-74-4	Nitroaniline, 2-	5.48E-07	2.47E-03	3,600	3.11E-04
99-09-2	Nitroaniline, 3-	2.19E-06	9.86E-03	3,600	1.24E-03
100-01-6	Nitroaniline, 4-	2.19E-06	9.86E-03	3,600	1.24E-03
98-95-3	Nitrobenzene	6.24E-07	2.81E-03	3,600	3.54E-04
88-75-5	Nitrophenol, 2-	4.71E-06	2.12E-02	3,600	2.67E-03
100-02-7	Nitrophenol, 4-	3.61E-06	1.62E-02	3,600	2.05E-03
55-18-5	N-Nitrosodiethylamine	5.48E-07	2.47E-03	3,600	3.11E-04
62-75-9	N-Nitrosodimethylamine	5.58E-07	2.51E-03	3,600	3.16E-04
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	2.47E-03	3,600	3.11E-04
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	2.47E-03	3,600	3.11E-04
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	4.39E-04	3,600	5.53E-05
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	4.09E-03	3,600	5.15E-04
59-89-2	N-Nitrosomorpholine	5.48E-07	2.47E-03	3,600	3.11E-04
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	3.02E-08	3,600	3.80E-09
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	3.60E-07	3,600	4.54E-08
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	7.20E-07	3,600	9.07E-08
608-93-5	Pentachlorobenzene	5.48E-07	2.47E-03	3,600	3.11E-04
76-01-7	Pentachloroethane	6.98E-07	3.14E-03	3,600	3.96E-04
82-68-8	Pentachloronitrobenzene	5.81E-07	2.61E-03	3,600	3.29E-04
87-86-5	Pentachlorophenol	2.74E-05	1.23E-01	3,600	1.55E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_A**
lbs/event	**4,500**
lbs/hour	**4,500**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	2.21E-03	3,600	2.78E-04
85-01-8	Phenanthrene	3.17E-06	1.43E-02	3,600	1.80E-03
108-95-2	Phenol	2.98E-06	1.34E-02	3,600	1.69E-03
7723-14-0	Phosphorus	1.10E-04	4.95E-01	3,600	6.24E-02
123-38-6	Propanal	5.20E-05	2.34E-01	3,600	2.95E-02
103-65-1	Propylbenzene	4.60E-06	2.07E-02	3,600	2.61E-03
115-07-1	Propylene	4.90E-05	2.21E-01	3,600	2.78E-02
129-00-0	Pyrene	2.25E-06	1.01E-02	3,600	1.28E-03
110-86-1	Pyridine	8.11E-07	3.65E-03	3,600	4.60E-04
7782-49-2	Selenium	1.60E-06	7.20E-03	3,600	9.07E-04
7440-22-4	Silver	1.20E-06	5.40E-03	3,600	6.80E-04
100-42-5	Styrene	1.30E-06	5.85E-03	3,600	7.37E-04
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	1.04E-08	3,600	1.30E-09
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	1.80E-07	3,600	2.27E-08
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	2.47E-03	3,600	3.11E-04
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	1.89E-03	3,600	2.38E-04
127-18-4	Tetrachloroethene	2.50E-06	1.13E-02	3,600	1.42E-03
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	3.20E-03	3,600	4.04E-04
109-99-9	Tetrahydrofuran	9.00E-07	4.05E-03	3,600	5.10E-04
108-88-3	Toluene	2.80E-05	1.26E-01	3,600	1.59E-02
95-53-4	Toluidine, o-	7.01E-06	3.15E-02	3,600	3.97E-03
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	2.91E-03	3,600	3.66E-04
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	1.22E-03	3,600	1.53E-04
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	3.29E-03	3,600	4.14E-04
79-01-6	Trichloroethene	9.40E-07	4.23E-03	3,600	5.33E-04
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	6.39E-03	3,600	8.05E-04
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	5.90E-03	3,600	7.43E-04
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	1.89E-03	3,600	2.38E-04
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	1.13E-01	3,600	1.42E-02
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	8.55E-02	3,600	1.08E-02
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	3.69E-02	3,600	4.65E-03
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	2.47E-03	3,600	3.11E-04
1120-21-4	Undecane	1.20E-05	5.40E-02	3,600	6.80E-03
75-01-4	Vinyl Chloride	7.60E-06	3.42E-02	3,600	4.31E-03
95-47-6	Xylene, o-	1.30E-05	5.85E-02	3,600	7.37E-03
7440-66-6	Zinc	5.60E-05	2.52E-01	3,600	3.18E-02
3268-87-9	OCDD	3.70E-11	1.67E-07	3,600	2.10E-08
39001-02-0	OCDF	5.30E-10	2.39E-06	3,600	3.01E-07
108-38-3	Xylene, m-	1.10E-05	4.95E-02	3,600	6.24E-03
106-42-3	Xylene, p-	1.10E-05	4.95E-02	3,600	6.24E-03
108-39-4	Methylphenol, 3-	1.29E-07	5.78E-04	3,600	7.29E-05
106-44-5	Methylphenol, 4-	1.29E-07	5.78E-04	3,600	7.29E-05
529-20-4	Tolualdehyde, o-	4.00E-05	1.80E-01	3,600	2.27E-02

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_B**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
83-32-9	Acenaphthene	5.48E-07	3.29E-04	3,600	4.14E-05
208-96-8	Acenaphthylene	3.08E-06	1.85E-03	3,600	2.33E-04
75-07-0	Acetaldehyde	9.30E-05	5.58E-02	3,600	7.03E-03
67-64-1	Acetone	2.40E-05	1.44E-02	3,600	1.81E-03
75-05-8	Acetonitrile	1.90E-05	1.14E-02	3,600	1.44E-03
98-86-2	Acetophenone	2.68E-06	1.61E-03	3,600	2.03E-04
107-13-1	Acrylonitrile	1.60E-05	9.60E-03	3,600	1.21E-03
100-44-7	alpha-Chlorotoluene	5.70E-07	3.42E-04	3,600	4.31E-05
7429-90-5	Aluminum	4.00E-02	2.40E+01	3,600	3.02E+00
92-67-1	Aminobiphenyl, 4-	1.10E-05	6.60E-03	3,600	8.32E-04
62-53-3	Aniline	8.00E-06	4.80E-03	3,600	6.05E-04
120-12-7	Anthracene	1.30E-07	7.80E-05	3,600	9.83E-06
7440-36-0	Antimony	2.90E-05	1.74E-02	3,600	2.19E-03
7440-38-2	Arsenic	5.50E-07	3.30E-04	3,600	4.16E-05
7440-39-3	Barium	3.90E-07	2.34E-04	3,600	2.95E-05
100-52-7	Benzaldehyde	3.80E-05	2.28E-02	3,600	2.87E-03
71-43-2	Benzene	1.20E-04	7.20E-02	3,600	9.07E-03
56-55-3	Benzo(a)anthracene	5.86E-07	3.52E-04	3,600	4.43E-05
50-32-8	Benzo(a)pyrene	7.69E-08	4.61E-05	3,600	5.81E-06
205-99-2	Benzo(b)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
191-24-2	Benzo(ghi)perylene	4.55E-07	2.73E-04	3,600	3.44E-05
207-08-9	Benzo(k)fluoranthene	1.15E-06	6.90E-04	3,600	8.69E-05
65-85-0	Benzoic acid	6.24E-05	3.74E-02	3,600	4.72E-03
100-51-6	Benzyl alcohol	7.77E-07	4.66E-04	3,600	5.87E-05
111-91-1	bis(2-Chloroethoxy)methane	5.48E-07	3.29E-04	3,600	4.14E-05
111-44-4	bis(2-Chloroethyl)ether	6.13E-07	3.68E-04	3,600	4.63E-05
117-81-7	bis(2-Ethylhexyl)phthalate	1.17E-06	7.02E-04	3,600	8.85E-05
75-27-4	Bromodichloro methane	7.80E-07	4.68E-04	3,600	5.90E-05
75-25-2	Bromoform	1.30E-06	7.80E-04	3,600	9.83E-05
74-83-9	Bromomethane	1.20E-07	7.20E-05	3,600	9.07E-06
101-55-3	Bromophenyl phenyl ether, 4-	5.48E-07	3.29E-04	3,600	4.14E-05
78-93-3	Butanone (MEK), 2-	3.90E-06	2.34E-03	3,600	2.95E-04
106-98-9	Butene, 1-	2.20E-05	1.32E-02	3,600	1.66E-03
590-18-1	Butene, cis-2-	1.70E-06	1.02E-03	3,600	1.29E-04
624-64-6	butene, trans-2-	7.70E-06	4.62E-03	3,600	5.82E-04
85-68-7	Butyl benzyl phthalate	1.50E-07	9.00E-05	3,600	1.13E-05
7440-43-9	Cadmium	4.70E-08	2.82E-05	3,600	3.55E-06
86-74-8	Carbazole	7.01E-07	4.21E-04	3,600	5.30E-05
75-15-0	Carbon Disulfide	9.80E-06	5.88E-03	3,600	7.41E-04
56-23-5	Carbon Tetrachloride	1.50E-05	9.00E-03	3,600	1.13E-03
59-50-7	Chloro-3-methylphenol, 4-	6.79E-07	4.07E-04	3,600	5.13E-05
107-14-2	Chloroacetonitrile	1.10E-06	6.60E-04	3,600	8.32E-05
106-47-8	Chloroaniline, 4-	1.55E-07	9.30E-05	3,600	1.17E-05
108-90-7	Chlorobenzene	2.50E-06	1.50E-03	3,600	1.89E-04
75-00-3	Chloroethane	4.40E-07	2.64E-04	3,600	3.33E-05
67-66-3	Chloroform	6.10E-06	3.66E-03	3,600	4.61E-04
74-87-3	Chloromethane	1.40E-05	8.40E-03	3,600	1.06E-03
90-13-1	Chloronaphthalene, 1-	5.48E-07	3.29E-04	3,600	4.14E-05
91-58-7	Chloronaphthalene, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
95-57-8	Chlorophenol, 2-	1.92E-06	1.15E-03	3,600	1.45E-04
7440-47-3	Chromium (III)	1.10E-05	6.60E-03	3,600	8.32E-04
18540-29-9	Chromium (VI)	9.00E-06	5.40E-03	3,600	6.80E-04
218-01-9	Chrysene	7.23E-07	4.34E-04	3,600	5.47E-05
7782-50-5	Cl2	1.18E-02	7.08E+00	3,600	8.92E-01
7440-48-4	Cobalt	1.20E-07	7.20E-05	3,600	9.07E-06

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_B**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
7440-50-8	Copper	2.50E-05	1.50E-02	3,600	1.89E-03
4170-30-3	Crotonaldehyde	3.20E-06	1.92E-03	3,600	2.42E-04
98-82-8	Cumene	4.20E-07	2.52E-04	3,600	3.18E-05
110-82-7	Cyclohexane	2.50E-06	1.50E-03	3,600	1.89E-04
53-70-3	Dibenz(a,h)anthracene	1.02E-07	6.12E-05	3,600	7.71E-06
132-64-9	Dibenzofuran	5.48E-07	3.29E-04	3,600	4.14E-05
124-48-1	Dibromochloromethane	8.80E-07	5.28E-04	3,600	6.65E-05
106-93-4	Dibromoethane (EDB), 1,2-	8.90E-07	5.34E-04	3,600	6.73E-05
95-50-1	Dichlorobenzene, 1,2-	5.59E-07	3.35E-04	3,600	4.23E-05
541-73-1	Dichlorobenzene, 1,3-	6.24E-07	3.74E-04	3,600	4.72E-05
106-46-7	Dichlorobenzene, 1,4-	5.81E-07	3.49E-04	3,600	4.39E-05
75-34-3	Dichloroethane, 1,1-	3.20E-07	1.92E-04	3,600	2.42E-05
107-06-2	Dichloroethane, 1,2-	5.40E-07	3.24E-04	3,600	4.08E-05
75-35-4	Dichloroethene, 1,1-	4.30E-07	2.58E-04	3,600	3.25E-05
156-59-2	Dichloroethene, cis-1,2-	1.20E-07	7.20E-05	3,600	9.07E-06
156-60-5	Dichloroethene, trans-1,2-	7.20E-07	4.32E-04	3,600	5.44E-05
120-83-2	Dichlorophenol, 2,4-	9.26E-07	5.56E-04	3,600	7.00E-05
87-65-0	Dichlorophenol, 2,6-	5.48E-07	3.29E-04	3,600	4.14E-05
78-87-5	Dichloropropane, 1,2-	3.70E-07	2.22E-04	3,600	2.80E-05
10062-01-5	Dichloropropene, cis-1,3-	1.30E-06	7.80E-04	3,600	9.83E-05
10061-02-6	Dichloropropene, trans-1,3-	6.10E-07	3.66E-04	3,600	4.61E-05
84-66-2	Diethyl phthalate	8.00E-07	4.80E-04	3,600	6.05E-05
105-05-5	Diethylbenzene, 1,4-	6.70E-07	4.02E-04	3,600	5.07E-05
105-67-9	Dimethyl phenol, 2,4-	6.90E-06	4.14E-03	3,600	5.22E-04
131-11-3	Dimethyl phthalate	5.48E-07	3.29E-04	3,600	4.14E-05
60-11-7	Dimethylaminoazobenzene, p-	5.48E-07	3.29E-04	3,600	4.14E-05
5779-94-2	Dimethylbenzaldehyde, 2,5-	2.70E-05	1.62E-02	3,600	2.04E-03
75-83-2	Dimethylbutane, 2,2-	1.40E-06	8.40E-04	3,600	1.06E-04
79-29-8	Dimethylbutane, 2,3-	3.50E-06	2.10E-03	3,600	2.65E-04
565-59-3	Dimethylpentane, 2,3-	1.40E-05	8.40E-03	3,600	1.06E-03
108-08-7	Dimethylpentane, 2,4-	5.20E-06	3.12E-03	3,600	3.93E-04
84-74-2	Di-n-butyl phthalate	1.10E-05	6.60E-03	3,600	8.32E-04
534-52-1	Dinitro-2-methylphenol, 4,6-	9.53E-06	5.72E-03	3,600	7.20E-04
99-65-0	Dinitrobenzene, 1,3-	5.70E-07	3.42E-04	3,600	4.31E-05
51-28-5	Dinitrophenol, 2,4-	2.41E-05	1.45E-02	3,600	1.82E-03
121-14-2	Dinitrotoluene, 2,4-	5.48E-07	3.29E-04	3,600	4.14E-05
606-20-2	Dinitrotoluene, 2,6-	5.63E-07	3.38E-04	3,600	4.26E-05
117-84-0	Di-n-octyl phthalate	3.70E-06	2.22E-03	3,600	2.80E-04
123-91-1	Dioxane, 1,4-	6.40E-07	3.84E-04	3,600	4.84E-05
122-39-4	Diphenylamine	5.48E-07	3.29E-04	3,600	4.14E-05
100-41-4	Ethyl Benzene	1.10E-05	6.60E-03	3,600	8.32E-04
60-29-7	Ethyl Ether	2.50E-06	1.50E-03	3,600	1.89E-04
97-63-2	Ethyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
611-14-3	Ethyltoluene, 2-	4.50E-07	2.70E-04	3,600	3.40E-05
620-14-4	Ethyltoluene, 3-	4.80E-06	2.88E-03	3,600	3.63E-04
622-96-8	Ethyltoluene, 4-	5.30E-06	3.18E-03	3,600	4.01E-04
206-44-0	Fluoranthene	2.63E-06	1.58E-03	3,600	1.99E-04
86-73-7	Fluorene	6.53E-07	3.92E-04	3,600	4.94E-05
50-00-0	Formaldehyde	4.70E-05	2.82E-02	3,600	3.55E-03
7647-01-0	HCl	1.78E-02	1.07E+01	3,600	1.35E+00
118-74-1	Hexachlorobenzene	4.66E-06	2.80E-03	3,600	3.52E-04
87-68-3	Hexachlorobutadiene	8.11E-07	4.87E-04	3,600	6.13E-05
77-47-4	Hexachlorocyclopentadiene	1.10E-05	6.60E-03	3,600	8.32E-04
67-72-1	Hexachloroethane	5.91E-07	3.55E-04	3,600	4.47E-05
1888-71-7	Hexachloropropene	7.89E-07	4.73E-04	3,600	5.96E-05

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_B**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
110-54-3	Hexane	9.80E-06	5.88E-03	3,600	7.41E-04
591-78-6	Hexanone, 2-	2.00E-06	1.20E-03	3,600	1.51E-04
35822-46-9	HpCDD, 1,2,3,4,6,7,8-	2.90E-11	1.74E-08	3,600	2.19E-09
67562-39-4	HpCDF, 1,2,3,4,6,7,8-	7.30E-10	4.38E-07	3,600	5.52E-08
55673-89-7	HpCDF, 1,2,3,4,7,8,9-	1.90E-10	1.14E-07	3,600	1.44E-08
39227-28-6	HxCDD, 1,2,3,4,7,8-	3.50E-12	2.10E-09	3,600	2.65E-10
57653-85-7	HxCDD, 1,2,3,6,7,8-	8.90E-12	5.34E-09	3,600	6.73E-10
19408-74-3	HxCDD, 1,2,3,7,8,9-	6.10E-12	3.66E-09	3,600	4.61E-10
70648-26-9	HxCDF, 1,2,3,4,7,8-	2.60E-10	1.56E-07	3,600	1.97E-08
57117-44-9	HxCDF, 1,2,3,6,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
72918-21-9	HxCDF, 1,2,3,7,8,9-	1.20E-10	7.20E-08	3,600	9.07E-09
60851-34-5	HxCDF, 2,3,4,6,7,8-	1.90E-10	1.14E-07	3,600	1.44E-08
193-39-5	Indeno(1,2,3-cd)pyrene	3.98E-07	2.39E-04	3,600	3.01E-05
78-59-1	Isophorone	5.48E-07	3.29E-04	3,600	4.14E-05
7439-92-1	Lead	4.10E-05	2.46E-02	3,600	3.10E-03
7439-96-5	Manganese	9.40E-05	5.64E-02	3,600	7.11E-03
7439-97-6	Mercury	7.40E-08	4.44E-05	3,600	5.59E-06
126-98-7	Methacrylonitrile	5.90E-06	3.54E-03	3,600	4.46E-04
80-62-6	Methyl Methacrylate	1.60E-06	9.60E-04	3,600	1.21E-04
1634-04-4	Methyl tert-butyl ether	1.30E-05	7.80E-03	3,600	9.83E-04
108-10-1	Methyl-2-pentanone, 4-	8.20E-07	4.92E-04	3,600	6.20E-05
108-87-2	Methylcyclohexane	1.20E-05	7.20E-03	3,600	9.07E-04
75-09-2	Methylene Chloride	2.40E-04	1.44E-01	3,600	1.81E-02
540-84-1	Methylheptane, 2-	2.40E-05	1.44E-02	3,600	1.81E-03
589-81-1	Methylheptane, 3-	3.50E-06	2.10E-03	3,600	2.65E-04
591-76-4	Methylhexane, 2-	1.70E-05	1.02E-02	3,600	1.29E-03
589-34-4	Methylhexane, 3-	2.20E-05	1.32E-02	3,600	1.66E-03
91-57-6	Methylnaphthalene, 2-	7.47E-06	4.48E-03	3,600	5.65E-04
107-83-5	Methylpentane, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
96-14-0	Methylpentane, 3-	7.10E-06	4.26E-03	3,600	5.37E-04
95-48-7	Methylphenol, 2-	3.29E-06	1.97E-03	3,600	2.49E-04
91-20-3	Naphthalene	9.16E-05	5.50E-02	3,600	6.92E-03
134-32-7	Naphthylamine, 1-	1.10E-05	6.60E-03	3,600	8.32E-04
91-59-8	Naphthylamine, 2-	1.10E-05	6.60E-03	3,600	8.32E-04
7440-02-0	Nickel	5.80E-05	3.48E-02	3,600	4.38E-03
88-74-4	Nitroaniline, 2-	5.48E-07	3.29E-04	3,600	4.14E-05
99-09-2	Nitroaniline, 3-	2.19E-06	1.31E-03	3,600	1.66E-04
100-01-6	Nitroaniline, 4-	2.19E-06	1.31E-03	3,600	1.66E-04
98-95-3	Nitrobenzene	6.24E-07	3.74E-04	3,600	4.72E-05
88-75-5	Nitrophenol, 2-	4.71E-06	2.83E-03	3,600	3.56E-04
100-02-7	Nitrophenol, 4-	3.61E-06	2.17E-03	3,600	2.73E-04
55-18-5	N-Nitrosodiethylamine	5.48E-07	3.29E-04	3,600	4.14E-05
62-75-9	N-Nitrosodimethylamine	5.58E-07	3.35E-04	3,600	4.22E-05
924-16-3	N-Nitrosodi-n-butylamine	5.48E-07	3.29E-04	3,600	4.14E-05
621-64-7	N-Nitrosodi-n-propylamine	5.48E-07	3.29E-04	3,600	4.14E-05
86-30-6	N-Nitrosodiphenyl amine	9.75E-08	5.85E-05	3,600	7.37E-06
10595-95-6	N-Nitrosomethylethyl amine	9.09E-07	5.45E-04	3,600	6.87E-05
59-89-2	N-Nitrosomorpholine	5.48E-07	3.29E-04	3,600	4.14E-05
40321-76-4	PeCDD, 1,2,3,7,8-	6.70E-12	4.02E-09	3,600	5.07E-10
57117-41-6	PeCDF, 1,2,3,7,8-	8.00E-11	4.80E-08	3,600	6.05E-09
57117-31-4	PeCDF, 2,3,4,7,8-	1.60E-10	9.60E-08	3,600	1.21E-08
608-93-5	Pentachlorobenzene	5.48E-07	3.29E-04	3,600	4.14E-05
76-01-7	Pentachloroethane	6.98E-07	4.19E-04	3,600	5.28E-05
82-68-8	Pentachloronitrobenzene	5.81E-07	3.49E-04	3,600	4.39E-05
87-86-5	Pentachlorophenol	2.74E-05	1.64E-02	3,600	2.07E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	**M225_B**
lbs/event	**600**
lbs/hour	**600**
	Calculated Emission Rate

CAS	Name	Emission Factor	(indiv chem lbs/hr)	seconds per hour	Cont (g/s)
14797-73-0	Perchlorate	4.90E-07	2.94E-04	3,600	3.70E-05
85-01-8	Phenanthrene	3.17E-06	1.90E-03	3,600	2.40E-04
108-95-2	Phenol	2.98E-06	1.79E-03	3,600	2.25E-04
7723-14-0	Phosphorus	1.10E-04	6.60E-02	3,600	8.32E-03
123-38-6	Propanal	5.20E-05	3.12E-02	3,600	3.93E-03
103-65-1	Propylbenzene	4.60E-06	2.76E-03	3,600	3.48E-04
115-07-1	Propylene	4.90E-05	2.94E-02	3,600	3.70E-03
129-00-0	Pyrene	2.25E-06	1.35E-03	3,600	1.70E-04
110-86-1	Pyridine	8.11E-07	4.87E-04	3,600	6.13E-05
7782-49-2	Selenium	1.60E-06	9.60E-04	3,600	1.21E-04
7440-22-4	Silver	1.20E-06	7.20E-04	3,600	9.07E-05
100-42-5	Styrene	1.30E-06	7.80E-04	3,600	9.83E-05
1746-01-6	TCDD, 2,3,7,8-	2.30E-12	1.38E-09	3,600	1.74E-10
51207-31-9	TCDF, 2,3,7,8-	4.00E-11	2.40E-08	3,600	3.02E-09
95-94-3	Tetrachlorobenzene, 1,2,4,5-	5.48E-07	3.29E-04	3,600	4.14E-05
79-34-5	Tetrachloroethane, 1,1,2,2-	4.20E-07	2.52E-04	3,600	3.18E-05
127-18-4	Tetrachloroethene	2.50E-06	1.50E-03	3,600	1.89E-04
58-90-2	Tetrachlorophenol, 2,3,4,6-	7.12E-07	4.27E-04	3,600	5.38E-05
109-99-9	Tetrahydrofuran	9.00E-07	5.40E-04	3,600	6.80E-05
108-88-3	Toluene	2.80E-05	1.68E-02	3,600	2.12E-03
95-53-4	Toluidine, o-	7.01E-06	4.21E-03	3,600	5.30E-04
120-82-1	Trichlorobenzene, 1,2,4-	6.46E-07	3.88E-04	3,600	4.88E-05
71-55-6	Trichloroethane, 1,1,1-	2.70E-07	1.62E-04	3,600	2.04E-05
79-00-5	Trichloroethane, 1,1,2-	7.30E-07	4.38E-04	3,600	5.52E-05
79-01-6	Trichloroethene	9.40E-07	5.64E-04	3,600	7.11E-05
95-95-4	Trichlorophenol, 2,4,5-	1.42E-06	8.52E-04	3,600	1.07E-04
88-06-2	Trichlorophenol, 2,4,6-	1.31E-06	7.86E-04	3,600	9.90E-05
526-73-8	Trimethylbenzene, 1,2,3-	4.20E-07	2.52E-04	3,600	3.18E-05
95-63-6	Trimethylbenzene, 1,2,4-	2.50E-05	1.50E-02	3,600	1.89E-03
108-67-8	Trimethylbenzene, 1,3,5-	1.90E-05	1.14E-02	3,600	1.44E-03
565-75-3	Trimethylpentane, 2,3,4	8.20E-06	4.92E-03	3,600	6.20E-04
99-35-4	Trinitrobenzene, 1,3,5-	5.48E-07	3.29E-04	3,600	4.14E-05
1120-21-4	Undecane	1.20E-05	7.20E-03	3,600	9.07E-04
75-01-4	Vinyl Chloride	7.60E-06	4.56E-03	3,600	5.75E-04
95-47-6	Xylene, o-	1.30E-05	7.80E-03	3,600	9.83E-04
7440-66-6	Zinc	5.60E-05	3.36E-02	3,600	4.23E-03
3268-87-9	OCDD	3.70E-11	2.22E-08	3,600	2.80E-09
39001-02-0	OCDF	5.30E-10	3.18E-07	3,600	4.01E-08
108-38-3	Xylene, m-	1.10E-05	6.60E-03	3,600	8.32E-04
106-42-3	Xylene, p-	1.10E-05	6.60E-03	3,600	8.32E-04
108-39-4	Methylphenol, 3-	1.29E-07	7.71E-05	3,600	9.71E-06
106-44-5	Methylphenol, 4-	1.29E-07	7.71E-05	3,600	9.71E-06
529-20-4	Tolualdehyde, o-	4.00E-05	2.40E-02	3,600	3.02E-03

One-hour emissions for acute exposure
Cont (g/s) =

Scenario	All Sources added together	M-136 A + M225A added together	Fraction M-136 A + M225A
lbs/event	253,300	126,500	0.499407817
lbs/hour	253,300	126,500	0.499407817

Estimation of the Amount of Chromium and Nickel Available for release during burning

AP %	Trash %	% Aluminum in AP	Amount of Cr in Alumium	Units	Amount of Cr in AP Waste	Units	Amount of Ni in Alumium	Units	Amount of Ni in AP Waste	Units
100	0	16	3.1	mg/kg	0.50	mg/kg	29.1	mg/kg	4.7	mg/kg
85	15	16	3.1	mg/kg	0.42	mg/kg	29.1	mg/kg	4.0	mg/kg
65	35	16	3.1	mg/kg	0.32	mg/kg	29.1	mg/kg	3.0	mg/kg

Cr VI Emissions Factor	Units	Source	Unit Correction	Units	Amount of Cr in AP Waste	Units	Nickel Emissions Factor	Units	Amount of Ni in AP Waste	Units
1.30E-05	kg/kg	ATK, 2007: Table 7	1.00E+06	mg/kg	6.4	mg/kg	3.6E-05	kg/kg	167.6	mg/kg
2.00E-05	kg/kg	ATK, 2007: Table 8	1.00E+06	mg/kg	8.4	mg/kg	5.8E-05	kg/kg	229.5	mg/kg
1.60E-05	kg/kg	ATK, 2007: Table 9	1.00E+06	mg/kg	5.2	mg/kg	1.8E-05	kg/kg	54.5	mg/kg

AP %	More Cr than expected by a factor of:	Cr Adjustment Factor
100	13	
85	20	**0.050**
65	16	

AP %	More Ni than expected by a factor of:	Ni Adjustment Factor
100	36.0	
85	58.0	**0.017**
65	18.0	

M-136 A and M-225 A Acute HQ's and HI Summary of Hazard Indices

Table 1. Acute Hazard Indices

Receptor	Summed HI all sources [1]	Summed HI for M-136 A and M-225 A[2]	With adjusted Ni and Cr[3]
Adams Ranch	2.8	1.4	0.4
ATK Ranch Pond	0.2	0.1	2.9E-02
Autoliv	4.3	2.2	0.5
Blue Creek	4.7	2.4	0.6
Boundary 1	5.3	2.7	0.7
Boundary 2	2.3	1.2	0.3
Boundary 3	0.7	0.4	0.1
Boundary 4	0.8	0.4	0.1
Christensen Ranch	0.9	0.4	0.1
Holmgren Ranch	0.5	0.2	0.1
Howell Dairy	0.3	0.1	3.6E-02
North Plant Main Adm	2.0	1.0	0.2
Penrose	0.3	0.1	3.4E-02
South Plant Main Adm	3.8	1.9	0.5
Thatcher	0.3	0.2	4.4E-02
Max Offsite	0.9	0.5	1.2E-01
Max Onsite	7.8	3.9	9.7E-01

[1] The HI presented in this column assume **all sources are active** (worst case, and unrealistic operating conditions) and use the emissions unadjusted for chromium and nickel contributed by the test pans.

[2] These HI are based on using only sources **M136A1, A2, A3 and M225A** (worst case, normal operating conditions) and use the emissions unadjusted for chromium and nickel contributed by the test pans.

[3] These HI are based on using only sources **M136 A1, A2, A3 and M225A** and **adjusted amounts of chromium and nickel**. The adjustment is based on the April 2014 chromium and nickel analytical results from ATK. See Section 10 of the HHRA for more details.

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	3.2E-03	690,000	4.6E-09		1.6E-03	2.3E-09	1.6E-03	2.3E-09
1,2,4-Trimethylbenzene	95-63-6	1.9E-01	690,000	2.8E-07		9.5E-02	1.4E-07	9.5E-02	1.4E-07
1,4-Diethylbenzene	105-05-5	5.1E-03	12,000	4.3E-07		2.6E-03	2.1E-07	2.6E-03	2.1E-07
1-Butene	106-98-9	1.7E-01	1,200,000	1.4E-07		8.4E-02	7.0E-08	8.4E-02	7.0E-08
1-Chloronapthalene	90-13-1	4.2E-03	4,600	9.1E-07		2.1E-03	4.5E-07	2.1E-03	4.5E-07
1-Naphthylamine	134-32-7	8.4E-02	210	4.0E-04		4.2E-02	2.0E-04	4.2E-02	2.0E-04
2,2,4-Trimethylpentane	540-84-1	1.8E-01	14,000,000	1.3E-08		9.1E-02	6.5E-09	9.1E-02	6.5E-09
2,2-Dimethylbutane	75-83-2	1.1E-02	1,800,000	5.9E-09		5.3E-03	3.0E-09	5.3E-03	3.0E-09
2,3,4-Trimethylpentane	565-75-3	6.3E-02	14,000,000	4.5E-09		3.1E-02	2.2E-09	3.1E-02	2.2E-09
2,3-Dimethylbutane	79-29-8	2.7E-02	1,800,000	1.5E-08		1.3E-02	7.4E-09	1.3E-02	7.4E-09
2,3-Dimethylpentane	565-59-3	1.1E-01	1,800,000	5.9E-08		5.3E-02	3.0E-08	5.3E-02	3.0E-08
2,4-Dimethylpentane	108-08-7	4.0E-02	180,000	2.2E-07		2.0E-02	1.1E-07	2.0E-02	1.1E-07
2,5-Dimethylbenzaldehyde	5779-94-2	2.1E-01	17,000	1.2E-05		1.0E-01	6.1E-06	1.0E-01	6.1E-06
2,6-Dichlorophenol	87-65-0	4.2E-03	8,800	4.8E-07		2.1E-03	2.4E-07	2.1E-03	2.4E-07
2-Ethyltoluene	611-14-3	3.4E-03	12,000	2.9E-07		1.7E-03	1.4E-07	1.7E-03	1.4E-07
2-Hexanone	591-78-6	1.5E-02	41,000	3.7E-07		7.6E-03	1.9E-07	7.6E-03	1.9E-07
2-Methylhexane	591-76-4	1.3E-01	1,800,000	7.2E-08		6.5E-02	3.6E-08	6.5E-02	3.6E-08
2-Methylnaphthalene	91-57-6	5.7E-02	3,000	1.9E-05		2.8E-02	9.5E-06	2.8E-02	9.5E-06
2-Methylpentane	107-83-5	8.4E-02	1,800,000	4.7E-08		4.2E-02	2.3E-08	4.2E-02	2.3E-08
2-Naphthylamine	91-59-8	8.4E-02	320	2.6E-04		4.2E-02	1.3E-04	4.2E-02	1.3E-04
3-Ethyltoluene	620-14-4	3.7E-02	12,000	3.1E-06		1.8E-02	1.5E-06	1.8E-02	1.5E-06
3-Methylheptane	589-81-1	2.7E-02	1,400,000	1.9E-08		1.3E-02	9.5E-09	1.3E-02	9.5E-09
3-Methylhexane	589-34-4	1.7E-01	1,800,000	9.3E-08		8.4E-02	4.7E-08	8.4E-02	4.7E-08
3-Methylpentane	96-14-0	5.4E-02	1,800,000	3.0E-08		2.7E-02	1.5E-08	2.7E-02	1.5E-08
4,6-Dinitro-2-methylphenol	534-52-1	7.3E-02	200	3.6E-04		3.6E-02	1.8E-04	3.6E-02	1.8E-04
4-Aminobyphenyl	92-67-1	8.4E-02	490	1.7E-04		4.2E-02	8.5E-05	4.2E-02	8.5E-05
4-Ethyltoluene	622-96-8	4.0E-02	12,000	3.4E-06		2.0E-02	1.7E-06	2.0E-02	1.7E-06
Acenaphthene	83-32-9	4.2E-03	3,600	1.2E-06		2.1E-03	5.8E-07	2.1E-03	5.8E-07
Acenaphthylene	208-96-8	2.4E-02	10,000	2.4E-06		1.2E-02	1.2E-06	1.2E-02	1.2E-06
Acetaldehyde	75-07-0	7.1E-01	470	1.5E-03		3.5E-01	7.5E-04	3.5E-01	7.5E-04
Acetone	67-64-1	1.8E-01	470,000	3.9E-07		9.1E-02	1.9E-07	9.1E-02	1.9E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetonitrile	75-05-8	1.5E-01	22,000	6.6E-06		7.2E-02	3.3E-06	7.2E-02	3.3E-06
Acetophenone	98-86-2	2.0E-02	10,000	2.0E-06		1.0E-02	1.0E-06	1.0E-02	1.0E-06
Acrylonitrile	107-13-1	1.2E-01	10,000	1.2E-05		6.1E-02	6.1E-06	6.1E-02	6.1E-06
Aluminum	7429-90-5	3.0E+02	3,000	1.0E-01		1.5E+02	5.0E-02	1.5E+02	5.0E-02
Aniline	62-53-3	6.1E-02	30,000	2.0E-06		3.0E-02	1.0E-06	3.0E-02	1.0E-06
Anthracene	120-12-7	9.9E-04	270	3.7E-06		5.0E-04	1.8E-06	5.0E-04	1.8E-06
Antimony	7440-36-0	2.2E-01	500	4.4E-04		1.1E-01	2.2E-04	1.1E-01	2.2E-04
Arsenic	7440-38-2	4.1E-03	0.20	2.1E-02		2.1E-03	1.0E-02	2.1E-03	1.0E-02
Barium	7440-39-3	2.9E-03	1,500	1.9E-06		1.5E-03	9.7E-07	1.5E-03	9.7E-07
Benzaldehyde	100-52-7	2.9E-01	17,000	1.7E-05		1.4E-01	8.5E-06	1.4E-01	8.5E-06
Benzene	71-43-2	9.2E-01	27	3.4E-02		4.6E-01	1.7E-02	4.6E-01	1.7E-02
Benzo(a)anthracene	56-55-3	4.5E-03	1,200	3.7E-06		2.2E-03	1.9E-06	2.2E-03	1.9E-06
Benzo(a)pyrene	50-32-8	5.8E-04	600	9.7E-07		2.9E-04	4.9E-07	2.9E-04	4.9E-07
Benzo(b)fluoranthene	205-99-2	8.8E-03	31	2.8E-04		4.4E-03	1.4E-04	4.4E-03	1.4E-04
Benzo(g,h,i)perylene	191-24-2	3.4E-03	30,000	1.1E-07		1.7E-03	5.7E-08	1.7E-03	5.7E-08
Benzo(k)fluoranthene	207-08-9	8.7E-03	19	4.6E-04		4.4E-03	2.3E-04	4.4E-03	2.3E-04
Benzoic acid	65-85-0	4.8E-01	2,800	1.7E-04		2.4E-01	8.5E-05	2.4E-01	8.5E-05
Benzyl alcohol	100-51-6	5.9E-03	130,000	4.6E-08		3.0E-03	2.3E-08	3.0E-03	2.3E-08
Benzyl chloride	100-44-7	4.4E-03	240	1.8E-05		2.2E-03	9.0E-06	2.2E-03	9.0E-06
Bis(2-chlorethyl)ether	111-44-4	4.7E-03	58,000	8.1E-08		2.3E-03	4.0E-08	2.3E-03	4.0E-08
Bis(2-chloroethoxy)methane	111-91-1	4.2E-03	920	4.5E-06		2.1E-03	2.3E-06	2.1E-03	2.3E-06
Bromodichloromethane	75-27-4	6.0E-03	260	2.3E-05		3.0E-03	1.1E-05	3.0E-03	1.1E-05
Bromoform	75-25-2	9.9E-03	15,000	6.6E-07		5.0E-03	3.3E-07	5.0E-03	3.3E-07
Bromophenyl-phenylether, 4-	101-55-3	4.2E-03	290	1.4E-05		2.1E-03	7.2E-06	2.1E-03	7.2E-06
Butylbenzylphthalate	85-68-7	1.1E-03	15,000	7.6E-08		5.7E-04	3.8E-08	5.7E-04	3.8E-08
Cadmium	7440-43-9	3.5E-04	100	3.5E-06		1.8E-04	1.8E-06	1.8E-04	1.8E-06
Carbazole	86-74-8	5.4E-03	660	8.1E-06		2.7E-03	4.0E-06	2.7E-03	4.0E-06
Carbon disulfide	75-15-0	7.5E-02	6,200	1.2E-05		3.7E-02	6.0E-06	3.7E-02	6.0E-06
Carbon tetrachloride	56-23-5	1.1E-01	1,900	6.0E-05		5.7E-02	3.0E-05	5.7E-02	3.0E-05
Chlorine	7782-50-5	9.0E+01	210	4.3E-01		4.5E+01	2.1E-01	4.5E+01	2.1E-01
Chloro-3-methylphenol, 4-	59-50-7	5.2E-03	5,500	9.4E-07		2.6E-03	4.7E-07	2.6E-03	4.7E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroacetonitrile	107-14-2	8.4E-03	9,000	9.3E-07		4.2E-03	4.7E-07	4.2E-03	4.7E-07
Chloroaniline, p-	106-47-8	1.2E-03	2,200	5.4E-07		5.9E-04	2.7E-07	5.9E-04	2.7E-07
Chlorobenzene	108-90-7	1.9E-02	46,000	4.1E-07		9.5E-03	2.1E-07	9.5E-03	2.1E-07
Chloroethane	75-00-3	3.4E-03	260,000	1.3E-08		1.7E-03	6.4E-09	1.7E-03	6.4E-09
Chloroform (Trichloromethane)	67-66-3	4.7E-02	150	3.1E-04		2.3E-02	1.5E-04	2.3E-02	1.5E-04
Chloronaphthalene,2-	91-58-7	4.2E-03	600	7.0E-06		2.1E-03	3.5E-06	2.1E-03	3.5E-06
Chlorophenol, 2-	95-57-8	1.5E-02	1,300	1.1E-05		7.3E-03	5.6E-06	7.3E-03	5.6E-06
Chromium III	7440-47-3	8.2E-02	1,500	5.5E-05		4.1E-02	2.7E-05	2.1E-03	1.4E-06
Chromium, hexavalent	18540-29-9	6.7E-02	89	7.6E-04		3.4E-02	3.8E-04	1.7E-03	1.9E-05
Chrysene	218-01-9	5.5E-03	600	9.2E-06		2.7E-03	4.6E-06	2.7E-03	4.6E-06
Cis-1,3-dichloropropene	10062-01-5	9.9E-03	600	1.7E-05		5.0E-03	8.3E-06	5.0E-03	8.3E-06
cis-2-Butene	590-18-1	1.3E-02	150,000,000	8.7E-11		6.5E-03	4.3E-11	6.5E-03	4.3E-11
Cobalt	7440-48-4	9.0E-04	180	5.0E-06		4.5E-04	2.5E-06	4.5E-04	2.5E-06
Copper	7440-50-8	1.9E-01	100	1.9E-03		9.3E-02	9.3E-04	9.3E-02	9.3E-04
Cresol, m-	108-39-4	9.8E-04	20,000	4.9E-08		4.9E-04	2.4E-08	4.9E-04	2.4E-08
Cresol, o-	95-48-7	2.5E-02	20,000	1.3E-06		1.3E-02	6.3E-07	1.3E-02	6.3E-07
Cresol, p-	106-44-5	9.8E-04	20,000	4.9E-08		4.9E-04	2.4E-08	4.9E-04	2.4E-08
Crotonaldehyde	4170-30-3	2.4E-02	540	4.5E-05		1.2E-02	2.3E-05	1.2E-02	2.3E-05
Cumene	98-82-8	3.2E-03	250,000	1.3E-08		1.6E-03	6.4E-09	1.6E-03	6.4E-09
Cyclohexane	110-82-7	1.9E-02	340,000	5.6E-08		9.5E-03	2.8E-08	9.5E-03	2.8E-08
Dibenz(a,h)anthracene	53-70-3	7.7E-04	34	2.3E-05		3.9E-04	1.1E-05	3.9E-04	1.1E-05
Dibenzofuran	132-64-9	4.2E-03	30,000	1.4E-07		2.1E-03	7.0E-08	2.1E-03	7.0E-08
Dibromochloromethane	124-48-1	6.7E-03	7,400	9.1E-07		3.4E-03	4.5E-07	3.4E-03	4.5E-07
Dichlorobenzene, 1,2-	95-50-1	4.3E-03	300,000	1.4E-08		2.1E-03	7.1E-09	2.1E-03	7.1E-09
Dichlorobenzene, 1,3-	541-73-1	4.8E-03	16,000	3.0E-07		2.4E-03	1.5E-07	2.4E-03	1.5E-07
Dichlorobenzene,1,4-	106-46-7	4.4E-03	60,000	7.4E-08		2.2E-03	3.7E-08	2.2E-03	3.7E-08
Dichloroethane 1,1-	75-34-3	2.4E-03	650,000	3.8E-09		1.2E-03	1.9E-09	1.2E-03	1.9E-09
Dichloroethane, 1,2	107-06-2	4.1E-03	200,000	2.1E-08		2.1E-03	1.0E-08	2.1E-03	1.0E-08
Dichloroethylene 1,1-	75-35-4	3.3E-03	180,000	1.8E-08		1.6E-03	9.1E-09	1.6E-03	9.1E-09
Dichloroethylene, cis-1,2-	156-59-2	9.2E-04	560,000	1.6E-09		4.6E-04	8.2E-10	4.6E-04	8.2E-10
Dichloroethylene-1,2 (trans)	156-60-5	5.5E-03	1,100,000	5.0E-09		2.7E-03	2.5E-09	2.7E-03	2.5E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorophenol, 2,4-	120-83-2	7.1E-03	1,300	5.4E-06		3.5E-03	2.7E-06	3.5E-03	2.7E-06
Dichloropropane, 1,2-	78-87-5	2.8E-03	140,000	2.0E-08		1.4E-03	1.0E-08	1.4E-03	1.0E-08
Diethyl phthalate	84-66-2	6.1E-03	5,000	1.2E-06		3.0E-03	6.1E-07	3.0E-03	6.1E-07
Dimethyl phthalate	131-11-3	4.2E-03	15,000	2.8E-07		2.1E-03	1.4E-07	2.1E-03	1.4E-07
Dimethylphenol, 2,4-	105-67-9	5.3E-02	4,500	1.2E-05		2.6E-02	5.8E-06	2.6E-02	5.8E-06
Di-n-butyl phthalate	84-74-2	8.4E-02	15,000	5.6E-06		4.2E-02	2.8E-06	4.2E-02	2.8E-06
Dinitrobenzene, 1,3-	99-65-0	4.4E-03	1,000	4.4E-06		2.2E-03	2.2E-06	2.2E-03	2.2E-06
Dinitrophenol, 2,4-	51-28-5	1.8E-01	220	8.4E-04		9.2E-02	4.2E-04	9.2E-02	4.2E-04
Dinitrotoluene, 2,4-	121-14-2	4.2E-03	600	7.0E-06		2.1E-03	3.5E-06	2.1E-03	3.5E-06
Dinitrotoluene, 2,6-	606-20-2	4.3E-03	600	7.2E-06		2.1E-03	3.6E-06	2.1E-03	3.6E-06
Di-n-octylphthalate	117-84-0	2.8E-02	6,800	4.1E-06		1.4E-02	2.1E-06	1.4E-02	2.1E-06
Dioxane, 1,4-	123-91-1	4.9E-03	3,000	1.6E-06		2.4E-03	8.1E-07	2.4E-03	8.1E-07
Diphenylamine	122-39-4	4.2E-03	30,000	1.4E-07		2.1E-03	7.0E-08	2.1E-03	7.0E-08
Ethyl methacrylate	97-63-2	1.2E-02	13,000	9.4E-07		6.1E-03	4.7E-07	6.1E-03	4.7E-07
Ethylbenzene	100-41-4	8.4E-02	140,000	6.0E-07		4.2E-02	3.0E-07	4.2E-02	3.0E-07
Ethylene Dibromide	106-93-4	6.8E-03	130,000	5.2E-08		3.4E-03	2.6E-08	3.4E-03	2.6E-08
Ethylether	60-29-7	1.9E-02	1,500,000	1.3E-08		9.5E-03	6.3E-09	9.5E-03	6.3E-09
Ethylhexyl phthalate, bis-2-	117-81-7	8.9E-03	10,000	8.9E-07		4.4E-03	4.4E-07	4.4E-03	4.4E-07
Fluoranthene	206-44-0	2.0E-02	1,500	1.3E-05		1.0E-02	6.7E-06	1.0E-02	6.7E-06
Fluorene	86-73-7	5.0E-03	6,600	7.6E-07		2.5E-03	3.8E-07	2.5E-03	3.8E-07
Formaldehyde	50-00-0	3.6E-01	55	6.5E-03		1.8E-01	3.3E-03	1.8E-01	3.3E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	2.2E-07	3	7.3E-08		1.1E-07	3.7E-08	1.1E-07	3.7E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	5.5E-06	45	1.2E-07		2.8E-06	6.1E-08	2.8E-06	6.1E-08
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.4E-06	60	2.4E-08		7.2E-07	1.2E-08	7.2E-07	1.2E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	2.7E-08	0.07	3.6E-07		1.3E-08	1.8E-07	1.3E-08	1.8E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	6.7E-08	0.75	9.0E-08		3.4E-08	4.5E-08	3.4E-08	4.5E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	4.6E-08	4	1.2E-08		2.3E-08	5.9E-09	2.3E-08	5.9E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	2.0E-06	0.07	2.7E-05		9.8E-07	1.3E-05	9.8E-07	1.3E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.2E-06	0.04	3.3E-05		6.0E-07	1.6E-05	6.0E-07	1.6E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	9.1E-07	30	3.0E-08		4.5E-07	1.5E-08	4.5E-07	1.5E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.4E-06	0.49	2.9E-06		7.2E-07	1.5E-06	7.2E-07	1.5E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Hexachloro-1,3-butadiene	87-68-3	6.2E-03	11,000	5.6E-07		3.1E-03	2.8E-07	3.1E-03	2.8E-07
Hexachlorobenzene	118-74-1	3.6E-02	6	5.9E-03		1.8E-02	3.0E-03	1.8E-02	3.0E-03
Hexachlorocyclopentadiene	77-47-4	8.4E-02	110	7.6E-04		4.2E-02	3.8E-04	4.2E-02	3.8E-04
Hexachloroethane (Perchloroethane)	67-72-1	4.5E-03	29,000	1.6E-07		2.3E-03	7.8E-08	2.3E-03	7.8E-08
Hexachloropropene	1888-71-7	6.0E-03	905	6.7E-06		3.0E-03	3.3E-06	3.0E-03	3.3E-06
Hexane	110-54-3	7.5E-02	1,100,000	6.8E-08		3.7E-02	3.4E-08	3.7E-02	3.4E-08
Hydrogen chloride	7647-01-0	1.4E+02	2,100	6.5E-02		6.8E+01	3.2E-02	6.8E+01	3.2E-02
Indeno(1,2,3-cd) pyrene	193-39-5	3.0E-03	15	2.0E-04		1.5E-03	9.9E-05	1.5E-03	9.9E-05
Isophorone	78-59-1	4.2E-03	23,000	1.8E-07		2.1E-03	9.1E-08	2.1E-03	9.1E-08
Lead	7439-92-1	3.1E-01	150	2.0E-03		1.5E-01	1.0E-03	1.5E-01	1.0E-03
Manganese	7439-96-5	7.0E-01	3,000	2.3E-04		3.5E-01	1.2E-04	3.5E-01	1.2E-04
Mercuric chloride	7487-94-7	4.0E-05	2,700	1.5E-08		2.0E-05	7.5E-09	2.0E-05	7.5E-09
Methacrylonitrile	126-98-7	4.5E-02	2,700	1.7E-05		2.2E-02	8.3E-06	2.2E-02	8.3E-06
Methyl bromide	74-83-9	9.2E-04	3,900	2.3E-07		4.6E-04	1.2E-07	4.6E-04	1.2E-07
Methyl chloride	74-87-3	1.1E-01	210,000	5.1E-07		5.3E-02	2.5E-07	5.3E-02	2.5E-07
Methyl ethyl ketone	78-93-3	3.0E-02	13,000	2.3E-06		1.5E-02	1.1E-06	1.5E-02	1.1E-06
Methyl isobutyl ketone	108-10-1	6.3E-03	310,000	2.0E-08		3.1E-03	1.0E-08	3.1E-03	1.0E-08
Methyl tert-butyl ether	1634-04-4	9.9E-02	180,000	5.5E-07		5.0E-02	2.8E-07	5.0E-02	2.8E-07
Methylcyclohexane	108-87-2	9.2E-02	1,600,000	5.7E-08		4.6E-02	2.9E-08	4.6E-02	2.9E-08
Methylene chloride	75-09-2	1.8E+00	14,000	1.3E-04		9.1E-01	6.5E-05	9.1E-01	6.5E-05
Methylmethacrylate	80-62-6	1.2E-02	70,000	1.7E-07		6.1E-03	8.7E-08	6.1E-03	8.7E-08
Naphthalene	91-20-3	7.0E-01	79,000	8.9E-06		3.5E-01	4.4E-06	3.5E-01	4.4E-06
Nickel	7440-02-0	4.3E-01	0.20	2.2E+00		2.2E-01	1.1E+00	3.7E-03	1.9E-02
Nitroaniline, 2-	88-74-4	4.2E-03	4,800	8.7E-07		2.1E-03	4.3E-07	2.1E-03	4.3E-07
Nitroaniline, 3-	99-09-2	1.7E-02	110	1.5E-04		8.3E-03	7.6E-05	8.3E-03	7.6E-05
Nitroaniline, 4-	100-01-6	1.7E-02	9,000	1.9E-06		8.3E-03	9.3E-07	8.3E-03	9.3E-07
Nitrobenzene	98-95-3	4.8E-03	9,100	5.2E-07		2.4E-03	2.6E-07	2.4E-03	2.6E-07
Nitrophenol, 2-	88-75-5	3.6E-02	1,000	3.6E-05		1.8E-02	1.8E-05	1.8E-02	1.8E-05
Nitrophenol, 4-	100-02-7	2.8E-02	1,200	2.3E-05		1.4E-02	1.1E-05	1.4E-02	1.1E-05
Nitroso-di-n-butylamine, n-	924-16-3	4.2E-03	2,000	2.1E-06		2.1E-03	1.0E-06	2.1E-03	1.0E-06
Nitrosodiphenylamine, N-	86-30-6	7.4E-04	1,400	5.3E-07		3.7E-04	2.7E-07	3.7E-04	2.7E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Nitrosodipropylamine, n-	621-64-7	4.2E-03	2,000	2.1E-06		2.1E-03	1.0E-06	2.1E-03	1.0E-06
n-Nitrosodiethylamine	55-18-5	4.2E-03	1,700	2.5E-06		2.1E-03	1.2E-06	2.1E-03	1.2E-06
n-Nitrosodimethylamine	62-75-9	4.3E-03	1,700	2.5E-06		2.1E-03	1.3E-06	2.1E-03	1.3E-06
n-Nitrosomethylethylamine	10595-95-6	6.9E-03	1,700	4.1E-06		3.5E-03	2.0E-06	3.5E-03	2.0E-06
n-Nitrosomorpholine	59-89-2	4.2E-03	74	5.7E-05		2.1E-03	2.8E-05	2.1E-03	2.8E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.8E-07	3	9.3E-08		1.4E-07	4.7E-08	1.4E-07	4.7E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	4.0E-06	75	5.3E-08		2.0E-06	2.7E-08	2.0E-06	2.7E-08
o-Tolualdehyde	529-20-4	3.1E-01	17,000	1.8E-05		1.5E-01	9.0E-06	1.5E-01	9.0E-06
p-Dimethylaminoazobenzene	60-11-7	4.1E-03	670	6.2E-06		2.1E-03	3.1E-06	2.1E-03	3.1E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	5.1E-08	0.10	5.1E-07		2.5E-08	2.5E-07	2.5E-08	2.5E-07
PentaCDF, 1,2,3,7,8-	57117-41-6	6.1E-07	0.24	2.5E-06		3.0E-07	1.3E-06	3.0E-07	1.3E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	1.2E-06	0.07	1.6E-05		6.1E-07	8.2E-06	6.1E-07	8.2E-06
Pentachlorobenzene	608-93-5	4.2E-03	1,600	2.6E-06		2.1E-03	1.3E-06	2.1E-03	1.3E-06
Pentachloroethane	76-01-7	5.3E-03	320,000	1.7E-08		2.7E-03	8.3E-09	2.7E-03	8.3E-09
Pentachloronitrobenzene	82-68-8	4.4E-03	1,500	3.0E-06		2.2E-03	1.5E-06	2.2E-03	1.5E-06
Pentachlorophenol	87-86-5	2.1E-01	1,400	1.5E-04		1.0E-01	7.5E-05	1.0E-01	7.5E-05
Perchlorate	14797-73-0	3.7E-03	23	1.6E-04		1.9E-03	8.0E-05	1.9E-03	8.0E-05
Phenanthrene	85-01-8	2.4E-02	760	3.2E-05		1.2E-02	1.6E-05	1.2E-02	1.6E-05
Phenol	108-95-2	2.3E-02	5,800	3.9E-06		1.1E-02	2.0E-06	1.1E-02	2.0E-06
Phosphorous	7723-14-0	8.2E-01	270	3.1E-03		4.1E-01	1.5E-03	4.1E-01	1.5E-03
Propanal	123-38-6	4.0E-01	110,000	3.6E-06		2.0E-01	1.8E-06	2.0E-01	1.8E-06
Propylbenzene	103-65-1	3.5E-02	5,400	6.5E-06		1.8E-02	3.2E-06	1.8E-02	3.2E-06
Propylene	115-07-1	3.7E-01	860,000	4.4E-07		1.9E-01	2.2E-07	1.9E-01	2.2E-07
Pyrene	129-00-0	1.7E-02	150	1.1E-04		8.6E-03	5.7E-05	8.6E-03	5.7E-05
Pyridine	110-86-1	6.2E-03	9,700	6.4E-07		3.1E-03	3.2E-07	3.1E-03	3.2E-07
Selenium	7782-49-2	1.2E-02	200	6.0E-05		6.0E-03	3.0E-05	6.0E-03	3.0E-05
Silver	7440-22-4	9.0E-03	100	9.0E-05		4.5E-03	4.5E-05	4.5E-03	4.5E-05
Styrene	100-42-5	9.9E-03	21,000	4.7E-07		5.0E-03	2.4E-07	5.0E-03	2.4E-07
TetraCDD, 2,3,7,8-	1746-01-6	1.8E-08	0.00003	5.8E-04		8.7E-09	2.9E-04	8.7E-09	2.9E-04
TetraCDF, 2,3,7,8-	51207-31-9	3.0E-07	0.07	4.1E-06		1.5E-07	2.1E-06	1.5E-07	2.1E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	4.2E-03	240	1.7E-05		2.1E-03	8.7E-06	2.1E-03	8.7E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Tetrachloroethane, 1,1,2,2-	79-34-5	3.2E-03	7,000	4.6E-07		1.6E-03	2.3E-07	1.6E-03	2.3E-07
Tetrachloroethylene	127-18-4	1.9E-02	20,000	9.5E-07		9.5E-03	4.8E-07	9.5E-03	4.8E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	5.4E-03	1,300	4.2E-06		2.7E-03	2.1E-06	2.7E-03	2.1E-06
Tetrahydrofuran	109-99-9	6.9E-03	290,000	2.4E-08		3.4E-03	1.2E-08	3.4E-03	1.2E-08
Toluene	108-88-3	2.1E-01	37,000	5.8E-06		1.1E-01	2.9E-06	1.1E-01	2.9E-06
Toluidine, o-	95-53-4	5.4E-02	8,800	6.1E-06		2.7E-02	3.0E-06	2.7E-02	3.0E-06
Trans-1,3-dichloropropene	10061-02-6	4.7E-03	75,000	6.2E-08		2.3E-03	3.1E-08	2.3E-03	3.1E-08
trans-2-Butene	624-64-6	5.9E-02	1,000,000	5.9E-08		2.9E-02	2.9E-08	2.9E-02	2.9E-08
Trichlorobenzene, 1,2,4-	120-82-1	4.9E-03	3,400	1.5E-06		2.5E-03	7.2E-07	2.5E-03	7.2E-07
Trichloroethane, 1,1,1-	71-55-6	2.1E-03	1,300,000	1.6E-09		1.0E-03	7.9E-10	1.0E-03	7.9E-10
Trichloroethane, 1,1,2-	79-00-5	5.6E-03	81,000	6.9E-08		2.8E-03	3.4E-08	2.8E-03	3.4E-08
Trichloroethylene	79-01-6	7.2E-03	700,000	1.0E-08		3.6E-03	5.1E-09	3.6E-03	5.1E-09
Trichlorophenol, 2,4,5-	95-95-4	1.1E-02	7,400	1.5E-06		5.4E-03	7.3E-07	5.4E-03	7.3E-07
Trichlorophenol, 2,4,6-	88-06-2	1.0E-02	1,800	5.6E-06		5.0E-03	2.8E-06	5.0E-03	2.8E-06
Trimethylbenzene, 1,3,5-	108-67-8	1.5E-01	690,000	2.1E-07		7.2E-02	1.0E-07	7.2E-02	1.0E-07
Trinitrobenzene, 1,3,5	99-35-4	4.2E-03	530	7.9E-06		2.1E-03	3.9E-06	2.1E-03	3.9E-06
Undecane	1120-21-4	9.2E-02	1,500	6.1E-05		4.6E-02	3.0E-05	4.6E-02	3.0E-05
Vinyl Chloride	75-01-4	5.8E-02	180,000	3.2E-07		2.9E-02	1.6E-07	2.9E-02	1.6E-07
Xylene, m-	108-38-3	8.4E-02	22,000	3.8E-06		4.2E-02	1.9E-06	4.2E-02	1.9E-06
Xylene, o-	95-47-6	9.9E-02	22,000	4.5E-06		5.0E-02	2.3E-06	5.0E-02	2.3E-06
Xylene, p-	106-42-3	8.4E-02	22,000	3.8E-06		4.2E-02	1.9E-06	4.2E-02	1.9E-06
Zinc	7440-66-6	4.2E-01	1,900	2.2E-04		2.1E-01	1.1E-04	2.1E-01	1.1E-04
			Total	**2.8**		**Total**	**1.4**	**With adjusted Ni & Cr**	**0.4**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	2.7E-04	690,000	4.0E-10		1.4E-04	2.0E-10	1.4E-04	2.0E-10
1,2,4-Trimethylbenzene	95-63-6	1.6E-02	690,000	2.4E-08		8.1E-03	1.2E-08	8.1E-03	1.2E-08
1,4-Diethylbenzene	105-05-5	4.4E-04	12,000	3.6E-08		2.2E-04	1.8E-08	2.2E-04	1.8E-08
1-Butene	106-98-9	1.4E-02	1,200,000	1.2E-08		7.1E-03	5.9E-09	7.1E-03	5.9E-09
1-Chloronapthalene	90-13-1	3.6E-04	4,600	7.7E-08		1.8E-04	3.9E-08	1.8E-04	3.9E-08
1-Naphthylamine	134-32-7	7.1E-03	210	3.4E-05		3.6E-03	1.7E-05	3.6E-03	1.7E-05
2,2,4-Trimethylpentane	540-84-1	1.6E-02	14,000,000	1.1E-09		7.8E-03	5.6E-10	7.8E-03	5.6E-10
2,2-Dimethylbutane	75-83-2	9.1E-04	1,800,000	5.1E-10		4.5E-04	2.5E-10	4.5E-04	2.5E-10
2,3,4-Trimethylpentane	565-75-3	5.3E-03	14,000,000	3.8E-10		2.7E-03	1.9E-10	2.7E-03	1.9E-10
2,3-Dimethylbutane	79-29-8	2.3E-03	1,800,000	1.3E-09		1.1E-03	6.3E-10	1.1E-03	6.3E-10
2,3-Dimethylpentane	565-59-3	9.1E-03	1,800,000	5.1E-09		4.5E-03	2.5E-09	4.5E-03	2.5E-09
2,4-Dimethylpentane	108-08-7	3.4E-03	180,000	1.9E-08		1.7E-03	9.4E-09	1.7E-03	9.4E-09
2,5-Dimethylbenzaldehyde	5779-94-2	1.8E-02	17,000	1.0E-06		8.7E-03	5.1E-07	8.7E-03	5.1E-07
2,6-Dichlorophenol	87-65-0	3.6E-04	8,800	4.0E-08		1.8E-04	2.0E-08	1.8E-04	2.0E-08
2-Ethyltoluene	611-14-3	2.9E-04	12,000	2.4E-08		1.5E-04	1.2E-08	1.5E-04	1.2E-08
2-Hexanone	591-78-6	1.3E-03	41,000	3.2E-08		6.5E-04	1.6E-08	6.5E-04	1.6E-08
2-Methylhexane	591-76-4	1.1E-02	1,800,000	6.1E-09		5.5E-03	3.1E-09	5.5E-03	3.1E-09
2-Methylnaphthalene	91-57-6	4.9E-03	3,000	1.6E-06		2.4E-03	8.1E-07	2.4E-03	8.1E-07
2-Methylpentane	107-83-5	7.1E-03	1,800,000	4.0E-09		3.6E-03	2.0E-09	3.6E-03	2.0E-09
2-Naphthylamine	91-59-8	6.9E-03	320	2.2E-05		3.4E-03	1.1E-05	3.4E-03	1.1E-05
3-Ethyltoluene	620-14-4	3.1E-03	12,000	2.6E-07		1.6E-03	1.3E-07	1.6E-03	1.3E-07
3-Methylheptane	589-81-1	2.3E-03	1,400,000	1.6E-09		1.1E-03	8.1E-10	1.1E-03	8.1E-10
3-Methylhexane	589-34-4	1.4E-02	1,800,000	7.9E-09		7.1E-03	4.0E-09	7.1E-03	4.0E-09
3-Methylpentane	96-14-0	4.6E-03	1,800,000	2.6E-09		2.3E-03	1.3E-09	2.3E-03	1.3E-09
4,6-Dinitro-2-methylphenol	534-52-1	6.2E-03	200	3.1E-05		3.1E-03	1.5E-05	3.1E-03	1.5E-05
4-Aminobyphenyl	92-67-1	7.1E-03	490	1.5E-05		3.5E-03	7.2E-06	3.5E-03	7.2E-06
4-Ethyltoluene	622-96-8	3.4E-03	12,000	2.9E-07		1.7E-03	1.4E-07	1.7E-03	1.4E-07
Acenaphthene	83-32-9	3.6E-04	3,600	9.9E-08		1.8E-04	4.9E-08	1.8E-04	4.9E-08
Acenaphthylene	208-96-8	2.0E-03	10,000	2.0E-07		1.0E-03	1.0E-07	1.0E-03	1.0E-07

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	6.0E-02	470	1.3E-04		3.0E-02	6.4E-05	3.0E-02	6.4E-05
Acetone	67-64-1	1.6E-02	470,000	3.3E-08		7.8E-03	1.7E-08	7.8E-03	1.7E-08
Acetonitrile	75-05-8	1.2E-02	22,000	5.6E-07		6.2E-03	2.8E-07	6.2E-03	2.8E-07
Acetophenone	98-86-2	1.7E-03	10,000	1.7E-07		8.7E-04	8.7E-08	8.7E-04	8.7E-08
Acrylonitrile	107-13-1	1.0E-02	10,000	1.0E-06		5.2E-03	5.2E-07	5.2E-03	5.2E-07
Aluminum	7429-90-5	2.2E+01	3,000	7.2E-03		1.1E+01	3.6E-03	1.1E+01	3.6E-03
Aniline	62-53-3	5.2E-03	30,000	1.7E-07		2.6E-03	8.6E-08	2.6E-03	8.6E-08
Anthracene	120-12-7	8.4E-05	270	3.1E-07		4.2E-05	1.6E-07	4.2E-05	1.6E-07
Antimony	7440-36-0	1.9E-02	500	3.8E-05		9.4E-03	1.9E-05	9.4E-03	1.9E-05
Arsenic	7440-38-2	3.0E-04	0.20	1.5E-03		1.5E-04	7.5E-04	1.5E-04	7.5E-04
Barium	7440-39-3	2.1E-04	1,500	1.4E-07		1.1E-04	7.1E-08	1.1E-04	7.1E-08
Benzaldehyde	100-52-7	2.5E-02	17,000	1.5E-06		1.2E-02	7.2E-07	1.2E-02	7.2E-07
Benzene	71-43-2	7.8E-02	27	2.9E-03		3.9E-02	1.4E-03	3.9E-02	1.4E-03
Benzo(a)anthracene	56-55-3	3.5E-04	1,200	2.9E-07		1.8E-04	1.5E-07	1.8E-04	1.5E-07
Benzo(a)pyrene	50-32-8	4.5E-05	600	7.5E-08		2.3E-05	3.8E-08	2.3E-05	3.8E-08
Benzo(b)fluoranthene	205-99-2	7.4E-04	31	2.4E-05		3.7E-04	1.2E-05	3.7E-04	1.2E-05
Benzo(g,h,i)perylene	191-24-2	2.5E-04	30,000	8.2E-09		1.2E-04	4.1E-09	1.2E-04	4.1E-09
Benzo(k)fluoranthene	207-08-9	6.7E-04	19	3.5E-05		3.4E-04	1.8E-05	3.4E-04	1.8E-05
Benzoic acid	65-85-0	4.1E-02	2,800	1.4E-05		2.0E-02	7.2E-06	2.0E-02	7.2E-06
Benzyl alcohol	100-51-6	5.0E-04	130,000	3.9E-09		2.5E-04	1.9E-09	2.5E-04	1.9E-09
Benzyl chloride	100-44-7	3.7E-04	240	1.5E-06		1.8E-04	7.7E-07	1.8E-04	7.7E-07
Bis(2-chlorethyl)ether	111-44-4	4.0E-04	58,000	6.9E-09		2.0E-04	3.4E-09	2.0E-04	3.4E-09
Bis(2-chloroethoxy)methane	111-91-1	3.6E-04	920	3.9E-07		1.8E-04	1.9E-07	1.8E-04	1.9E-07
Bromodichloromethane	75-27-4	5.1E-04	260	1.9E-06		2.5E-04	9.7E-07	2.5E-04	9.7E-07
Bromoform	75-25-2	8.4E-04	15,000	5.6E-08		4.2E-04	2.8E-08	4.2E-04	2.8E-08
Bromophenyl-phenylether, 4-	101-55-3	3.6E-04	290	1.2E-06		1.8E-04	6.1E-07	1.8E-04	6.1E-07
Butylbenzylphthalate	85-68-7	9.7E-05	15,000	6.4E-09		4.8E-05	3.2E-09	4.8E-05	3.2E-09
Cadmium	7440-43-9	2.6E-05	100	2.6E-07		1.3E-05	1.3E-07	1.3E-05	1.3E-07
Carbazole	86-74-8	4.6E-04	660	6.9E-07		2.3E-04	3.4E-07	2.3E-04	3.4E-07

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	6.4E-03	6,200	1.0E-06		3.2E-03	5.1E-07	3.2E-03	5.1E-07
Carbon tetrachloride	56-23-5	9.7E-03	1,900	5.1E-06		4.9E-03	2.6E-06	4.9E-03	2.6E-06
Chlorine	7782-50-5	7.7E+00	210	3.6E-02		3.8E+00	1.8E-02	3.8E+00	1.8E-02
Chloro-3-methylphenol, 4-	59-50-7	4.4E-04	5,500	8.0E-08		2.2E-04	4.0E-08	2.2E-04	4.0E-08
Chloroacetonitrile	107-14-2	7.1E-04	9,000	7.9E-08		3.6E-04	4.0E-08	3.6E-04	4.0E-08
Chloroaniline, p-	106-47-8	1.0E-04	2,200	4.6E-08		5.0E-05	2.3E-08	5.0E-05	2.3E-08
Chlorobenzene	108-90-7	1.6E-03	46,000	3.5E-08		8.1E-04	1.8E-08	8.1E-04	1.8E-08
Chloroethane	75-00-3	2.9E-04	260,000	1.1E-09		1.4E-04	5.5E-10	1.4E-04	5.5E-10
Chloroform (Trichloromethane)	67-66-3	4.0E-03	150	2.6E-05		2.0E-03	1.3E-05	2.0E-03	1.3E-05
Chloronaphthalene,2-	91-58-7	3.6E-04	600	5.9E-07		1.8E-04	3.0E-07	1.8E-04	3.0E-07
Chlorophenol, 2-	95-57-8	1.2E-03	1,300	9.6E-07		6.2E-04	4.8E-07	6.2E-04	4.8E-07
Chromium III	7440-47-3	6.0E-03	1,500	4.0E-06		3.0E-03	2.0E-06	1.5E-04	9.9E-08
Chromium, hexavalent	18540-29-9	4.9E-03	89	5.5E-05		2.4E-03	2.7E-05	1.2E-04	1.4E-06
Chrysene	218-01-9	4.5E-04	600	7.6E-07		2.3E-04	3.8E-07	2.3E-04	3.8E-07
Cis-1,3-dichloropropene	10062-01-5	8.4E-04	600	1.4E-06		4.2E-04	7.0E-07	4.2E-04	7.0E-07
cis-2-Butene	590-18-1	1.1E-03	150,000,000	7.4E-12		5.5E-04	3.7E-12	5.5E-04	3.7E-12
Cobalt	7440-48-4	6.5E-05	180	3.6E-07		3.2E-05	1.8E-07	3.2E-05	1.8E-07
Copper	7440-50-8	1.4E-02	100	1.4E-04		6.8E-03	6.8E-05	6.8E-03	6.8E-05
Cresol, m-	108-39-4	8.3E-05	20,000	4.2E-09		4.2E-05	2.1E-09	4.2E-05	2.1E-09
Cresol, o-	95-48-7	2.1E-03	20,000	1.1E-07		1.1E-03	5.3E-08	1.1E-03	5.3E-08
Cresol, p-	106-44-5	8.3E-05	20,000	4.2E-09		4.2E-05	2.1E-09	4.2E-05	2.1E-09
Crotonaldehyde	4170-30-3	2.1E-03	540	3.8E-06		1.0E-03	1.9E-06	1.0E-03	1.9E-06
Cumene	98-82-8	2.7E-04	250,000	1.1E-09		1.4E-04	5.4E-10	1.4E-04	5.4E-10
Cyclohexane	110-82-7	1.6E-03	340,000	4.8E-09		8.1E-04	2.4E-09	8.1E-04	2.4E-09
Dibenz(a,h)anthracene	53-70-3	5.8E-05	34	1.7E-06		2.9E-05	8.5E-07	2.9E-05	8.5E-07
Dibenzofuran	132-64-9	3.6E-04	30,000	1.2E-08		1.8E-04	5.9E-09	1.8E-04	5.9E-09
Dibromochloromethane	124-48-1	5.7E-04	7,400	7.7E-08		2.9E-04	3.9E-08	2.9E-04	3.9E-08
Dichlorobenzene, 1,2-	95-50-1	3.6E-04	300,000	1.2E-09		1.8E-04	6.0E-10	1.8E-04	6.0E-10
Dichlorobenzene, 1,3-	541-73-1	4.1E-04	16,000	2.5E-08		2.0E-04	1.3E-08	2.0E-04	1.3E-08

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	3.8E-04	60,000	6.3E-09		1.9E-04	3.1E-09	1.9E-04	3.1E-09
Dichloroethane 1,1-	75-34-3	2.1E-04	650,000	3.2E-10		1.0E-04	1.6E-10	1.0E-04	1.6E-10
Dichloroethane, 1,2	107-06-2	3.5E-04	200,000	1.8E-09		1.7E-04	8.7E-10	1.7E-04	8.7E-10
Dichloroethylene 1,1-	75-35-4	2.8E-04	180,000	1.6E-09		1.4E-04	7.7E-10	1.4E-04	7.7E-10
Dichloroethylene, cis-1,2-	156-59-2	7.8E-05	560,000	1.4E-10		3.9E-05	6.9E-11	3.9E-05	6.9E-11
Dichloroethylene-1,2 (trans)	156-60-5	4.7E-04	1,100,000	4.3E-10		2.3E-04	2.1E-10	2.3E-04	2.1E-10
Dichlorophenol, 2,4-	120-83-2	6.0E-04	1,300	4.6E-07		3.0E-04	2.3E-07	3.0E-04	2.3E-07
Dichloropropane, 1,2-	78-87-5	2.4E-04	140,000	1.7E-09		1.2E-04	8.6E-10	1.2E-04	8.6E-10
Diethyl phthalate	84-66-2	5.2E-04	5,000	1.0E-07		2.6E-04	5.2E-08	2.6E-04	5.2E-08
Dimethyl phthalate	131-11-3	3.6E-04	15,000	2.4E-08		1.8E-04	1.2E-08	1.8E-04	1.2E-08
Dimethylphenol, 2,4-	105-67-9	4.5E-03	4,500	1.0E-06		2.2E-03	5.0E-07	2.2E-03	5.0E-07
Di-n-butyl phthalate	84-74-2	7.1E-03	15,000	4.8E-07		3.6E-03	2.4E-07	3.6E-03	2.4E-07
Dinitrobenzene, 1,3-	99-65-0	3.7E-04	1,000	3.7E-07		1.8E-04	1.8E-07	1.8E-04	1.8E-07
Dinitrophenol, 2,4-	51-28-5	1.6E-02	220	7.1E-05		7.8E-03	3.6E-05	7.8E-03	3.6E-05
Dinitrotoluene, 2,4-	121-14-2	3.6E-04	600	5.9E-07		1.8E-04	3.0E-07	1.8E-04	3.0E-07
Dinitrotoluene, 2,6-	606-20-2	3.7E-04	600	6.1E-07		1.8E-04	3.0E-07	1.8E-04	3.0E-07
Di-n-octylphthalate	117-84-0	2.4E-03	6,800	3.5E-07		1.2E-03	1.7E-07	1.2E-03	1.7E-07
Dioxane, 1,4-	123-91-1	4.2E-04	3,000	1.4E-07		2.1E-04	6.9E-08	2.1E-04	6.9E-08
Diphenylamine	122-39-4	3.6E-04	30,000	1.2E-08		1.8E-04	5.9E-09	1.8E-04	5.9E-09
Ethyl methacrylate	97-63-2	1.0E-03	13,000	8.0E-08		5.2E-04	4.0E-08	5.2E-04	4.0E-08
Ethylbenzene	100-41-4	7.1E-03	140,000	5.1E-08		3.6E-03	2.5E-08	3.6E-03	2.5E-08
Ethylene Dibromide	106-93-4	5.8E-04	130,000	4.4E-09		2.9E-04	2.2E-09	2.9E-04	2.2E-09
Ethylether	60-29-7	1.6E-03	1,500,000	1.1E-09		8.1E-04	5.4E-10	8.1E-04	5.4E-10
Ethylhexyl phthalate, bis-2-	117-81-7	6.7E-04	10,000	6.7E-08		3.3E-04	3.3E-08	3.3E-04	3.3E-08
Fluoranthene	206-44-0	1.7E-03	1,500	1.1E-06		8.5E-04	5.7E-07	8.5E-04	5.7E-07
Fluorene	86-73-7	4.2E-04	6,600	6.4E-08		2.1E-04	3.2E-08	2.1E-04	3.2E-08
Formaldehyde	50-00-0	3.1E-02	55	5.5E-04		1.5E-02	2.8E-04	1.5E-02	2.8E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	1.6E-08	3	5.4E-09		8.1E-09	2.7E-09	8.1E-09	2.7E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	4.1E-07	45	9.1E-09		2.0E-07	4.6E-09	2.0E-07	4.6E-09

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.1E-07	60	1.8E-09		5.4E-08	8.9E-10	5.4E-08	8.9E-10
HexaCDD, 1,2,3,4,7,8-	39227-28-6	2.0E-09	0.07	2.7E-08		9.8E-10	1.3E-08	9.8E-10	1.3E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	5.0E-09	0.75	6.7E-09		2.5E-09	3.3E-09	2.5E-09	3.3E-09
HexaCDD, 1,2,3,7,8,9-	19408-74-3	3.4E-09	4	8.8E-10		1.7E-09	4.4E-10	1.7E-09	4.4E-10
HexaCDF, 1,2,3,4,7,8-	70648-26-9	1.5E-07	0.07	2.0E-06		7.3E-08	9.9E-07	7.3E-08	9.9E-07
HexaCDF, 1,2,3,6,7,8-	57117-44-9	9.1E-08	0.04	2.4E-06		4.5E-08	1.2E-06	4.5E-08	1.2E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	6.8E-08	30	2.3E-09		3.4E-08	1.1E-09	3.4E-08	1.1E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.1E-07	0.49	2.2E-07		5.4E-08	1.1E-07	5.4E-08	1.1E-07
Hexachloro-1,3-butadiene	87-68-3	5.3E-04	11,000	4.8E-08		2.6E-04	2.4E-08	2.6E-04	2.4E-08
Hexachlorobenzene	118-74-1	3.0E-03	6	5.0E-04		1.5E-03	2.5E-04	1.5E-03	2.5E-04
Hexachlorocyclopentadiene	77-47-4	7.1E-03	110	6.5E-05		3.6E-03	3.2E-05	3.6E-03	3.2E-05
Hexachloroethane (Perchloroethane)	67-72-1	3.8E-04	29,000	1.3E-08		1.9E-04	6.6E-09	1.9E-04	6.6E-09
Hexachloropropene	1888-71-7	5.1E-04	905	5.7E-07		2.6E-04	2.8E-07	2.6E-04	2.8E-07
Hexane	110-54-3	6.4E-03	1,100,000	5.8E-09		3.2E-03	2.9E-09	3.2E-03	2.9E-09
Hydrogen chloride	7647-01-0	1.2E+01	2,100	5.5E-03		5.8E+00	2.7E-03	5.8E+00	2.7E-03
Indeno(1,2,3-cd) pyrene	193-39-5	2.2E-04	15	1.4E-05		1.1E-04	7.2E-06	1.1E-04	7.2E-06
Isophorone	78-59-1	3.6E-04	23,000	1.5E-08		1.8E-04	7.7E-09	1.8E-04	7.7E-09
Lead	7439-92-1	2.2E-02	150	1.5E-04		1.1E-02	7.4E-05	1.1E-02	7.4E-05
Manganese	7439-96-5	5.1E-02	3,000	1.7E-05		2.5E-02	8.5E-06	2.5E-02	8.5E-06
Mercuric chloride	7487-94-7	3.0E-06	2,700	1.1E-09		1.5E-06	5.5E-10	1.5E-06	5.5E-10
Methacrylonitrile	126-98-7	3.8E-03	2,700	1.4E-06		1.9E-03	7.1E-07	1.9E-03	7.1E-07
Methyl bromide	74-83-9	7.8E-05	3,900	2.0E-08		3.9E-05	1.0E-08	3.9E-05	1.0E-08
Methyl chloride	74-87-3	9.1E-03	210,000	4.3E-08		4.5E-03	2.2E-08	4.5E-03	2.2E-08
Methyl ethyl ketone	78-93-3	2.5E-03	13,000	1.9E-07		1.3E-03	9.7E-08	1.3E-03	9.7E-08
Methyl isobutyl ketone	108-10-1	5.3E-04	310,000	1.7E-09		2.7E-04	8.6E-10	2.7E-04	8.6E-10
Methyl tert-butyl ether	1634-04-4	8.4E-03	180,000	4.7E-08		4.2E-03	2.3E-08	4.2E-03	2.3E-08
Methylcyclohexane	108-87-2	7.8E-03	1,600,000	4.9E-09		3.9E-03	2.4E-09	3.9E-03	2.4E-09
Methylene chloride	75-09-2	1.6E-01	14,000	1.1E-05		7.8E-02	5.6E-06	7.8E-02	5.6E-06
Methylmethacrylate	80-62-6	1.0E-03	70,000	1.5E-08		5.2E-04	7.4E-09	5.2E-04	7.4E-09

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	5.9E-02	79,000	7.5E-07		3.0E-02	3.8E-07	3.0E-02	3.8E-07
Nickel	7440-02-0	3.2E-02	0.20	1.6E-01		1.6E-02	7.9E-02	2.7E-04	1.4E-03
Nitroaniline, 2-	88-74-4	3.6E-04	4,800	7.4E-08		1.8E-04	3.7E-08	1.8E-04	3.7E-08
Nitroaniline, 3-	99-09-2	1.4E-03	110	1.3E-05		7.1E-04	6.5E-06	7.1E-04	6.5E-06
Nitroaniline, 4-	100-01-6	1.4E-03	9,000	1.6E-07		7.1E-04	7.9E-08	7.1E-04	7.9E-08
Nitrobenzene	98-95-3	4.1E-04	9,100	4.5E-08		2.0E-04	2.2E-08	2.0E-04	2.2E-08
Nitrophenol, 2-	88-75-5	3.1E-03	1,000	3.1E-06		1.5E-03	1.5E-06	1.5E-03	1.5E-06
Nitrophenol, 4-	100-02-7	2.3E-03	1,200	2.0E-06		1.2E-03	9.7E-07	1.2E-03	9.7E-07
Nitroso-di-n-butylamine, n-	924-16-3	3.6E-04	2,000	1.8E-07		1.8E-04	8.9E-08	1.8E-04	8.9E-08
Nitrosodiphenylamine, N-	86-30-6	6.3E-05	1,400	4.5E-08		3.2E-05	2.3E-08	3.2E-05	2.3E-08
Nitrosodipropylamine, n-	621-64-7	3.6E-04	2,000	1.8E-07		1.8E-04	8.9E-08	1.8E-04	8.9E-08
n-Nitrosodiethylamine	55-18-5	3.6E-04	1,700	2.1E-07		1.8E-04	1.0E-07	1.8E-04	1.0E-07
n-Nitrosodimethylamine	62-75-9	3.6E-04	1,700	2.1E-07		1.8E-04	1.1E-07	1.8E-04	1.1E-07
n-Nitrosomethylethylamine	10595-95-6	5.9E-04	1,700	3.5E-07		2.9E-04	1.7E-07	2.9E-04	1.7E-07
n-Nitrosomorpholine	59-89-2	3.6E-04	74	4.8E-06		1.8E-04	2.4E-06	1.8E-04	2.4E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.1E-08	3	6.9E-09		1.0E-08	3.5E-09	1.0E-08	3.5E-09
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	3.0E-07	75	4.0E-09		1.5E-07	2.0E-09	1.5E-07	2.0E-09
o-Tolualdehyde	529-20-4	2.6E-02	17,000	1.5E-06		1.3E-02	7.6E-07	1.3E-02	7.6E-07
p-Dimethylaminoazobenzene	60-11-7	3.1E-04	670	4.6E-07		1.5E-04	2.3E-07	1.5E-04	2.3E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	3.8E-09	0.10	3.8E-08		1.9E-09	1.9E-08	1.9E-09	1.9E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	4.7E-08	0.24	1.9E-07		2.3E-08	9.7E-08	2.3E-08	9.7E-08
PentaCDF, 2,3,4,7,8-	57117-31-4	9.3E-08	0.07	1.3E-06		4.6E-08	6.3E-07	4.6E-08	6.3E-07
Pentachlorobenzene	608-93-5	3.6E-04	1,600	2.2E-07		1.8E-04	1.1E-07	1.8E-04	1.1E-07
Pentachloroethane	76-01-7	4.5E-04	320,000	1.4E-09		2.3E-04	7.1E-10	2.3E-04	7.1E-10
Pentachloronitrobenzene	82-68-8	3.8E-04	1,500	2.5E-07		1.9E-04	1.3E-07	1.9E-04	1.3E-07
Pentachlorophenol	87-86-5	1.8E-02	1,400	1.3E-05		8.9E-03	6.3E-06	8.9E-03	6.3E-06
Perchlorate	14797-73-0	2.8E-04	23	1.2E-05		1.4E-04	6.0E-06	1.4E-04	6.0E-06
Phenanthrene	85-01-8	2.1E-03	760	2.7E-06		1.0E-03	1.4E-06	1.0E-03	1.4E-06
Phenol	108-95-2	1.9E-03	5,800	3.3E-07		9.7E-04	1.7E-07	9.7E-04	1.7E-07

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	6.0E-02	270	2.2E-04		3.0E-02	1.1E-04	3.0E-02	1.1E-04
Propanal	123-38-6	3.4E-02	110,000	3.1E-07		1.7E-02	1.5E-07	1.7E-02	1.5E-07
Propylbenzene	103-65-1	3.0E-03	5,400	5.5E-07		1.5E-03	2.8E-07	1.5E-03	2.8E-07
Propylene	115-07-1	3.2E-02	860,000	3.7E-08		1.6E-02	1.8E-08	1.6E-02	1.8E-08
Pyrene	129-00-0	1.5E-03	150	9.7E-06		7.3E-04	4.9E-06	7.3E-04	4.9E-06
Pyridine	110-86-1	5.3E-04	9,700	5.4E-08		2.6E-04	2.7E-08	2.6E-04	2.7E-08
Selenium	7782-49-2	8.7E-04	200	4.3E-06		4.3E-04	2.2E-06	4.3E-04	2.2E-06
Silver	7440-22-4	6.5E-04	100	6.5E-06		3.3E-04	3.3E-06	3.3E-04	3.3E-06
Styrene	100-42-5	8.4E-04	21,000	4.0E-08		4.2E-04	2.0E-08	4.2E-04	2.0E-08
TetraCDD, 2,3,7,8-	1746-01-6	1.4E-09	0.00003	4.8E-05		7.1E-10	2.4E-05	7.1E-10	2.4E-05
TetraCDF, 2,3,7,8-	51207-31-9	2.5E-08	0.07	3.4E-07		1.3E-08	1.7E-07	1.3E-08	1.7E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	3.6E-04	240	1.5E-06		1.8E-04	7.4E-07	1.8E-04	7.4E-07
Tetrachloroethane, 1,1,2,2-	79-34-5	2.7E-04	7,000	3.9E-08		1.4E-04	1.9E-08	1.4E-04	1.9E-08
Tetrachloroethylene	127-18-4	1.6E-03	20,000	8.1E-08		8.1E-04	4.1E-08	8.1E-04	4.1E-08
Tetrachlorophenol, 2,3,4,6-	58-90-2	4.6E-04	1,300	3.6E-07		2.3E-04	1.8E-07	2.3E-04	1.8E-07
Tetrahydrofuran	109-99-9	5.8E-04	290,000	2.0E-09		2.9E-04	1.0E-09	2.9E-04	1.0E-09
Toluene	108-88-3	1.8E-02	37,000	4.9E-07		9.1E-03	2.5E-07	9.1E-03	2.5E-07
Toluidine, o-	95-53-4	4.6E-03	8,800	5.2E-07		2.3E-03	2.6E-07	2.3E-03	2.6E-07
Trans-1,3-dichloropropene	10061-02-6	4.0E-04	75,000	5.3E-09		2.0E-04	2.6E-09	2.0E-04	2.6E-09
trans-2-Butene	624-64-6	5.0E-03	1,000,000	5.0E-09		2.5E-03	2.5E-09	2.5E-03	2.5E-09
Trichlorobenzene, 1,2,4-	120-82-1	4.2E-04	3,400	1.2E-07		2.1E-04	6.2E-08	2.1E-04	6.2E-08
Trichloroethane, 1,1,1-	71-55-6	1.8E-04	1,300,000	1.3E-10		8.7E-05	6.7E-11	8.7E-05	6.7E-11
Trichloroethane, 1,1,2-	79-00-5	4.7E-04	81,000	5.9E-09		2.4E-04	2.9E-09	2.4E-04	2.9E-09
Trichloroethylene	79-01-6	6.1E-04	700,000	8.7E-10		3.0E-04	4.4E-10	3.0E-04	4.4E-10
Trichlorophenol, 2,4,5-	95-95-4	9.2E-04	7,400	1.2E-07		4.6E-04	6.2E-08	4.6E-04	6.2E-08
Trichlorophenol, 2,4,6-	88-06-2	8.5E-04	1,800	4.7E-07		4.2E-04	2.4E-07	4.2E-04	2.4E-07
Trimethylbenzene, 1,3,5-	108-67-8	1.2E-02	690,000	1.8E-08		6.2E-03	8.9E-09	6.2E-03	8.9E-09
Trinitrobenzene, 1,3,5	99-35-4	3.6E-04	530	6.7E-07		1.8E-04	3.3E-07	1.8E-04	3.3E-07
Undecane	1120-21-4	7.8E-03	1,500	5.2E-06		3.9E-03	2.6E-06	3.9E-03	2.6E-06

Source M-136 A and M-225 Acute HQs and HI for ATK Ranch Pond with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	4.9E-03	180,000	2.7E-08		2.5E-03	1.4E-08	2.5E-03	1.4E-08
Xylene, m-	108-38-3	7.1E-03	22,000	3.2E-07		3.6E-03	1.6E-07	3.6E-03	1.6E-07
Xylene, o-	95-47-6	8.4E-03	22,000	3.8E-07		4.2E-03	1.9E-07	4.2E-03	1.9E-07
Xylene, p-	106-42-3	7.1E-03	22,000	3.2E-07		3.6E-03	1.6E-07	3.6E-03	1.6E-07
Zinc	7440-66-6	3.0E-02	1,900	1.6E-05		1.5E-02	8.0E-06	1.5E-02	8.0E-06
			Total	**0.2**		**Total**	**0.1**	**With adjusted Ni & Cr**	**2.9E-02**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	4.9E-03	690,000	7.0E-09		2.4E-03	3.5E-09	2.4E-03	3.5E-09
1,2,4-Trimethylbenzene	95-63-6	2.9E-01	690,000	4.2E-07		1.4E-01	2.1E-07	1.4E-01	2.1E-07
1,4-Diethylbenzene	105-05-5	7.7E-03	12,000	6.4E-07		3.9E-03	3.2E-07	3.9E-03	3.2E-07
1-Butene	106-98-9	2.5E-01	1,200,000	2.1E-07		1.3E-01	1.1E-07	1.3E-01	1.1E-07
1-Chloronapthalene	90-13-1	6.3E-03	4,600	1.4E-06		3.2E-03	6.9E-07	3.2E-03	6.9E-07
1-Naphthylamine	134-32-7	1.3E-01	210	6.1E-04		6.3E-02	3.0E-04	6.3E-02	3.0E-04
2,2,4-Trimethylpentane	540-84-1	2.8E-01	14,000,000	2.0E-08		1.4E-01	9.9E-09	1.4E-01	9.9E-09
2,2-Dimethylbutane	75-83-2	1.6E-02	1,800,000	9.0E-09		8.1E-03	4.5E-09	8.1E-03	4.5E-09
2,3,4-Trimethylpentane	565-75-3	9.5E-02	14,000,000	6.8E-09		4.7E-02	3.4E-09	4.7E-02	3.4E-09
2,3-Dimethylbutane	79-29-8	4.0E-02	1,800,000	2.2E-08		2.0E-02	1.1E-08	2.0E-02	1.1E-08
2,3-Dimethylpentane	565-59-3	1.6E-01	1,800,000	9.0E-08		8.1E-02	4.5E-08	8.1E-02	4.5E-08
2,4-Dimethylpentane	108-08-7	6.0E-02	180,000	3.3E-07		3.0E-02	1.7E-07	3.0E-02	1.7E-07
2,5-Dimethylbenzaldehyde	5779-94-2	3.1E-01	17,000	1.8E-05		1.6E-01	9.2E-06	1.6E-01	9.2E-06
2,6-Dichlorophenol	87-65-0	6.3E-03	8,800	7.2E-07		3.2E-03	3.6E-07	3.2E-03	3.6E-07
2-Ethyltoluene	611-14-3	5.2E-03	12,000	4.3E-07		2.6E-03	2.2E-07	2.6E-03	2.2E-07
2-Hexanone	591-78-6	2.3E-02	41,000	5.6E-07		1.2E-02	2.8E-07	1.2E-02	2.8E-07
2-Methylhexane	591-76-4	2.0E-01	1,800,000	1.1E-07		9.8E-02	5.4E-08	9.8E-02	5.4E-08
2-Methylnaphthalene	91-57-6	8.6E-02	3,000	2.9E-05		4.3E-02	1.4E-05	4.3E-02	1.4E-05
2-Methylpentane	107-83-5	1.3E-01	1,800,000	7.1E-08		6.3E-02	3.5E-08	6.3E-02	3.5E-08
2-Naphthylamine	91-59-8	1.3E-01	320	4.0E-04		6.3E-02	2.0E-04	6.3E-02	2.0E-04
3-Ethyltoluene	620-14-4	5.5E-02	12,000	4.6E-06		2.8E-02	2.3E-06	2.8E-02	2.3E-06
3-Methylheptane	589-81-1	4.0E-02	1,400,000	2.9E-08		2.0E-02	1.4E-08	2.0E-02	1.4E-08
3-Methylhexane	589-34-4	2.5E-01	1,800,000	1.4E-07		1.3E-01	7.0E-08	1.3E-01	7.0E-08
3-Methylpentane	96-14-0	8.2E-02	1,800,000	4.6E-08		4.1E-02	2.3E-08	4.1E-02	2.3E-08
4,6-Dinitro-2-methylphenol	534-52-1	1.1E-01	200	5.5E-04		5.5E-02	2.7E-04	5.5E-02	2.7E-04
4-Aminobyphenyl	92-67-1	1.3E-01	490	2.6E-04		6.3E-02	1.3E-04	6.3E-02	1.3E-04
4-Ethyltoluene	622-96-8	6.1E-02	12,000	5.1E-06		3.1E-02	2.5E-06	3.1E-02	2.5E-06
Acenaphthene	83-32-9	6.3E-03	3,600	1.8E-06		3.2E-03	8.8E-07	3.2E-03	8.8E-07
Acenaphthylene	208-96-8	3.6E-02	10,000	3.6E-06		1.8E-02	1.8E-06	1.8E-02	1.8E-06
Acetaldehyde	75-07-0	1.1E+00	470	2.3E-03		5.4E-01	1.1E-03	5.4E-01	1.1E-03
Acetone	67-64-1	2.8E-01	470,000	5.9E-07		1.4E-01	2.9E-07	1.4E-01	2.9E-07
Acetonitrile	75-05-8	2.2E-01	22,000	1.0E-05		1.1E-01	5.0E-06	1.1E-01	5.0E-06
Acetophenone	98-86-2	3.1E-02	10,000	3.1E-06		1.5E-02	1.5E-06	1.5E-02	1.5E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acrylonitrile	107-13-1	1.8E-01	10,000	1.8E-05		9.2E-02	9.2E-06	9.2E-02	9.2E-06
Aluminum	7429-90-5	4.6E+02	3,000	1.5E-01		2.3E+02	7.6E-02	2.3E+02	7.6E-02
Aniline	62-53-3	9.2E-02	30,000	3.1E-06		4.6E-02	1.5E-06	4.6E-02	1.5E-06
Anthracene	120-12-7	1.5E-03	270	5.6E-06		7.5E-04	2.8E-06	7.5E-04	2.8E-06
Antimony	7440-36-0	3.3E-01	500	6.7E-04		1.7E-01	3.3E-04	1.7E-01	3.3E-04
Arsenic	7440-38-2	6.3E-03	0.20	3.1E-02		3.1E-03	1.6E-02	3.1E-03	1.6E-02
Barium	7440-39-3	4.5E-03	1,500	3.0E-06		2.2E-03	1.5E-06	2.2E-03	1.5E-06
Benzaldehyde	100-52-7	4.4E-01	17,000	2.6E-05		2.2E-01	1.3E-05	2.2E-01	1.3E-05
Benzene	71-43-2	1.4E+00	27	5.1E-02		6.9E-01	2.6E-02	6.9E-01	2.6E-02
Benzo(a)anthracene	56-55-3	6.7E-03	1,200	5.6E-06		3.4E-03	2.8E-06	3.4E-03	2.8E-06
Benzo(a)pyrene	50-32-8	8.8E-04	600	1.5E-06		4.4E-04	7.4E-07	4.4E-04	7.4E-07
Benzo(b)fluoranthene	205-99-2	1.3E-02	31	4.3E-04		6.6E-03	2.1E-04	6.6E-03	2.1E-04
Benzo(g,h,i)perylene	191-24-2	5.2E-03	30,000	1.7E-07		2.6E-03	8.6E-08	2.6E-03	8.6E-08
Benzo(k)fluoranthene	207-08-9	1.3E-02	19	7.0E-04		6.6E-03	3.5E-04	6.6E-03	3.5E-04
Benzoic acid	65-85-0	7.2E-01	2,800	2.6E-04		3.6E-01	1.3E-04	3.6E-01	1.3E-04
Benzyl alcohol	100-51-6	9.0E-03	130,000	6.9E-08		4.5E-03	3.4E-08	4.5E-03	3.4E-08
Benzyl chloride	100-44-7	6.6E-03	240	2.7E-05		3.3E-03	1.4E-05	3.3E-03	1.4E-05
Bis(2-chlorethyl)ether	111-44-4	7.1E-03	58,000	1.2E-07		3.5E-03	6.1E-08	3.5E-03	6.1E-08
Bis(2-chloroethoxy)methane	111-91-1	6.3E-03	920	6.9E-06		3.2E-03	3.4E-06	3.2E-03	3.4E-06
Bromodichloromethane	75-27-4	9.0E-03	260	3.5E-05		4.5E-03	1.7E-05	4.5E-03	1.7E-05
Bromoform	75-25-2	1.5E-02	15,000	1.0E-06		7.5E-03	5.0E-07	7.5E-03	5.0E-07
Bromophenyl-phenylether, 4-	101-55-3	6.3E-03	290	2.2E-05		3.2E-03	1.1E-05	3.2E-03	1.1E-05
Butylbenzylphthalate	85-68-7	1.7E-03	15,000	1.2E-07		8.6E-04	5.8E-08	8.6E-04	5.8E-08
Cadmium	7440-43-9	5.4E-04	100	5.4E-06		2.7E-04	2.7E-06	2.7E-04	2.7E-06
Carbazole	86-74-8	8.1E-03	660	1.2E-05		4.0E-03	6.1E-06	4.0E-03	6.1E-06
Carbon disulfide	75-15-0	1.1E-01	6,200	1.8E-05		5.6E-02	9.1E-06	5.6E-02	9.1E-06
Carbon tetrachloride	56-23-5	1.7E-01	1,900	9.1E-05		8.6E-02	4.6E-05	8.6E-02	4.6E-05
Chlorine	7782-50-5	1.4E+02	210	6.5E-01		6.8E+01	3.2E-01	6.8E+01	3.2E-01
Chloro-3-methylphenol, 4-	59-50-7	7.8E-03	5,500	1.4E-06		3.9E-03	7.1E-07	3.9E-03	7.1E-07
Chloroacetonitrile	107-14-2	1.3E-02	9,000	1.4E-06		6.3E-03	7.0E-07	6.3E-03	7.0E-07
Chloroaniline, p-	106-47-8	1.8E-03	2,200	8.1E-07		8.9E-04	4.1E-07	8.9E-04	4.1E-07
Chlorobenzene	108-90-7	2.9E-02	46,000	6.3E-07		1.4E-02	3.1E-07	1.4E-02	3.1E-07
Chloroethane	75-00-3	5.1E-03	260,000	2.0E-08		2.5E-03	9.8E-09	2.5E-03	9.8E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroform (Trichloromethane)	67-66-3	7.0E-02	150	4.7E-04		3.5E-02	2.3E-04	3.5E-02	2.3E-04
Chloronaphthalene,2-	91-58-7	6.3E-03	600	1.1E-05		3.2E-03	5.3E-06	3.2E-03	5.3E-06
Chlorophenol, 2-	95-57-8	2.2E-02	1,300	1.7E-05		1.1E-02	8.5E-06	1.1E-02	8.5E-06
Chromium III	7440-47-3	1.3E-01	1,500	8.4E-05		6.3E-02	4.2E-05	3.1E-03	2.1E-06
Chromium, hexavalent	18540-29-9	1.0E-01	89	1.2E-03		5.1E-02	5.8E-04	2.6E-03	2.9E-05
Chrysene	218-01-9	8.3E-03	600	1.4E-05		4.2E-03	6.9E-06	4.2E-03	6.9E-06
Cis-1,3-dichloropropene	10062-01-5	1.5E-02	600	2.5E-05		7.5E-03	1.2E-05	7.5E-03	1.2E-05
cis-2-Butene	590-18-1	2.0E-02	150,000,000	1.3E-10		9.8E-03	6.5E-11	9.8E-03	6.5E-11
Cobalt	7440-48-4	1.4E-03	180	7.6E-06		6.8E-04	3.8E-06	6.8E-04	3.8E-06
Copper	7440-50-8	2.9E-01	100	2.9E-03		1.4E-01	1.4E-03	1.4E-01	1.4E-03
Cresol, m-	108-39-4	1.5E-03	20,000	7.4E-08		7.4E-04	3.7E-08	7.4E-04	3.7E-08
Cresol, o-	95-48-7	3.8E-02	20,000	1.9E-06		1.9E-02	9.5E-07	1.9E-02	9.5E-07
Cresol, p-	106-44-5	1.5E-03	20,000	7.4E-08		7.4E-04	3.7E-08	7.4E-04	3.7E-08
Crotonaldehyde	4170-30-3	3.7E-02	540	6.8E-05		1.8E-02	3.4E-05	1.8E-02	3.4E-05
Cumene	98-82-8	4.9E-03	250,000	1.9E-08		2.4E-03	9.7E-09	2.4E-03	9.7E-09
Cyclohexane	110-82-7	2.9E-02	340,000	8.5E-08		1.4E-02	4.2E-08	1.4E-02	4.2E-08
Dibenz(a,h)anthracene	53-70-3	1.2E-03	34	3.4E-05		5.8E-04	1.7E-05	5.8E-04	1.7E-05
Dibenzofuran	132-64-9	6.3E-03	30,000	2.1E-07		3.2E-03	1.1E-07	3.2E-03	1.1E-07
Dibromochloromethane	124-48-1	1.0E-02	7,400	1.4E-06		5.1E-03	6.9E-07	5.1E-03	6.9E-07
Dichlorobenzene, 1,2-	95-50-1	6.5E-03	300,000	2.2E-08		3.2E-03	1.1E-08	3.2E-03	1.1E-08
Dichlorobenzene, 1,3-	541-73-1	7.2E-03	16,000	4.5E-07		3.6E-03	2.2E-07	3.6E-03	2.2E-07
Dichlorobenzene,1,4-	106-46-7	6.7E-03	60,000	1.1E-07		3.3E-03	5.6E-08	3.3E-03	5.6E-08
Dichloroethane 1,1-	75-34-3	3.7E-03	650,000	5.7E-09		1.8E-03	2.8E-09	1.8E-03	2.8E-09
Dichloroethane, 1,2	107-06-2	6.2E-03	200,000	3.1E-08		3.1E-03	1.6E-08	3.1E-03	1.6E-08
Dichloroethylene 1,1-	75-35-4	5.0E-03	180,000	2.8E-08		2.5E-03	1.4E-08	2.5E-03	1.4E-08
Dichloroethylene, cis-1,2-	156-59-2	1.4E-03	560,000	2.5E-09		6.9E-04	1.2E-09	6.9E-04	1.2E-09
Dichloroethylene-1,2 (trans)	156-60-5	8.3E-03	1,100,000	7.6E-09		4.2E-03	3.8E-09	4.2E-03	3.8E-09
Dichlorophenol, 2,4-	120-83-2	1.1E-02	1,300	8.2E-06		5.3E-03	4.1E-06	5.3E-03	4.1E-06
Dichloropropane, 1,2-	78-87-5	4.3E-03	140,000	3.1E-08		2.1E-03	1.5E-08	2.1E-03	1.5E-08
Diethyl phthalate	84-66-2	9.2E-03	5,000	1.8E-06		4.6E-03	9.2E-07	4.6E-03	9.2E-07
Dimethyl phthalate	131-11-3	6.3E-03	15,000	4.2E-07		3.2E-03	2.1E-07	3.2E-03	2.1E-07
Dimethylphenol, 2,4-	105-67-9	8.0E-02	4,500	1.8E-05		4.0E-02	8.8E-06	4.0E-02	8.8E-06
Di-n-butyl phthalate	84-74-2	1.3E-01	15,000	8.5E-06		6.3E-02	4.2E-06	6.3E-02	4.2E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dinitrobenzene, 1,3-	99-65-0	6.6E-03	1,000	6.6E-06		3.3E-03	3.3E-06	3.3E-03	3.3E-06
Dinitrophenol, 2,4-	51-28-5	2.8E-01	220	1.3E-03		1.4E-01	6.3E-04	1.4E-01	6.3E-04
Dinitrotoluene, 2,4-	121-14-2	6.3E-03	600	1.1E-05		3.2E-03	5.3E-06	3.2E-03	5.3E-06
Dinitrotoluene, 2,6-	606-20-2	6.5E-03	600	1.1E-05		3.2E-03	5.4E-06	3.2E-03	5.4E-06
Di-n-octylphthalate	117-84-0	4.3E-02	6,800	6.3E-06		2.1E-02	3.1E-06	2.1E-02	3.1E-06
Dioxane, 1,4-	123-91-1	7.4E-03	3,000	2.5E-06		3.7E-03	1.2E-06	3.7E-03	1.2E-06
Diphenylamine	122-39-4	6.3E-03	30,000	2.1E-07		3.2E-03	1.1E-07	3.2E-03	1.1E-07
Ethyl methacrylate	97-63-2	1.8E-02	13,000	1.4E-06		9.2E-03	7.1E-07	9.2E-03	7.1E-07
Ethylbenzene	100-41-4	1.3E-01	140,000	9.1E-07		6.3E-02	4.5E-07	6.3E-02	4.5E-07
Ethylene Dibromide	106-93-4	1.0E-02	130,000	7.9E-08		5.1E-03	3.9E-08	5.1E-03	3.9E-08
Ethylether	60-29-7	2.9E-02	1,500,000	1.9E-08		1.4E-02	9.6E-09	1.4E-02	9.6E-09
Ethylhexyl phthalate, bis-2-	117-81-7	1.3E-02	10,000	1.3E-06		6.7E-03	6.7E-07	6.7E-03	6.7E-07
Fluoranthene	206-44-0	3.0E-02	1,500	2.0E-05		1.5E-02	1.0E-05	1.5E-02	1.0E-05
Fluorene	86-73-7	7.5E-03	6,600	1.1E-06		3.8E-03	5.7E-07	3.8E-03	5.7E-07
Formaldehyde	50-00-0	5.4E-01	55	9.9E-03		2.7E-01	4.9E-03	2.7E-01	4.9E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	3.3E-07	3	1.1E-07		1.7E-07	5.5E-08	1.7E-07	5.5E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	8.4E-06	45	1.9E-07		4.2E-06	9.3E-08	4.2E-06	9.3E-08
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	2.2E-06	60	3.6E-08		1.1E-06	1.8E-08	1.1E-06	1.8E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	4.0E-08	0.07	5.4E-07		2.0E-08	2.7E-07	2.0E-08	2.7E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.0E-07	0.75	1.4E-07		5.1E-08	6.8E-08	5.1E-08	6.8E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	7.0E-08	4	1.8E-08		3.5E-08	9.0E-09	3.5E-08	9.0E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	3.0E-06	0.07	4.0E-05		1.5E-06	2.0E-05	1.5E-06	2.0E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.8E-06	0.04	5.0E-05		9.2E-07	2.5E-05	9.2E-07	2.5E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.4E-06	30	4.6E-08		6.9E-07	2.3E-08	6.9E-07	2.3E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	2.2E-06	0.49	4.5E-06		1.1E-06	2.2E-06	1.1E-06	2.2E-06
Hexachloro-1,3-butadiene	87-68-3	9.4E-03	11,000	8.5E-07		4.7E-03	4.2E-07	4.7E-03	4.2E-07
Hexachlorobenzene	118-74-1	5.4E-02	6	9.0E-03		2.7E-02	4.5E-03	2.7E-02	4.5E-03
Hexachlorocyclopentadiene	77-47-4	1.3E-01	110	1.2E-03		6.3E-02	5.8E-04	6.3E-02	5.8E-04
Hexachloroethane (Perchloroethane)	67-72-1	6.8E-03	29,000	2.4E-07		3.4E-03	1.2E-07	3.4E-03	1.2E-07
Hexachloropropene	1888-71-7	9.1E-03	905	1.0E-05		4.5E-03	5.0E-06	4.5E-03	5.0E-06
Hexane	110-54-3	1.1E-01	1,100,000	1.0E-07		5.6E-02	5.1E-08	5.6E-02	5.1E-08
Hydrogen chloride	7647-01-0	2.1E+02	2,100	9.8E-02		1.0E+02	4.9E-02	1.0E+02	4.9E-02
Indeno(1,2,3-cd) pyrene	193-39-5	4.5E-03	15	3.0E-04		2.3E-03	1.5E-04	2.3E-03	1.5E-04

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Isophorone	78-59-1	6.3E-03	23,000	2.8E-07		3.2E-03	1.4E-07	3.2E-03	1.4E-07
Lead	7439-92-1	4.7E-01	150	3.1E-03		2.3E-01	1.6E-03	2.3E-01	1.6E-03
Manganese	7439-96-5	1.1E+00	3,000	3.6E-04		5.4E-01	1.8E-04	5.4E-01	1.8E-04
Mercuric chloride	7487-94-7	6.1E-05	2,700	2.3E-08		3.1E-05	1.1E-08	3.1E-05	1.1E-08
Methacrylonitrile	126-98-7	6.8E-02	2,700	2.5E-05		3.4E-02	1.3E-05	3.4E-02	1.3E-05
Methyl bromide	74-83-9	1.4E-03	3,900	3.6E-07		6.9E-04	1.8E-07	6.9E-04	1.8E-07
Methyl chloride	74-87-3	1.6E-01	210,000	7.7E-07		8.1E-02	3.8E-07	8.1E-02	3.8E-07
Methyl ethyl ketone	78-93-3	4.5E-02	13,000	3.5E-06		2.2E-02	1.7E-06	2.2E-02	1.7E-06
Methyl isobutyl ketone	108-10-1	9.5E-03	310,000	3.1E-08		4.7E-03	1.5E-08	4.7E-03	1.5E-08
Methyl tert-butyl ether	1634-04-4	1.5E-01	180,000	8.3E-07		7.5E-02	4.2E-07	7.5E-02	4.2E-07
Methylcyclohexane	108-87-2	1.4E-01	1,600,000	8.7E-08		6.9E-02	4.3E-08	6.9E-02	4.3E-08
Methylene chloride	75-09-2	2.8E+00	14,000	2.0E-04		1.4E+00	9.9E-05	1.4E+00	9.9E-05
Methylmethacrylate	80-62-6	1.8E-02	70,000	2.6E-07		9.2E-03	1.3E-07	9.2E-03	1.3E-07
Naphthalene	91-20-3	1.1E+00	79,000	1.3E-05		5.3E-01	6.7E-06	5.3E-01	6.7E-06
Nickel	7440-02-0	6.6E-01	0.20	3.3E+00		3.3E-01	1.7E+00	5.7E-03	2.9E-02
Nitroaniline, 2-	88-74-4	6.3E-03	4,800	1.3E-06		3.2E-03	6.6E-07	3.2E-03	6.6E-07
Nitroaniline, 3-	99-09-2	2.5E-02	110	2.3E-04		1.3E-02	1.1E-04	1.3E-02	1.1E-04
Nitroaniline, 4-	100-01-6	2.5E-02	9,000	2.8E-06		1.3E-02	1.4E-06	1.3E-02	1.4E-06
Nitrobenzene	98-95-3	7.2E-03	9,100	7.9E-07		3.6E-03	4.0E-07	3.6E-03	4.0E-07
Nitrophenol, 2-	88-75-5	5.4E-02	1,000	5.4E-05		2.7E-02	2.7E-05	2.7E-02	2.7E-05
Nitrophenol, 4-	100-02-7	4.2E-02	1,200	3.5E-05		2.1E-02	1.7E-05	2.1E-02	1.7E-05
Nitroso-di-n-butylamine, n-	924-16-3	6.3E-03	2,000	3.2E-06		3.2E-03	1.6E-06	3.2E-03	1.6E-06
Nitrosodiphenylamine, N-	86-30-6	1.1E-03	1,400	8.0E-07		5.6E-04	4.0E-07	5.6E-04	4.0E-07
Nitrosodipropylamine, n-	621-64-7	6.3E-03	2,000	3.2E-06		3.2E-03	1.6E-06	3.2E-03	1.6E-06
n-Nitrosodiethylamine	55-18-5	6.3E-03	1,700	3.7E-06		3.2E-03	1.9E-06	3.2E-03	1.9E-06
n-Nitrosodimethylamine	62-75-9	6.4E-03	1,700	3.8E-06		3.2E-03	1.9E-06	3.2E-03	1.9E-06
n-Nitrosomethylethylamine	10595-95-6	1.1E-02	1,700	6.2E-06		5.2E-03	3.1E-06	5.2E-03	3.1E-06
n-Nitrosomorpholine	59-89-2	6.3E-03	74	8.6E-05		3.2E-03	4.3E-05	3.2E-03	4.3E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	4.2E-07	3	1.4E-07		2.1E-07	7.1E-08	2.1E-07	7.1E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	6.1E-06	75	8.1E-08		3.0E-06	4.0E-08	3.0E-06	4.0E-08
o-Tolualdehyde	529-20-4	4.6E-01	17,000	2.7E-05		2.3E-01	1.4E-05	2.3E-01	1.4E-05
p-Dimethylaminoazobenzene	60-11-7	6.3E-03	670	9.4E-06		3.1E-03	4.7E-06	3.1E-03	4.7E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	7.7E-08	0.10	7.7E-07		3.8E-08	3.8E-07	3.8E-08	3.8E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
PentaCDF, 1,2,3,7,8-	57117-41-6	9.2E-07	0.24	3.8E-06		4.6E-07	1.9E-06	4.6E-07	1.9E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	1.8E-06	0.07	2.5E-05		9.2E-07	1.2E-05	9.2E-07	1.2E-05
Pentachlorobenzene	608-93-5	6.3E-03	1,600	4.0E-06		3.2E-03	2.0E-06	3.2E-03	2.0E-06
Pentachloroethane	76-01-7	8.1E-03	320,000	2.5E-08		4.0E-03	1.3E-08	4.0E-03	1.3E-08
Pentachloronitrobenzene	82-68-8	6.7E-03	1,500	4.5E-06		3.3E-03	2.2E-06	3.3E-03	2.2E-06
Pentachlorophenol	87-86-5	3.2E-01	1,400	2.3E-04		1.6E-01	1.1E-04	1.6E-01	1.1E-04
Perchlorate	14797-73-0	5.6E-03	23	2.4E-04		2.8E-03	1.2E-04	2.8E-03	1.2E-04
Phenanthrene	85-01-8	3.7E-02	760	4.8E-05		1.8E-02	2.4E-05	1.8E-02	2.4E-05
Phenol	108-95-2	3.4E-02	5,800	5.9E-06		1.7E-02	3.0E-06	1.7E-02	3.0E-06
Phosphorous	7723-14-0	1.3E+00	270	4.7E-03		6.3E-01	2.3E-03	6.3E-01	2.3E-03
Propanal	123-38-6	6.0E-01	110,000	5.5E-06		3.0E-01	2.7E-06	3.0E-01	2.7E-06
Propylbenzene	103-65-1	5.3E-02	5,400	9.8E-06		2.7E-02	4.9E-06	2.7E-02	4.9E-06
Propylene	115-07-1	5.7E-01	860,000	6.6E-07		2.8E-01	3.3E-07	2.8E-01	3.3E-07
Pyrene	129-00-0	2.6E-02	150	1.7E-04		1.3E-02	8.6E-05	1.3E-02	8.6E-05
Pyridine	110-86-1	9.4E-03	9,700	9.7E-07		4.7E-03	4.8E-07	4.7E-03	4.8E-07
Selenium	7782-49-2	1.8E-02	200	9.1E-05		9.1E-03	4.6E-05	9.1E-03	4.6E-05
Silver	7440-22-4	1.4E-02	100	1.4E-04		6.8E-03	6.8E-05	6.8E-03	6.8E-05
Styrene	100-42-5	1.5E-02	21,000	7.2E-07		7.5E-03	3.6E-07	7.5E-03	3.6E-07
TetraCDD, 2,3,7,8-	1746-01-6	2.7E-08	0.00003	8.8E-04		1.3E-08	4.4E-04	1.3E-08	4.4E-04
TetraCDF, 2,3,7,8-	51207-31-9	4.6E-07	0.07	6.2E-06		2.3E-07	3.1E-06	2.3E-07	3.1E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	6.3E-03	240	2.6E-05		3.2E-03	1.3E-05	3.2E-03	1.3E-05
Tetrachloroethane, 1,1,2,2-	79-34-5	4.9E-03	7,000	6.9E-07		2.4E-03	3.5E-07	2.4E-03	3.5E-07
Tetrachloroethylene	127-18-4	2.9E-02	20,000	1.4E-06		1.4E-02	7.2E-07	1.4E-02	7.2E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	8.2E-03	1,300	6.3E-06		4.1E-03	3.2E-06	4.1E-03	3.2E-06
Tetrahydrofuran	109-99-9	1.0E-02	290,000	3.6E-08		5.2E-03	1.8E-08	5.2E-03	1.8E-08
Toluene	108-88-3	3.2E-01	37,000	8.7E-06		1.6E-01	4.4E-06	1.6E-01	4.4E-06
Toluidine, o-	95-53-4	8.1E-02	8,800	9.2E-06		4.0E-02	4.6E-06	4.0E-02	4.6E-06
Trans-1,3-dichloropropene	10061-02-6	7.0E-03	75,000	9.4E-08		3.5E-03	4.7E-08	3.5E-03	4.7E-08
trans-2-Butene	624-64-6	8.9E-02	1,000,000	8.9E-08		4.4E-02	4.4E-08	4.4E-02	4.4E-08
Trichlorobenzene, 1,2,4-	120-82-1	7.5E-03	3,400	2.2E-06		3.7E-03	1.1E-06	3.7E-03	1.1E-06
Trichloroethane, 1,1,1-	71-55-6	3.1E-03	1,300,000	2.4E-09		1.6E-03	1.2E-09	1.6E-03	1.2E-09
Trichloroethane, 1,1,2-	79-00-5	8.4E-03	81,000	1.0E-07		4.2E-03	5.2E-08	4.2E-03	5.2E-08
Trichloroethylene	79-01-6	1.1E-02	700,000	1.6E-08		5.4E-03	7.7E-09	5.4E-03	7.7E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Trichlorophenol, 2,4,5-	95-95-4	1.6E-02	7,400	2.2E-06		8.2E-03	1.1E-06	8.2E-03	1.1E-06
Trichlorophenol, 2,4,6-	88-06-2	1.5E-02	1,800	8.4E-06		7.6E-03	4.2E-06	7.6E-03	4.2E-06
Trimethylbenzene, 1,3,5-	108-67-8	2.2E-01	690,000	3.2E-07		1.1E-01	1.6E-07	1.1E-01	1.6E-07
Trinitrobenzene, 1,3,5	99-35-4	6.3E-03	530	1.2E-05		3.2E-03	6.0E-06	3.2E-03	6.0E-06
Undecane	1120-21-4	1.4E-01	1,500	9.2E-05		6.9E-02	4.6E-05	6.9E-02	4.6E-05
Vinyl Chloride	75-01-4	8.8E-02	180,000	4.9E-07		4.4E-02	2.4E-07	4.4E-02	2.4E-07
Xylene, m-	108-38-3	1.3E-01	22,000	5.8E-06		6.3E-02	2.9E-06	6.3E-02	2.9E-06
Xylene, o-	95-47-6	1.5E-01	22,000	6.8E-06		7.5E-02	3.4E-06	7.5E-02	3.4E-06
Xylene, p-	106-42-3	1.3E-01	22,000	5.8E-06		6.3E-02	2.9E-06	6.3E-02	2.9E-06
Zinc	7440-66-6	6.4E-01	1,900	3.4E-04		3.2E-01	1.7E-04	3.2E-01	1.7E-04
			Total	**4.3**		**Total**	**2.2**	**With adjusted Ni & Cr**	**0.5**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	5.3E-03	690,000	7.6E-09		2.6E-03	3.8E-09	2.6E-03	3.8E-09
1,2,4-Trimethylbenzene	95-63-6	3.1E-01	690,000	4.6E-07		1.6E-01	2.3E-07	1.6E-01	2.3E-07
1,4-Diethylbenzene	105-05-5	8.4E-03	12,000	7.0E-07		4.2E-03	3.5E-07	4.2E-03	3.5E-07
1-Butene	106-98-9	2.8E-01	1,200,000	2.3E-07		1.4E-01	1.1E-07	1.4E-01	1.1E-07
1-Chloronapthalene	90-13-1	6.9E-03	4,600	1.5E-06		3.4E-03	7.5E-07	3.4E-03	7.5E-07
1-Naphthylamine	134-32-7	1.4E-01	210	6.6E-04		6.9E-02	3.3E-04	6.9E-02	3.3E-04
2,2,4-Trimethylpentane	540-84-1	3.0E-01	14,000,000	2.2E-08		1.5E-01	1.1E-08	1.5E-01	1.1E-08
2,2-Dimethylbutane	75-83-2	1.8E-02	1,800,000	9.8E-09		8.8E-03	4.9E-09	8.8E-03	4.9E-09
2,3,4-Trimethylpentane	565-75-3	1.0E-01	14,000,000	7.4E-09		5.1E-02	3.7E-09	5.1E-02	3.7E-09
2,3-Dimethylbutane	79-29-8	4.4E-02	1,800,000	2.4E-08		2.2E-02	1.2E-08	2.2E-02	1.2E-08
2,3-Dimethylpentane	565-59-3	1.8E-01	1,800,000	9.8E-08		8.8E-02	4.9E-08	8.8E-02	4.9E-08
2,4-Dimethylpentane	108-08-7	6.5E-02	180,000	3.6E-07		3.3E-02	1.8E-07	3.3E-02	1.8E-07
2,5-Dimethylbenzaldehyde	5779-94-2	3.4E-01	17,000	2.0E-05		1.7E-01	1.0E-05	1.7E-01	1.0E-05
2,6-Dichlorophenol	87-65-0	6.9E-03	8,800	7.8E-07		3.4E-03	3.9E-07	3.4E-03	3.9E-07
2-Ethyltoluene	611-14-3	5.7E-03	12,000	4.7E-07		2.8E-03	2.4E-07	2.8E-03	2.4E-07
2-Hexanone	591-78-6	2.5E-02	41,000	6.1E-07		1.3E-02	3.1E-07	1.3E-02	3.1E-07
2-Methylhexane	591-76-4	2.1E-01	1,800,000	1.2E-07		1.1E-01	5.9E-08	1.1E-01	5.9E-08
2-Methylnaphthalene	91-57-6	9.4E-02	3,000	3.1E-05		4.7E-02	1.6E-05	4.7E-02	1.6E-05
2-Methylpentane	107-83-5	1.4E-01	1,800,000	7.7E-08		6.9E-02	3.8E-08	6.9E-02	3.8E-08
2-Naphthylamine	91-59-8	1.4E-01	320	4.3E-04		6.9E-02	2.2E-04	6.9E-02	2.2E-04
3-Ethyltoluene	620-14-4	6.0E-02	12,000	5.0E-06		3.0E-02	2.5E-06	3.0E-02	2.5E-06
3-Methylheptane	589-81-1	4.4E-02	1,400,000	3.1E-08		2.2E-02	1.6E-08	2.2E-02	1.6E-08
3-Methylhexane	589-34-4	2.8E-01	1,800,000	1.5E-07		1.4E-01	7.7E-08	1.4E-01	7.7E-08
3-Methylpentane	96-14-0	8.9E-02	1,800,000	5.0E-08		4.5E-02	2.5E-08	4.5E-02	2.5E-08
4,6-Dinitro-2-methylphenol	534-52-1	1.2E-01	200	6.0E-04		6.0E-02	3.0E-04	6.0E-02	3.0E-04
4-Aminobyphenyl	92-67-1	1.4E-01	490	2.8E-04		6.9E-02	1.4E-04	6.9E-02	1.4E-04
4-Ethyltoluene	622-96-8	6.7E-02	12,000	5.5E-06		3.3E-02	2.8E-06	3.3E-02	2.8E-06
Acenaphthene	83-32-9	6.9E-03	3,600	1.9E-06		3.4E-03	9.5E-07	3.4E-03	9.5E-07
Acenaphthylene	208-96-8	3.9E-02	10,000	3.9E-06		1.9E-02	1.9E-06	1.9E-02	1.9E-06

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	1.2E+00	470	2.5E-03		5.8E-01	1.2E-03	5.8E-01	1.2E-03
Acetone	67-64-1	3.0E-01	470,000	6.4E-07		1.5E-01	3.2E-07	1.5E-01	3.2E-07
Acetonitrile	75-05-8	2.4E-01	22,000	1.1E-05		1.2E-01	5.4E-06	1.2E-01	5.4E-06
Acetophenone	98-86-2	3.4E-02	10,000	3.4E-06		1.7E-02	1.7E-06	1.7E-02	1.7E-06
Acrylonitrile	107-13-1	2.0E-01	10,000	2.0E-05		1.0E-01	1.0E-05	1.0E-01	1.0E-05
Aluminum	7429-90-5	5.0E+02	3,000	1.7E-01		2.5E+02	8.3E-02	2.5E+02	8.3E-02
Aniline	62-53-3	1.0E-01	30,000	3.3E-06		5.0E-02	1.7E-06	5.0E-02	1.7E-06
Anthracene	120-12-7	1.6E-03	270	6.0E-06		8.1E-04	3.0E-06	8.1E-04	3.0E-06
Antimony	7440-36-0	3.6E-01	500	7.3E-04		1.8E-01	3.6E-04	1.8E-01	3.6E-04
Arsenic	7440-38-2	6.9E-03	0.20	3.4E-02		3.4E-03	1.7E-02	3.4E-03	1.7E-02
Barium	7440-39-3	4.9E-03	1,500	3.2E-06		2.4E-03	1.6E-06	2.4E-03	1.6E-06
Benzaldehyde	100-52-7	4.8E-01	17,000	2.8E-05		2.4E-01	1.4E-05	2.4E-01	1.4E-05
Benzene	71-43-2	1.5E+00	27	5.6E-02		7.5E-01	2.8E-02	7.5E-01	2.8E-02
Benzo(a)anthracene	56-55-3	7.3E-03	1,200	6.1E-06		3.7E-03	3.1E-06	3.7E-03	3.1E-06
Benzo(a)pyrene	50-32-8	9.6E-04	600	1.6E-06		4.8E-04	8.0E-07	4.8E-04	8.0E-07
Benzo(b)fluoranthene	205-99-2	1.4E-02	31	4.7E-04		7.2E-03	2.3E-04	7.2E-03	2.3E-04
Benzo(g,h,i)perylene	191-24-2	5.7E-03	30,000	1.9E-07		2.8E-03	9.4E-08	2.8E-03	9.4E-08
Benzo(k)fluoranthene	207-08-9	1.4E-02	19	7.6E-04		7.2E-03	3.8E-04	7.2E-03	3.8E-04
Benzoic acid	65-85-0	7.8E-01	2,800	2.8E-04		3.9E-01	1.4E-04	3.9E-01	1.4E-04
Benzyl alcohol	100-51-6	9.8E-03	130,000	7.5E-08		4.9E-03	3.7E-08	4.9E-03	3.7E-08
Benzyl chloride	100-44-7	7.2E-03	240	3.0E-05		3.6E-03	1.5E-05	3.6E-03	1.5E-05
Bis(2-chlorethyl)ether	111-44-4	7.7E-03	58,000	1.3E-07		3.8E-03	6.6E-08	3.8E-03	6.6E-08
Bis(2-chloroethoxy)methane	111-91-1	6.9E-03	920	7.5E-06		3.4E-03	3.7E-06	3.4E-03	3.7E-06
Bromodichloromethane	75-27-4	9.8E-03	260	3.8E-05		4.9E-03	1.9E-05	4.9E-03	1.9E-05
Bromoform	75-25-2	1.6E-02	15,000	1.1E-06		8.1E-03	5.4E-07	8.1E-03	5.4E-07
Bromophenyl-phenylether, 4-	101-55-3	6.9E-03	290	2.4E-05		3.4E-03	1.2E-05	3.4E-03	1.2E-05
Butylbenzylphthalate	85-68-7	1.9E-03	15,000	1.3E-07		9.4E-04	6.3E-08	9.4E-04	6.3E-08
Cadmium	7440-43-9	5.9E-04	100	5.9E-06		2.9E-04	2.9E-06	2.9E-04	2.9E-06
Carbazole	86-74-8	8.8E-03	660	1.3E-05		4.4E-03	6.7E-06	4.4E-03	6.7E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	1.2E-01	6,200	2.0E-05		6.1E-02	9.9E-06	6.1E-02	9.9E-06
Carbon tetrachloride	56-23-5	1.9E-01	1,900	9.9E-05		9.4E-02	4.9E-05	9.4E-02	4.9E-05
Chlorine	7782-50-5	1.5E+02	210	7.1E-01		7.4E+01	3.5E-01	7.4E+01	3.5E-01
Chloro-3-methylphenol, 4-	59-50-7	8.5E-03	5,500	1.6E-06		4.3E-03	7.7E-07	4.3E-03	7.7E-07
Chloroacetonitrile	107-14-2	1.4E-02	9,000	1.5E-06		6.9E-03	7.7E-07	6.9E-03	7.7E-07
Chloroaniline, p-	106-47-8	1.9E-03	2,200	8.9E-07		9.7E-04	4.4E-07	9.7E-04	4.4E-07
Chlorobenzene	108-90-7	3.1E-02	46,000	6.8E-07		1.6E-02	3.4E-07	1.6E-02	3.4E-07
Chloroethane	75-00-3	5.5E-03	260,000	2.1E-08		2.8E-03	1.1E-08	2.8E-03	1.1E-08
Chloroform (Trichloromethane)	67-66-3	7.7E-02	150	5.1E-04		3.8E-02	2.5E-04	3.8E-02	2.5E-04
Chloronaphthalene,2-	91-58-7	6.9E-03	600	1.1E-05		3.4E-03	5.7E-06	3.4E-03	5.7E-06
Chlorophenol, 2-	95-57-8	2.4E-02	1,300	1.9E-05		1.2E-02	9.3E-06	1.2E-02	9.3E-06
Chromium III	7440-47-3	1.4E-01	1,500	9.1E-05		6.8E-02	4.6E-05	3.4E-03	2.3E-06
Chromium, hexavalent	18540-29-9	1.1E-01	89	1.3E-03		5.6E-02	6.3E-04	2.8E-03	3.1E-05
Chrysene	218-01-9	9.1E-03	600	1.5E-05		4.5E-03	7.5E-06	4.5E-03	7.5E-06
Cis-1,3-dichloropropene	10062-01-5	1.6E-02	600	2.7E-05		8.1E-03	1.4E-05	8.1E-03	1.4E-05
cis-2-Butene	590-18-1	2.1E-02	150,000,000	1.4E-10		1.1E-02	7.1E-11	1.1E-02	7.1E-11
Cobalt	7440-48-4	1.5E-03	180	8.3E-06		7.5E-04	4.1E-06	7.5E-04	4.1E-06
Copper	7440-50-8	3.1E-01	100	3.1E-03		1.6E-01	1.6E-03	1.6E-01	1.6E-03
Cresol, m-	108-39-4	1.6E-03	20,000	8.1E-08		8.1E-04	4.0E-08	8.1E-04	4.0E-08
Cresol, o-	95-48-7	4.1E-02	20,000	2.1E-06		2.1E-02	1.0E-06	2.1E-02	1.0E-06
Cresol, p-	106-44-5	1.6E-03	20,000	8.1E-08		8.1E-04	4.0E-08	8.1E-04	4.0E-08
Crotonaldehyde	4170-30-3	4.0E-02	540	7.4E-05		2.0E-02	3.7E-05	2.0E-02	3.7E-05
Cumene	98-82-8	5.3E-03	250,000	2.1E-08		2.6E-03	1.1E-08	2.6E-03	1.1E-08
Cyclohexane	110-82-7	3.1E-02	340,000	9.2E-08		1.6E-02	4.6E-08	1.6E-02	4.6E-08
Dibenz(a,h)anthracene	53-70-3	1.3E-03	34	3.8E-05		6.4E-04	1.9E-05	6.4E-04	1.9E-05
Dibenzofuran	132-64-9	6.9E-03	30,000	2.3E-07		3.4E-03	1.1E-07	3.4E-03	1.1E-07
Dibromochloromethane	124-48-1	1.1E-02	7,400	1.5E-06		5.5E-03	7.5E-07	5.5E-03	7.5E-07
Dichlorobenzene, 1,2-	95-50-1	7.0E-03	300,000	2.3E-08		3.5E-03	1.2E-08	3.5E-03	1.2E-08
Dichlorobenzene, 1,3-	541-73-1	7.8E-03	16,000	4.9E-07		3.9E-03	2.4E-07	3.9E-03	2.4E-07

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	7.3E-03	60,000	1.2E-07		3.6E-03	6.1E-08	3.6E-03	6.1E-08
Dichloroethane 1,1-	75-34-3	4.0E-03	650,000	6.2E-09		2.0E-03	3.1E-09	2.0E-03	3.1E-09
Dichloroethane, 1,2	107-06-2	6.8E-03	200,000	3.4E-08		3.4E-03	1.7E-08	3.4E-03	1.7E-08
Dichloroethylene 1,1-	75-35-4	5.4E-03	180,000	3.0E-08		2.7E-03	1.5E-08	2.7E-03	1.5E-08
Dichloroethylene, cis-1,2-	156-59-2	1.5E-03	560,000	2.7E-09		7.5E-04	1.3E-09	7.5E-04	1.3E-09
Dichloroethylene-1,2 (trans)	156-60-5	9.0E-03	1,100,000	8.2E-09		4.5E-03	4.1E-09	4.5E-03	4.1E-09
Dichlorophenol, 2,4-	120-83-2	1.2E-02	1,300	8.9E-06		5.8E-03	4.5E-06	5.8E-03	4.5E-06
Dichloropropane, 1,2-	78-87-5	4.6E-03	140,000	3.3E-08		2.3E-03	1.7E-08	2.3E-03	1.7E-08
Diethyl phthalate	84-66-2	1.0E-02	5,000	2.0E-06		5.0E-03	1.0E-06	5.0E-03	1.0E-06
Dimethyl phthalate	131-11-3	6.9E-03	15,000	4.6E-07		3.4E-03	2.3E-07	3.4E-03	2.3E-07
Dimethylphenol, 2,4-	105-67-9	8.7E-02	4,500	1.9E-05		4.3E-02	9.6E-06	4.3E-02	9.6E-06
Di-n-butyl phthalate	84-74-2	1.4E-01	15,000	9.2E-06		6.9E-02	4.6E-06	6.9E-02	4.6E-06
Dinitrobenzene, 1,3-	99-65-0	7.2E-03	1,000	7.2E-06		3.6E-03	3.6E-06	3.6E-03	3.6E-06
Dinitrophenol, 2,4-	51-28-5	3.0E-01	220	1.4E-03		1.5E-01	6.9E-04	1.5E-01	6.9E-04
Dinitrotoluene, 2,4-	121-14-2	6.9E-03	600	1.1E-05		3.4E-03	5.7E-06	3.4E-03	5.7E-06
Dinitrotoluene, 2,6-	606-20-2	7.1E-03	600	1.2E-05		3.5E-03	5.9E-06	3.5E-03	5.9E-06
Di-n-octylphthalate	117-84-0	4.6E-02	6,800	6.8E-06		2.3E-02	3.4E-06	2.3E-02	3.4E-06
Dioxane, 1,4-	123-91-1	8.0E-03	3,000	2.7E-06		4.0E-03	1.3E-06	4.0E-03	1.3E-06
Diphenylamine	122-39-4	6.9E-03	30,000	2.3E-07		3.4E-03	1.1E-07	3.4E-03	1.1E-07
Ethyl methacrylate	97-63-2	2.0E-02	13,000	1.5E-06		1.0E-02	7.7E-07	1.0E-02	7.7E-07
Ethylbenzene	100-41-4	1.4E-01	140,000	9.9E-07		6.9E-02	4.9E-07	6.9E-02	4.9E-07
Ethylene Dibromide	106-93-4	1.1E-02	130,000	8.6E-08		5.6E-03	4.3E-08	5.6E-03	4.3E-08
Ethylether	60-29-7	3.1E-02	1,500,000	2.1E-08		1.6E-02	1.0E-08	1.6E-02	1.0E-08
Ethylhexyl phthalate, bis-2-	117-81-7	1.5E-02	10,000	1.5E-06		7.3E-03	7.3E-07	7.3E-03	7.3E-07
Fluoranthene	206-44-0	3.3E-02	1,500	2.2E-05		1.6E-02	1.1E-05	1.6E-02	1.1E-05
Fluorene	86-73-7	8.2E-03	6,600	1.2E-06		4.1E-03	6.2E-07	4.1E-03	6.2E-07
Formaldehyde	50-00-0	5.9E-01	55	1.1E-02		2.9E-01	5.4E-03	2.9E-01	5.4E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	3.6E-07	3	1.2E-07		1.8E-07	6.0E-08	1.8E-07	6.0E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	9.1E-06	45	2.0E-07		4.6E-06	1.0E-07	4.6E-06	1.0E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	2.4E-06	60	4.0E-08		1.2E-06	2.0E-08	1.2E-06	2.0E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	4.4E-08	0.07	5.9E-07		2.2E-08	3.0E-07	2.2E-08	3.0E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.1E-07	0.75	1.5E-07		5.6E-08	7.4E-08	5.6E-08	7.4E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	7.6E-08	4	2.0E-08		3.8E-08	9.8E-09	3.8E-08	9.8E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	3.3E-06	0.07	4.4E-05		1.6E-06	2.2E-05	1.6E-06	2.2E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	2.0E-06	0.04	5.4E-05		1.0E-06	2.7E-05	1.0E-06	2.7E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.5E-06	30	5.0E-08		7.5E-07	2.5E-08	7.5E-07	2.5E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	2.4E-06	0.49	4.9E-06		1.2E-06	2.4E-06	1.2E-06	2.4E-06
Hexachloro-1,3-butadiene	87-68-3	1.0E-02	11,000	9.3E-07		5.1E-03	4.6E-07	5.1E-03	4.6E-07
Hexachlorobenzene	118-74-1	5.9E-02	6	9.8E-03		2.9E-02	4.9E-03	2.9E-02	4.9E-03
Hexachlorocyclopentadiene	77-47-4	1.4E-01	110	1.3E-03		6.9E-02	6.3E-04	6.9E-02	6.3E-04
Hexachloroethane (Perchloroethane)	67-72-1	7.4E-03	29,000	2.6E-07		3.7E-03	1.3E-07	3.7E-03	1.3E-07
Hexachloropropene	1888-71-7	9.9E-03	905	1.1E-05		4.9E-03	5.5E-06	4.9E-03	5.5E-06
Hexane	110-54-3	1.2E-01	1,100,000	1.1E-07		6.1E-02	5.6E-08	6.1E-02	5.6E-08
Hydrogen chloride	7647-01-0	2.2E+02	2,100	1.1E-01		1.1E+02	5.3E-02	1.1E+02	5.3E-02
Indeno(1,2,3-cd) pyrene	193-39-5	5.0E-03	15	3.3E-04		2.5E-03	1.7E-04	2.5E-03	1.7E-04
Isophorone	78-59-1	6.9E-03	23,000	3.0E-07		3.4E-03	1.5E-07	3.4E-03	1.5E-07
Lead	7439-92-1	5.1E-01	150	3.4E-03		2.5E-01	1.7E-03	2.5E-01	1.7E-03
Manganese	7439-96-5	1.2E+00	3,000	3.9E-04		5.8E-01	1.9E-04	5.8E-01	1.9E-04
Mercuric chloride	7487-94-7	6.7E-05	2,700	2.5E-08		3.3E-05	1.2E-08	3.3E-05	1.2E-08
Methacrylonitrile	126-98-7	7.4E-02	2,700	2.7E-05		3.7E-02	1.4E-05	3.7E-02	1.4E-05
Methyl bromide	74-83-9	1.5E-03	3,900	3.9E-07		7.5E-04	1.9E-07	7.5E-04	1.9E-07
Methyl chloride	74-87-3	1.8E-01	210,000	8.4E-07		8.8E-02	4.2E-07	8.8E-02	4.2E-07
Methyl ethyl ketone	78-93-3	4.9E-02	13,000	3.8E-06		2.4E-02	1.9E-06	2.4E-02	1.9E-06
Methyl isobutyl ketone	108-10-1	1.0E-02	310,000	3.3E-08		5.1E-03	1.7E-08	5.1E-03	1.7E-08
Methyl tert-butyl ether	1634-04-4	1.6E-01	180,000	9.1E-07		8.1E-02	4.5E-07	8.1E-02	4.5E-07
Methylcyclohexane	108-87-2	1.5E-01	1,600,000	9.4E-08		7.5E-02	4.7E-08	7.5E-02	4.7E-08
Methylene chloride	75-09-2	3.0E+00	14,000	2.2E-04		1.5E+00	1.1E-04	1.5E+00	1.1E-04
Methylmethacrylate	80-62-6	2.0E-02	70,000	2.9E-07		1.0E-02	1.4E-07	1.0E-02	1.4E-07

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	1.2E+00	79,000	1.5E-05		5.7E-01	7.3E-06	5.7E-01	7.3E-06
Nickel	7440-02-0	7.2E-01	0.20	3.6E+00		3.6E-01	1.8E+00	6.2E-03	3.1E-02
Nitroaniline, 2-	88-74-4	6.9E-03	4,800	1.4E-06		3.4E-03	7.2E-07	3.4E-03	7.2E-07
Nitroaniline, 3-	99-09-2	2.8E-02	110	2.5E-04		1.4E-02	1.2E-04	1.4E-02	1.2E-04
Nitroaniline, 4-	100-01-6	2.8E-02	9,000	3.1E-06		1.4E-02	1.5E-06	1.4E-02	1.5E-06
Nitrobenzene	98-95-3	7.8E-03	9,100	8.6E-07		3.9E-03	4.3E-07	3.9E-03	4.3E-07
Nitrophenol, 2-	88-75-5	5.9E-02	1,000	5.9E-05		3.0E-02	3.0E-05	3.0E-02	3.0E-05
Nitrophenol, 4-	100-02-7	4.5E-02	1,200	3.8E-05		2.3E-02	1.9E-05	2.3E-02	1.9E-05
Nitroso-di-n-butylamine, n-	924-16-3	6.9E-03	2,000	3.4E-06		3.4E-03	1.7E-06	3.4E-03	1.7E-06
Nitrosodiphenylamine, N-	86-30-6	1.2E-03	1,400	8.7E-07		6.1E-04	4.4E-07	6.1E-04	4.4E-07
Nitrosodipropylamine, n-	621-64-7	6.9E-03	2,000	3.4E-06		3.4E-03	1.7E-06	3.4E-03	1.7E-06
n-Nitrosodiethylamine	55-18-5	6.9E-03	1,700	4.0E-06		3.4E-03	2.0E-06	3.4E-03	2.0E-06
n-Nitrosodimethylamine	62-75-9	7.0E-03	1,700	4.1E-06		3.5E-03	2.1E-06	3.5E-03	2.1E-06
n-Nitrosomethylethylamine	10595-95-6	1.1E-02	1,700	6.7E-06		5.7E-03	3.4E-06	5.7E-03	3.4E-06
n-Nitrosomorpholine	59-89-2	6.9E-03	74	9.3E-05		3.4E-03	4.6E-05	3.4E-03	4.6E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	4.6E-07	3	1.5E-07		2.3E-07	7.7E-08	2.3E-07	7.7E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	6.6E-06	75	8.8E-08		3.3E-06	4.4E-08	3.3E-06	4.4E-08
o-Tolualdehyde	529-20-4	5.0E-01	17,000	3.0E-05		2.5E-01	1.5E-05	2.5E-01	1.5E-05
p-Dimethylaminoazobenzene	60-11-7	6.9E-03	670	1.0E-05		3.4E-03	5.1E-06	3.4E-03	5.1E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	8.4E-08	0.10	8.4E-07		4.2E-08	4.2E-07	4.2E-08	4.2E-07
PentaCDF, 1,2,3,7,8-	57117-41-6	1.0E-06	0.24	4.2E-06		5.0E-07	2.1E-06	5.0E-07	2.1E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	2.0E-06	0.07	2.7E-05		1.0E-06	1.4E-05	1.0E-06	1.4E-05
Pentachlorobenzene	608-93-5	6.9E-03	1,600	4.3E-06		3.4E-03	2.1E-06	3.4E-03	2.1E-06
Pentachloroethane	76-01-7	8.8E-03	320,000	2.7E-08		4.4E-03	1.4E-08	4.4E-03	1.4E-08
Pentachloronitrobenzene	82-68-8	7.3E-03	1,500	4.9E-06		3.6E-03	2.4E-06	3.6E-03	2.4E-06
Pentachlorophenol	87-86-5	3.4E-01	1,400	2.5E-04		1.7E-01	1.2E-04	1.7E-01	1.2E-04
Perchlorate	14797-73-0	6.1E-03	23	2.7E-04		3.1E-03	1.3E-04	3.1E-03	1.3E-04
Phenanthrene	85-01-8	4.0E-02	760	5.2E-05		2.0E-02	2.6E-05	2.0E-02	2.6E-05
Phenol	108-95-2	3.7E-02	5,800	6.5E-06		1.9E-02	3.2E-06	1.9E-02	3.2E-06

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	1.4E+00	270	5.1E-03		6.8E-01	2.5E-03	6.8E-01	2.5E-03
Propanal	123-38-6	6.5E-01	110,000	5.9E-06		3.3E-01	3.0E-06	3.3E-01	3.0E-06
Propylbenzene	103-65-1	5.8E-02	5,400	1.1E-05		2.9E-02	5.3E-06	2.9E-02	5.3E-06
Propylene	115-07-1	6.2E-01	860,000	7.2E-07		3.1E-01	3.6E-07	3.1E-01	3.6E-07
Pyrene	129-00-0	2.8E-02	150	1.9E-04		1.4E-02	9.4E-05	1.4E-02	9.4E-05
Pyridine	110-86-1	1.0E-02	9,700	1.1E-06		5.1E-03	5.2E-07	5.1E-03	5.2E-07
Selenium	7782-49-2	2.0E-02	200	1.0E-04		1.0E-02	5.0E-05	1.0E-02	5.0E-05
Silver	7440-22-4	1.5E-02	100	1.5E-04		7.5E-03	7.5E-05	7.5E-03	7.5E-05
Styrene	100-42-5	1.6E-02	21,000	7.8E-07		8.1E-03	3.9E-07	8.1E-03	3.9E-07
TetraCDD, 2,3,7,8-	1746-01-6	2.9E-08	0.00003	9.6E-04		1.4E-08	4.8E-04	1.4E-08	4.8E-04
TetraCDF, 2,3,7,8-	51207-31-9	5.0E-07	0.07	6.8E-06		2.5E-07	3.4E-06	2.5E-07	3.4E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	6.9E-03	240	2.9E-05		3.4E-03	1.4E-05	3.4E-03	1.4E-05
Tetrachloroethane, 1,1,2,2-	79-34-5	5.3E-03	7,000	7.5E-07		2.6E-03	3.8E-07	2.6E-03	3.8E-07
Tetrachloroethylene	127-18-4	3.1E-02	20,000	1.6E-06		1.6E-02	7.8E-07	1.6E-02	7.8E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	8.9E-03	1,300	6.9E-06		4.5E-03	3.4E-06	4.5E-03	3.4E-06
Tetrahydrofuran	109-99-9	1.1E-02	290,000	3.9E-08		5.6E-03	1.9E-08	5.6E-03	1.9E-08
Toluene	108-88-3	3.5E-01	37,000	9.5E-06		1.8E-01	4.7E-06	1.8E-01	4.7E-06
Toluidine, o-	95-53-4	8.8E-02	8,800	1.0E-05		4.4E-02	5.0E-06	4.4E-02	5.0E-06
Trans-1,3-dichloropropene	10061-02-6	7.7E-03	75,000	1.0E-07		3.8E-03	5.1E-08	3.8E-03	5.1E-08
trans-2-Butene	624-64-6	9.7E-02	1,000,000	9.7E-08		4.8E-02	4.8E-08	4.8E-02	4.8E-08
Trichlorobenzene, 1,2,4-	120-82-1	8.1E-03	3,400	2.4E-06		4.0E-03	1.2E-06	4.0E-03	1.2E-06
Trichloroethane, 1,1,1-	71-55-6	3.4E-03	1,300,000	2.6E-09		1.7E-03	1.3E-09	1.7E-03	1.3E-09
Trichloroethane, 1,1,2-	79-00-5	9.2E-03	81,000	1.1E-07		4.6E-03	5.6E-08	4.6E-03	5.6E-08
Trichloroethylene	79-01-6	1.2E-02	700,000	1.7E-08		5.9E-03	8.4E-09	5.9E-03	8.4E-09
Trichlorophenol, 2,4,5-	95-95-4	1.8E-02	7,400	2.4E-06		8.9E-03	1.2E-06	8.9E-03	1.2E-06
Trichlorophenol, 2,4,6-	88-06-2	1.6E-02	1,800	9.1E-06		8.2E-03	4.6E-06	8.2E-03	4.6E-06
Trimethylbenzene, 1,3,5-	108-67-8	2.4E-01	690,000	3.5E-07		1.2E-01	1.7E-07	1.2E-01	1.7E-07
Trinitrobenzene, 1,3,5	99-35-4	6.9E-03	530	1.3E-05		3.4E-03	6.5E-06	3.4E-03	6.5E-06
Undecane	1120-21-4	1.5E-01	1,500	1.0E-04		7.5E-02	5.0E-05	7.5E-02	5.0E-05

Source M-136 A and M-225 A, Acute HQs and HI for Blue Creek, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	9.5E-02	180,000	5.3E-07		4.8E-02	2.6E-07	4.8E-02	2.6E-07
Xylene, m-	108-38-3	1.4E-01	22,000	6.3E-06		6.9E-02	3.1E-06	6.9E-02	3.1E-06
Xylene, o-	95-47-6	1.6E-01	22,000	7.4E-06		8.1E-02	3.7E-06	8.1E-02	3.7E-06
Xylene, p-	106-42-3	1.4E-01	22,000	6.3E-06		6.9E-02	3.1E-06	6.9E-02	3.1E-06
Zinc	7440-66-6	7.0E-01	1,900	3.7E-04		3.5E-01	1.8E-04	3.5E-01	1.8E-04
			Total	**4.7**		**Total**	**2.4**	**With adjusted Ni & Cr**	**0.6**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	6.0E-03	690,000	8.7E-09		3.0E-03	4.3E-09	3.0E-03	4.3E-09
1,2,4-Trimethylbenzene	95-63-6	3.6E-01	690,000	5.2E-07		1.8E-01	2.6E-07	1.8E-01	2.6E-07
1,4-Diethylbenzene	105-05-5	9.5E-03	12,000	7.9E-07		4.8E-03	4.0E-07	4.8E-03	4.0E-07
1-Butene	106-98-9	3.1E-01	1,200,000	2.6E-07		1.6E-01	1.3E-07	1.6E-01	1.3E-07
1-Chloronapthalene	90-13-1	7.8E-03	4,600	1.7E-06		3.9E-03	8.5E-07	3.9E-03	8.5E-07
1-Naphthylamine	134-32-7	1.6E-01	210	7.4E-04		7.8E-02	3.7E-04	7.8E-02	3.7E-04
2,2,4-Trimethylpentane	540-84-1	3.4E-01	14,000,000	2.4E-08		1.7E-01	1.2E-08	1.7E-01	1.2E-08
2,2-Dimethylbutane	75-83-2	2.0E-02	1,800,000	1.1E-08		9.9E-03	5.5E-09	9.9E-03	5.5E-09
2,3,4-Trimethylpentane	565-75-3	1.2E-01	14,000,000	8.3E-09		5.8E-02	4.2E-09	5.8E-02	4.2E-09
2,3-Dimethylbutane	79-29-8	5.0E-02	1,800,000	2.8E-08		2.5E-02	1.4E-08	2.5E-02	1.4E-08
2,3-Dimethylpentane	565-59-3	2.0E-01	1,800,000	1.1E-07		9.9E-02	5.5E-08	9.9E-02	5.5E-08
2,4-Dimethylpentane	108-08-7	7.4E-02	180,000	4.1E-07		3.7E-02	2.0E-07	3.7E-02	2.0E-07
2,5-Dimethylbenzaldehyde	5779-94-2	3.8E-01	17,000	2.3E-05		1.9E-01	1.1E-05	1.9E-01	1.1E-05
2,6-Dichlorophenol	87-65-0	7.8E-03	8,800	8.9E-07		3.9E-03	4.4E-07	3.9E-03	4.4E-07
2-Ethyltoluene	611-14-3	6.4E-03	12,000	5.3E-07		3.2E-03	2.7E-07	3.2E-03	2.7E-07
2-Hexanone	591-78-6	2.8E-02	41,000	6.9E-07		1.4E-02	3.5E-07	1.4E-02	3.5E-07
2-Methylhexane	591-76-4	2.4E-01	1,800,000	1.3E-07		1.2E-01	6.7E-08	1.2E-01	6.7E-08
2-Methylnaphthalene	91-57-6	1.1E-01	3,000	3.5E-05		5.3E-02	1.8E-05	5.3E-02	1.8E-05
2-Methylpentane	107-83-5	1.6E-01	1,800,000	8.7E-08		7.8E-02	4.3E-08	7.8E-02	4.3E-08
2-Naphthylamine	91-59-8	1.6E-01	320	4.9E-04		7.8E-02	2.4E-04	7.8E-02	2.4E-04
3-Ethyltoluene	620-14-4	6.8E-02	12,000	5.7E-06		3.4E-02	2.8E-06	3.4E-02	2.8E-06
3-Methylheptane	589-81-1	5.0E-02	1,400,000	3.6E-08		2.5E-02	1.8E-08	2.5E-02	1.8E-08
3-Methylhexane	589-34-4	3.1E-01	1,800,000	1.7E-07		1.6E-01	8.7E-08	1.6E-01	8.7E-08
3-Methylpentane	96-14-0	1.0E-01	1,800,000	5.6E-08		5.0E-02	2.8E-08	5.0E-02	2.8E-08
4,6-Dinitro-2-methylphenol	534-52-1	1.4E-01	200	6.8E-04		6.8E-02	3.4E-04	6.8E-02	3.4E-04
4-Aminobyphenyl	92-67-1	1.6E-01	490	3.2E-04		7.8E-02	1.6E-04	7.8E-02	1.6E-04
4-Ethyltoluene	622-96-8	7.5E-02	12,000	6.3E-06		3.8E-02	3.1E-06	3.8E-02	3.1E-06
Acenaphthene	83-32-9	7.8E-03	3,600	2.2E-06		3.9E-03	1.1E-06	3.9E-03	1.1E-06
Acenaphthylene	208-96-8	4.4E-02	10,000	4.4E-06		2.2E-02	2.2E-06	2.2E-02	2.2E-06
Acetaldehyde	75-07-0	1.3E+00	470	2.8E-03		6.6E-01	1.4E-03	6.6E-01	1.4E-03
Acetone	67-64-1	3.4E-01	470,000	7.3E-07		1.7E-01	3.6E-07	1.7E-01	3.6E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetonitrile	75-05-8	2.7E-01	22,000	1.2E-05		1.3E-01	6.1E-06	1.3E-01	6.1E-06
Acetophenone	98-86-2	3.8E-02	10,000	3.8E-06		1.9E-02	1.9E-06	1.9E-02	1.9E-06
Acrylonitrile	107-13-1	2.3E-01	10,000	2.3E-05		1.1E-01	1.1E-05	1.1E-01	1.1E-05
Aluminum	7429-90-5	5.6E+02	3,000	1.9E-01		2.8E+02	9.3E-02	2.8E+02	9.3E-02
Aniline	62-53-3	1.1E-01	30,000	3.8E-06		5.7E-02	1.9E-06	5.7E-02	1.9E-06
Anthracene	120-12-7	1.8E-03	270	6.8E-06		9.2E-04	3.4E-06	9.2E-04	3.4E-06
Antimony	7440-36-0	4.1E-01	500	8.2E-04		2.1E-01	4.1E-04	2.1E-01	4.1E-04
Arsenic	7440-38-2	7.7E-03	0.20	3.9E-02		3.8E-03	1.9E-02	3.8E-03	1.9E-02
Barium	7440-39-3	5.5E-03	1,500	3.6E-06		2.7E-03	1.8E-06	2.7E-03	1.8E-06
Benzaldehyde	100-52-7	5.4E-01	17,000	3.2E-05		2.7E-01	1.6E-05	2.7E-01	1.6E-05
Benzene	71-43-2	1.7E+00	27	6.3E-02		8.5E-01	3.2E-02	8.5E-01	3.2E-02
Benzo(a)anthracene	56-55-3	8.3E-03	1,200	6.9E-06		4.1E-03	3.5E-06	4.1E-03	3.5E-06
Benzo(a)pyrene	50-32-8	1.1E-03	600	1.8E-06		5.4E-04	9.0E-07	5.4E-04	9.0E-07
Benzo(b)fluoranthene	205-99-2	1.6E-02	31	5.3E-04		8.2E-03	2.6E-04	8.2E-03	2.6E-04
Benzo(g,h,i)perylene	191-24-2	6.4E-03	30,000	2.1E-07		3.2E-03	1.1E-07	3.2E-03	1.1E-07
Benzo(k)fluoranthene	207-08-9	1.6E-02	19	8.6E-04		8.1E-03	4.3E-04	8.1E-03	4.3E-04
Benzoic acid	65-85-0	8.9E-01	2,800	3.2E-04		4.4E-01	1.6E-04	4.4E-01	1.6E-04
Benzyl alcohol	100-51-6	1.1E-02	130,000	8.5E-08		5.5E-03	4.2E-08	5.5E-03	4.2E-08
Benzyl chloride	100-44-7	8.1E-03	240	3.4E-05		4.0E-03	1.7E-05	4.0E-03	1.7E-05
Bis(2-chlorethyl)ether	111-44-4	8.7E-03	58,000	1.5E-07		4.3E-03	7.5E-08	4.3E-03	7.5E-08
Bis(2-chloroethoxy)methane	111-91-1	7.8E-03	920	8.5E-06		3.9E-03	4.2E-06	3.9E-03	4.2E-06
Bromodichloromethane	75-27-4	1.1E-02	260	4.3E-05		5.5E-03	2.1E-05	5.5E-03	2.1E-05
Bromoform	75-25-2	1.8E-02	15,000	1.2E-06		9.2E-03	6.1E-07	9.2E-03	6.1E-07
Bromophenyl-phenylether, 4-	101-55-3	7.8E-03	290	2.7E-05		3.9E-03	1.3E-05	3.9E-03	1.3E-05
Butylbenzylphthalate	85-68-7	2.1E-03	15,000	1.4E-07		1.1E-03	7.1E-08	1.1E-03	7.1E-08
Cadmium	7440-43-9	6.6E-04	100	6.6E-06		3.3E-04	3.3E-06	3.3E-04	3.3E-06
Carbazole	86-74-8	1.0E-02	660	1.5E-05		5.0E-03	7.5E-06	5.0E-03	7.5E-06
Carbon disulfide	75-15-0	1.4E-01	6,200	2.2E-05		7.0E-02	1.1E-05	7.0E-02	1.1E-05
Carbon tetrachloride	56-23-5	2.1E-01	1,900	1.1E-04		1.1E-01	5.6E-05	1.1E-01	5.6E-05
Chlorine	7782-50-5	1.7E+02	210	8.0E-01		8.4E+01	4.0E-01	8.4E+01	4.0E-01
Chloro-3-methylphenol, 4-	59-50-7	9.7E-03	5,500	1.8E-06		4.8E-03	8.8E-07	4.8E-03	8.8E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroacetonitrile	107-14-2	1.6E-02	9,000	1.7E-06		7.8E-03	8.7E-07	7.8E-03	8.7E-07
Chloroaniline, p-	106-47-8	2.2E-03	2,200	1.0E-06		1.1E-03	5.0E-07	1.1E-03	5.0E-07
Chlorobenzene	108-90-7	3.6E-02	46,000	7.7E-07		1.8E-02	3.9E-07	1.8E-02	3.9E-07
Chloroethane	75-00-3	6.3E-03	260,000	2.4E-08		3.1E-03	1.2E-08	3.1E-03	1.2E-08
Chloroform (Trichloromethane)	67-66-3	8.7E-02	150	5.8E-04		4.3E-02	2.9E-04	4.3E-02	2.9E-04
Chloronaphthalene,2-	91-58-7	7.8E-03	600	1.3E-05		3.9E-03	6.5E-06	3.9E-03	6.5E-06
Chlorophenol, 2-	95-57-8	2.7E-02	1,300	2.1E-05		1.4E-02	1.0E-05	1.4E-02	1.0E-05
Chromium III	7440-47-3	1.5E-01	1,500	1.0E-04		7.7E-02	5.1E-05	3.8E-03	2.6E-06
Chromium, hexavalent	18540-29-9	1.3E-01	89	1.4E-03		6.3E-02	7.1E-04	3.1E-03	3.5E-05
Chrysene	218-01-9	1.0E-02	600	1.7E-05		5.1E-03	8.5E-06	5.1E-03	8.5E-06
Cis-1,3-dichloropropene	10062-01-5	1.8E-02	600	3.1E-05		9.2E-03	1.5E-05	9.2E-03	1.5E-05
cis-2-Butene	590-18-1	2.4E-02	150,000,000	1.6E-10		1.2E-02	8.0E-11	1.2E-02	8.0E-11
Cobalt	7440-48-4	1.7E-03	180	9.3E-06		8.4E-04	4.7E-06	8.4E-04	4.7E-06
Copper	7440-50-8	3.5E-01	100	3.5E-03		1.7E-01	1.7E-03	1.7E-01	1.7E-03
Cresol, m-	108-39-4	1.8E-03	20,000	9.1E-08		9.1E-04	4.6E-08	9.1E-04	4.6E-08
Cresol, o-	95-48-7	4.7E-02	20,000	2.3E-06		2.3E-02	1.2E-06	2.3E-02	1.2E-06
Cresol, p-	106-44-5	1.8E-03	20,000	9.1E-08		9.1E-04	4.6E-08	9.1E-04	4.6E-08
Crotonaldehyde	4170-30-3	4.5E-02	540	8.4E-05		2.3E-02	4.2E-05	2.3E-02	4.2E-05
Cumene	98-82-8	6.0E-03	250,000	2.4E-08		3.0E-03	1.2E-08	3.0E-03	1.2E-08
Cyclohexane	110-82-7	3.6E-02	340,000	1.0E-07		1.8E-02	5.2E-08	1.8E-02	5.2E-08
Dibenz(a,h)anthracene	53-70-3	1.4E-03	34	4.2E-05		7.2E-04	2.1E-05	7.2E-04	2.1E-05
Dibenzofuran	132-64-9	7.8E-03	30,000	2.6E-07		3.9E-03	1.3E-07	3.9E-03	1.3E-07
Dibromochloromethane	124-48-1	1.3E-02	7,400	1.7E-06		6.2E-03	8.4E-07	6.2E-03	8.4E-07
Dichlorobenzene, 1,2-	95-50-1	7.9E-03	300,000	2.6E-08		4.0E-03	1.3E-08	4.0E-03	1.3E-08
Dichlorobenzene, 1,3-	541-73-1	8.9E-03	16,000	5.5E-07		4.4E-03	2.8E-07	4.4E-03	2.8E-07
Dichlorobenzene,1,4-	106-46-7	8.3E-03	60,000	1.4E-07		4.1E-03	6.9E-08	4.1E-03	6.9E-08
Dichloroethane 1,1-	75-34-3	4.5E-03	650,000	7.0E-09		2.3E-03	3.5E-09	2.3E-03	3.5E-09
Dichloroethane, 1,2	107-06-2	7.7E-03	200,000	3.8E-08		3.8E-03	1.9E-08	3.8E-03	1.9E-08
Dichloroethylene 1,1-	75-35-4	6.1E-03	180,000	3.4E-08		3.1E-03	1.7E-08	3.1E-03	1.7E-08
Dichloroethylene, cis-1,2-	156-59-2	1.7E-03	560,000	3.0E-09		8.5E-04	1.5E-09	8.5E-04	1.5E-09
Dichloroethylene-1,2 (trans)	156-60-5	1.0E-02	1,100,000	9.3E-09		5.1E-03	4.6E-09	5.1E-03	4.6E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorophenol, 2,4-	120-83-2	1.3E-02	1,300	1.0E-05		6.6E-03	5.1E-06	6.6E-03	5.1E-06
Dichloropropane, 1,2-	78-87-5	5.3E-03	140,000	3.8E-08		2.6E-03	1.9E-08	2.6E-03	1.9E-08
Diethyl phthalate	84-66-2	1.1E-02	5,000	2.3E-06		5.7E-03	1.1E-06	5.7E-03	1.1E-06
Dimethyl phthalate	131-11-3	7.8E-03	15,000	5.2E-07		3.9E-03	2.6E-07	3.9E-03	2.6E-07
Dimethylphenol, 2,4-	105-67-9	9.8E-02	4,500	2.2E-05		4.9E-02	1.1E-05	4.9E-02	1.1E-05
Di-n-butyl phthalate	84-74-2	1.6E-01	15,000	1.0E-05		7.8E-02	5.2E-06	7.8E-02	5.2E-06
Dinitrobenzene, 1,3-	99-65-0	8.1E-03	1,000	8.1E-06		4.0E-03	4.0E-06	4.0E-03	4.0E-06
Dinitrophenol, 2,4-	51-28-5	3.4E-01	220	1.6E-03		1.7E-01	7.8E-04	1.7E-01	7.8E-04
Dinitrotoluene, 2,4-	121-14-2	7.8E-03	600	1.3E-05		3.9E-03	6.5E-06	3.9E-03	6.5E-06
Dinitrotoluene, 2,6-	606-20-2	8.0E-03	600	1.3E-05		4.0E-03	6.7E-06	4.0E-03	6.7E-06
Di-n-octylphthalate	117-84-0	5.3E-02	6,800	7.7E-06		2.6E-02	3.9E-06	2.6E-02	3.9E-06
Dioxane, 1,4-	123-91-1	9.1E-03	3,000	3.0E-06		4.5E-03	1.5E-06	4.5E-03	1.5E-06
Diphenylamine	122-39-4	7.8E-03	30,000	2.6E-07		3.9E-03	1.3E-07	3.9E-03	1.3E-07
Ethyl methacrylate	97-63-2	2.3E-02	13,000	1.7E-06		1.1E-02	8.7E-07	1.1E-02	8.7E-07
Ethylbenzene	100-41-4	1.6E-01	140,000	1.1E-06		7.8E-02	5.6E-07	7.8E-02	5.6E-07
Ethylene Dibromide	106-93-4	1.3E-02	130,000	9.7E-08		6.3E-03	4.9E-08	6.3E-03	4.9E-08
Ethylether	60-29-7	3.6E-02	1,500,000	2.4E-08		1.8E-02	1.2E-08	1.8E-02	1.2E-08
Ethylhexyl phthalate, bis-2-	117-81-7	1.7E-02	10,000	1.7E-06		8.2E-03	8.2E-07	8.2E-03	8.2E-07
Fluoranthene	206-44-0	3.7E-02	1,500	2.5E-05		1.9E-02	1.2E-05	1.9E-02	1.2E-05
Fluorene	86-73-7	9.3E-03	6,600	1.4E-06		4.6E-03	7.0E-07	4.6E-03	7.0E-07
Formaldehyde	50-00-0	6.7E-01	55	1.2E-02		3.3E-01	6.1E-03	3.3E-01	6.1E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	4.1E-07	3	1.4E-07		2.0E-07	6.8E-08	2.0E-07	6.8E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.0E-05	45	2.3E-07		5.1E-06	1.1E-07	5.1E-06	1.1E-07
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	2.7E-06	60	4.5E-08		1.3E-06	2.2E-08	1.3E-06	2.2E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	4.9E-08	0.07	6.7E-07		2.5E-08	3.3E-07	2.5E-08	3.3E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.3E-07	0.75	1.7E-07		6.3E-08	8.4E-08	6.3E-08	8.4E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	8.6E-08	4	2.2E-08		4.3E-08	1.1E-08	4.3E-08	1.1E-08
HexaCDF, 1,2,3,4,7,8-	70648-26-9	3.7E-06	0.07	5.0E-05		1.8E-06	2.5E-05	1.8E-06	2.5E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	2.3E-06	0.04	6.1E-05		1.1E-06	3.0E-05	1.1E-06	3.0E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.7E-06	30	5.7E-08		8.5E-07	2.8E-08	8.5E-07	2.8E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	2.7E-06	0.49	5.5E-06		1.3E-06	2.7E-06	1.3E-06	2.7E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Hexachloro-1,3-butadiene	87-68-3	1.2E-02	11,000	1.0E-06		5.8E-03	5.2E-07	5.8E-03	5.2E-07
Hexachlorobenzene	118-74-1	6.6E-02	6	1.1E-02		3.3E-02	5.5E-03	3.3E-02	5.5E-03
Hexachlorocyclopentadiene	77-47-4	1.6E-01	110	1.4E-03		7.8E-02	7.1E-04	7.8E-02	7.1E-04
Hexachloroethane (Perchloroethane)	67-72-1	8.4E-03	29,000	2.9E-07		4.2E-03	1.4E-07	4.2E-03	1.4E-07
Hexachloropropene	1888-71-7	1.1E-02	905	1.2E-05		5.6E-03	6.2E-06	5.6E-03	6.2E-06
Hexane	110-54-3	1.4E-01	1,100,000	1.3E-07		7.0E-02	6.3E-08	7.0E-02	6.3E-08
Hydrogen chloride	7647-01-0	2.5E+02	2,100	1.2E-01		1.3E+02	6.0E-02	1.3E+02	6.0E-02
Indeno(1,2,3-cd) pyrene	193-39-5	5.6E-03	15	3.7E-04		2.8E-03	1.9E-04	2.8E-03	1.9E-04
Isophorone	78-59-1	7.8E-03	23,000	3.4E-07		3.9E-03	1.7E-07	3.9E-03	1.7E-07
Lead	7439-92-1	5.7E-01	150	3.8E-03		2.9E-01	1.9E-03	2.9E-01	1.9E-03
Manganese	7439-96-5	1.3E+00	3,000	4.4E-04		6.6E-01	2.2E-04	6.6E-01	2.2E-04
Mercuric chloride	7487-94-7	7.5E-05	2,700	2.8E-08		3.8E-05	1.4E-08	3.8E-05	1.4E-08
Methacrylonitrile	126-98-7	8.4E-02	2,700	3.1E-05		4.2E-02	1.6E-05	4.2E-02	1.6E-05
Methyl bromide	74-83-9	1.7E-03	3,900	4.4E-07		8.5E-04	2.2E-07	8.5E-04	2.2E-07
Methyl chloride	74-87-3	2.0E-01	210,000	9.5E-07		9.9E-02	4.7E-07	9.9E-02	4.7E-07
Methyl ethyl ketone	78-93-3	5.5E-02	13,000	4.3E-06		2.8E-02	2.1E-06	2.8E-02	2.1E-06
Methyl isobutyl ketone	108-10-1	1.2E-02	310,000	3.8E-08		5.8E-03	1.9E-08	5.8E-03	1.9E-08
Methyl tert-butyl ether	1634-04-4	1.8E-01	180,000	1.0E-06		9.2E-02	5.1E-07	9.2E-02	5.1E-07
Methylcyclohexane	108-87-2	1.7E-01	1,600,000	1.1E-07		8.5E-02	5.3E-08	8.5E-02	5.3E-08
Methylene chloride	75-09-2	3.4E+00	14,000	2.4E-04		1.7E+00	1.2E-04	1.7E+00	1.2E-04
Methylmethacrylate	80-62-6	2.3E-02	70,000	3.2E-07		1.1E-02	1.6E-07	1.1E-02	1.6E-07
Naphthalene	91-20-3	1.3E+00	79,000	1.6E-05		6.5E-01	8.2E-06	6.5E-01	8.2E-06
Nickel	7440-02-0	8.1E-01	0.20	4.1E+00		4.1E-01	2.0E+00	7.0E-03	3.5E-02
Nitroaniline, 2-	88-74-4	7.8E-03	4,800	1.6E-06		3.9E-03	8.1E-07	3.9E-03	8.1E-07
Nitroaniline, 3-	99-09-2	3.1E-02	110	2.8E-04		1.6E-02	1.4E-04	1.6E-02	1.4E-04
Nitroaniline, 4-	100-01-6	3.1E-02	9,000	3.5E-06		1.6E-02	1.7E-06	1.6E-02	1.7E-06
Nitrobenzene	98-95-3	8.9E-03	9,100	9.7E-07		4.4E-03	4.9E-07	4.4E-03	4.9E-07
Nitrophenol, 2-	88-75-5	6.7E-02	1,000	6.7E-05		3.3E-02	3.3E-05	3.3E-02	3.3E-05
Nitrophenol, 4-	100-02-7	5.1E-02	1,200	4.3E-05		2.6E-02	2.1E-05	2.6E-02	2.1E-05
Nitroso-di-n-butylamine, n-	924-16-3	7.8E-03	2,000	3.9E-06		3.9E-03	1.9E-06	3.9E-03	1.9E-06
Nitrosodiphenylamine, N-	86-30-6	1.4E-03	1,400	9.9E-07		6.9E-04	4.9E-07	6.9E-04	4.9E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Nitrosodipropylamine, n-	621-64-7	7.8E-03	2,000	3.9E-06		3.9E-03	1.9E-06	3.9E-03	1.9E-06
n-Nitrosodiethylamine	55-18-5	7.8E-03	1,700	4.6E-06		3.9E-03	2.3E-06	3.9E-03	2.3E-06
n-Nitrosodimethylamine	62-75-9	7.9E-03	1,700	4.7E-06		4.0E-03	2.3E-06	4.0E-03	2.3E-06
n-Nitrosomethylethylamine	10595-95-	1.3E-02	1,700	7.6E-06		6.4E-03	3.8E-06	6.4E-03	3.8E-06
n-Nitrosomorpholine	59-89-2	7.8E-03	74	1.1E-04		3.9E-03	5.3E-05	3.9E-03	5.3E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	5.2E-07	3	1.7E-07		2.6E-07	8.7E-08	2.6E-07	8.7E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-	7.5E-06	75	1.0E-07		3.7E-06	5.0E-08	3.7E-06	5.0E-08
o-Tolualdehyde	529-20-4	5.7E-01	17,000	3.3E-05		2.8E-01	1.7E-05	2.8E-01	1.7E-05
p-Dimethylaminoazobenzene	60-11-7	7.7E-03	670	1.2E-05		3.9E-03	5.8E-06	3.9E-03	5.8E-06
PentaCDD, 1,2,3,7,8-	40321-76-	9.5E-08	0.10	9.5E-07		4.7E-08	4.7E-07	4.7E-08	4.7E-07
PentaCDF, 1,2,3,7,8-	57117-41-	1.1E-06	0.24	4.7E-06		5.6E-07	2.4E-06	5.6E-07	2.4E-06
PentaCDF, 2,3,4,7,8-	57117-31-	2.3E-06	0.07	3.1E-05		1.1E-06	1.5E-05	1.1E-06	1.5E-05
Pentachlorobenzene	608-93-5	7.8E-03	1,600	4.9E-06		3.9E-03	2.4E-06	3.9E-03	2.4E-06
Pentachloroethane	76-01-7	9.9E-03	320,000	3.1E-08		5.0E-03	1.5E-08	5.0E-03	1.5E-08
Pentachloronitrobenzene	82-68-8	8.3E-03	1,500	5.5E-06		4.1E-03	2.7E-06	4.1E-03	2.7E-06
Pentachlorophenol	87-86-5	3.9E-01	1,400	2.8E-04		1.9E-01	1.4E-04	1.9E-01	1.4E-04
Perchlorate	14797-73-	6.9E-03	23	3.0E-04		3.5E-03	1.5E-04	3.5E-03	1.5E-04
Phenanthrene	85-01-8	4.5E-02	760	5.9E-05		2.2E-02	3.0E-05	2.2E-02	3.0E-05
Phenol	108-95-2	4.2E-02	5,800	7.3E-06		2.1E-02	3.6E-06	2.1E-02	3.6E-06
Phosphorous	7723-14-0	1.5E+00	270	5.7E-03		7.7E-01	2.8E-03	7.7E-01	2.8E-03
Propanal	123-38-6	7.4E-01	110,000	6.7E-06		3.7E-01	3.4E-06	3.7E-01	3.4E-06
Propylbenzene	103-65-1	6.5E-02	5,400	1.2E-05		3.3E-02	6.0E-06	3.3E-02	6.0E-06
Propylene	115-07-1	7.0E-01	860,000	8.1E-07		3.5E-01	4.0E-07	3.5E-01	4.0E-07
Pyrene	129-00-0	3.2E-02	150	2.1E-04		1.6E-02	1.1E-04	1.6E-02	1.1E-04
Pyridine	110-86-1	1.2E-02	9,700	1.2E-06		5.8E-03	5.9E-07	5.8E-03	5.9E-07
Selenium	7782-49-2	2.2E-02	200	1.1E-04		1.1E-02	5.6E-05	1.1E-02	5.6E-05
Silver	7440-22-4	1.7E-02	100	1.7E-04		8.4E-03	8.4E-05	8.4E-03	8.4E-05
Styrene	100-42-5	1.8E-02	21,000	8.8E-07		9.2E-03	4.4E-07	9.2E-03	4.4E-07
TetraCDD, 2,3,7,8-	1746-01-6	3.3E-08	0.00003	1.1E-03		1.6E-08	5.4E-04	1.6E-08	5.4E-04
TetraCDF, 2,3,7,8-	51207-31-	5.7E-07	0.07	7.7E-06		2.8E-07	3.8E-06	2.8E-07	3.8E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	7.8E-03	240	3.2E-05		3.9E-03	1.6E-05	3.9E-03	1.6E-05

Source M-136 A and M-225 A, Acute HQs and HI for Boundary 1 with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Tetrachloroethane, 1,1,2,2-	79-34-5	6.0E-03	7,000	8.5E-07		3.0E-03	4.3E-07	3.0E-03	4.3E-07
Tetrachloroethylene	127-18-4	3.6E-02	20,000	1.8E-06		1.8E-02	8.9E-07	1.8E-02	8.9E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.0E-02	1,300	7.8E-06		5.1E-03	3.9E-06	5.1E-03	3.9E-06
Tetrahydrofuran	109-99-9	1.3E-02	290,000	4.4E-08		6.4E-03	2.2E-08	6.4E-03	2.2E-08
Toluene	108-88-3	4.0E-01	37,000	1.1E-05		2.0E-01	5.4E-06	2.0E-01	5.4E-06
Toluidine, o-	95-53-4	1.0E-01	8,800	1.1E-05		5.0E-02	5.7E-06	5.0E-02	5.7E-06
Trans-1,3-dichloropropene	10061-02-6	8.7E-03	75,000	1.2E-07		4.3E-03	5.8E-08	4.3E-03	5.8E-08
trans-2-Butene	624-64-6	1.1E-01	1,000,000	1.1E-07		5.5E-02	5.5E-08	5.5E-02	5.5E-08
Trichlorobenzene, 1,2,4-	120-82-1	9.2E-03	3,400	2.7E-06		4.6E-03	1.3E-06	4.6E-03	1.3E-06
Trichloroethane, 1,1,1-	71-55-6	3.8E-03	1,300,000	3.0E-09		1.9E-03	1.5E-09	1.9E-03	1.5E-09
Trichloroethane, 1,1,2-	79-00-5	1.0E-02	81,000	1.3E-07		5.2E-03	6.4E-08	5.2E-03	6.4E-08
Trichloroethylene	79-01-6	1.3E-02	700,000	1.9E-08		6.7E-03	9.5E-09	6.7E-03	9.5E-09
Trichlorophenol, 2,4,5-	95-95-4	2.0E-02	7,400	2.7E-06		1.0E-02	1.4E-06	1.0E-02	1.4E-06
Trichlorophenol, 2,4,6-	88-06-2	1.9E-02	1,800	1.0E-05		9.3E-03	5.2E-06	9.3E-03	5.2E-06
Trimethylbenzene, 1,3,5-	108-67-8	2.7E-01	690,000	3.9E-07		1.3E-01	2.0E-07	1.3E-01	2.0E-07
Trinitrobenzene, 1,3,5	99-35-4	7.8E-03	530	1.5E-05		3.9E-03	7.3E-06	3.9E-03	7.3E-06
Undecane	1120-21-4	1.7E-01	1,500	1.1E-04		8.5E-02	5.7E-05	8.5E-02	5.7E-05
Vinyl Chloride	75-01-4	1.1E-01	180,000	6.0E-07		5.4E-02	3.0E-07	5.4E-02	3.0E-07
Xylene, m-	108-38-3	1.6E-01	22,000	7.1E-06		7.8E-02	3.5E-06	7.8E-02	3.5E-06
Xylene, o-	95-47-6	1.8E-01	22,000	8.4E-06		9.2E-02	4.2E-06	9.2E-02	4.2E-06
Xylene, p-	106-42-3	1.6E-01	22,000	7.1E-06		7.8E-02	3.5E-06	7.8E-02	3.5E-06
Zinc	7440-66-6	7.8E-01	1,900	4.1E-04		3.9E-01	2.1E-04	3.9E-01	2.1E-04
			Total	**5.3**		**Total**	**2.7**	**With adjusted Ni & Cr**	**0.7**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	2.6E-03	690,000	3.8E-09		1.3E-03	1.9E-09	1.3E-03	1.9E-09
1,2,4-Trimethylbenzene	95-63-6	1.6E-01	690,000	2.3E-07		7.8E-02	1.1E-07	7.8E-02	1.1E-07
1,4-Diethylbenzene	105-05-5	4.2E-03	12,000	3.5E-07		2.1E-03	1.7E-07	2.1E-03	1.7E-07
1-Butene	106-98-9	1.4E-01	1,200,000	1.1E-07		6.9E-02	5.7E-08	6.9E-02	5.7E-08
1-Chloronapthalene	90-13-1	3.4E-03	4,600	7.5E-07		1.7E-03	3.7E-07	1.7E-03	3.7E-07
1-Naphthylamine	134-32-7	6.9E-02	210	3.3E-04		3.4E-02	1.6E-04	3.4E-02	1.6E-04
2,2,4-Trimethylpentane	540-84-1	1.5E-01	14,000,000	1.1E-08		7.5E-02	5.4E-09	7.5E-02	5.4E-09
2,2-Dimethylbutane	75-83-2	8.8E-03	1,800,000	4.9E-09		4.4E-03	2.4E-09	4.4E-03	2.4E-09
2,3,4-Trimethylpentane	565-75-3	5.1E-02	14,000,000	3.7E-09		2.6E-02	1.8E-09	2.6E-02	1.8E-09
2,3-Dimethylbutane	79-29-8	2.2E-02	1,800,000	1.2E-08		1.1E-02	6.1E-09	1.1E-02	6.1E-09
2,3-Dimethylpentane	565-59-3	8.8E-02	1,800,000	4.9E-08		4.4E-02	2.4E-08	4.4E-02	2.4E-08
2,4-Dimethylpentane	108-08-7	3.3E-02	180,000	1.8E-07		1.6E-02	9.0E-08	1.6E-02	9.0E-08
2,5-Dimethylbenzaldehyde	5779-94-2	1.7E-01	17,000	9.9E-06		8.4E-02	5.0E-06	8.4E-02	5.0E-06
2,6-Dichlorophenol	87-65-0	3.4E-03	8,800	3.9E-07		1.7E-03	1.9E-07	1.7E-03	1.9E-07
2-Ethyltoluene	611-14-3	2.8E-03	12,000	2.3E-07		1.4E-03	1.2E-07	1.4E-03	1.2E-07
2-Hexanone	591-78-6	1.3E-02	41,000	3.1E-07		6.2E-03	1.5E-07	6.2E-03	1.5E-07
2-Methylhexane	591-76-4	1.1E-01	1,800,000	5.9E-08		5.3E-02	2.9E-08	5.3E-02	2.9E-08
2-Methylnaphthalene	91-57-6	4.7E-02	3,000	1.6E-05		2.3E-02	7.8E-06	2.3E-02	7.8E-06
2-Methylpentane	107-83-5	6.9E-02	1,800,000	3.8E-08		3.4E-02	1.9E-08	3.4E-02	1.9E-08
2-Naphthylamine	91-59-8	6.9E-02	320	2.1E-04		3.4E-02	1.1E-04	3.4E-02	1.1E-04
3-Ethyltoluene	620-14-4	3.0E-02	12,000	2.5E-06		1.5E-02	1.2E-06	1.5E-02	1.2E-06
3-Methylheptane	589-81-1	2.2E-02	1,400,000	1.6E-08		1.1E-02	7.8E-09	1.1E-02	7.8E-09
3-Methylhexane	589-34-4	1.4E-01	1,800,000	7.6E-08		6.9E-02	3.8E-08	6.9E-02	3.8E-08
3-Methylpentane	96-14-0	4.4E-02	1,800,000	2.5E-08		2.2E-02	1.2E-08	2.2E-02	1.2E-08
4,6-Dinitro-2-methylphenol	534-52-1	6.0E-02	200	3.0E-04		3.0E-02	1.5E-04	3.0E-02	1.5E-04
4-Aminobyphenyl	92-67-1	6.9E-02	490	1.4E-04		3.4E-02	7.0E-05	3.4E-02	7.0E-05
4-Ethyltoluene	622-96-8	3.3E-02	12,000	2.8E-06		1.7E-02	1.4E-06	1.7E-02	1.4E-06
Acenaphthene	83-32-9	3.4E-03	3,600	9.5E-07		1.7E-03	4.8E-07	1.7E-03	4.8E-07
Acenaphthylene	208-96-8	1.9E-02	10,000	1.9E-06		9.6E-03	9.6E-07	9.6E-03	9.6E-07
Acetaldehyde	75-07-0	5.8E-01	470	1.2E-03		2.9E-01	6.2E-04	2.9E-01	6.2E-04
Acetone	67-64-1	1.5E-01	470,000	3.2E-07		7.5E-02	1.6E-07	7.5E-02	1.6E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetonitrile	75-05-8	1.2E-01	22,000	5.4E-06		5.9E-02	2.7E-06	5.9E-02	2.7E-06
Acetophenone	98-86-2	1.7E-02	10,000	1.7E-06		8.4E-03	8.4E-07	8.4E-03	8.4E-07
Acrylonitrile	107-13-1	1.0E-01	10,000	1.0E-05		5.0E-02	5.0E-06	5.0E-02	5.0E-06
Aluminum	7429-90-5	2.5E+02	3,000	8.2E-02		1.2E+02	4.1E-02	1.2E+02	4.1E-02
Aniline	62-53-3	5.0E-02	30,000	1.7E-06		2.5E-02	8.3E-07	2.5E-02	8.3E-07
Anthracene	120-12-7	8.1E-04	270	3.0E-06		4.1E-04	1.5E-06	4.1E-04	1.5E-06
Antimony	7440-36-0	1.8E-01	500	3.6E-04		9.1E-02	1.8E-04	9.1E-02	1.8E-04
Arsenic	7440-38-2	3.4E-03	0.20	1.7E-02		1.7E-03	8.4E-03	1.7E-03	8.4E-03
Barium	7440-39-3	2.4E-03	1,500	1.6E-06		1.2E-03	8.0E-07	1.2E-03	8.0E-07
Benzaldehyde	100-52-7	2.4E-01	17,000	1.4E-05		1.2E-01	7.0E-06	1.2E-01	7.0E-06
Benzene	71-43-2	7.5E-01	27	2.8E-02		3.7E-01	1.4E-02	3.7E-01	1.4E-02
Benzo(a)anthracene	56-55-3	3.6E-03	1,200	3.0E-06		1.8E-03	1.5E-06	1.8E-03	1.5E-06
Benzo(a)pyrene	50-32-8	4.8E-04	600	8.0E-07		2.4E-04	4.0E-07	2.4E-04	4.0E-07
Benzo(b)fluoranthene	205-99-2	7.2E-03	31	2.3E-04		3.6E-03	1.2E-04	3.6E-03	1.2E-04
Benzo(g,h,i)perylene	191-24-2	2.8E-03	30,000	9.3E-08		1.4E-03	4.6E-08	1.4E-03	4.6E-08
Benzo(k)fluoranthene	207-08-9	7.1E-03	19	3.8E-04		3.6E-03	1.9E-04	3.6E-03	1.9E-04
Benzoic acid	65-85-0	3.9E-01	2,800	1.4E-04		1.9E-01	7.0E-05	1.9E-01	7.0E-05
Benzyl alcohol	100-51-6	4.9E-03	130,000	3.7E-08		2.4E-03	1.9E-08	2.4E-03	1.9E-08
Benzyl chloride	100-44-7	3.6E-03	240	1.5E-05		1.8E-03	7.4E-06	1.8E-03	7.4E-06
Bis(2-chlorethyl)ether	111-44-4	3.8E-03	58,000	6.6E-08		1.9E-03	3.3E-08	1.9E-03	3.3E-08
Bis(2-chloroethoxy)methane	111-91-1	3.4E-03	920	3.7E-06		1.7E-03	1.9E-06	1.7E-03	1.9E-06
Bromodichloromethane	75-27-4	4.9E-03	260	1.9E-05		2.4E-03	9.4E-06	2.4E-03	9.4E-06
Bromoform	75-25-2	8.1E-03	15,000	5.4E-07		4.1E-03	2.7E-07	4.1E-03	2.7E-07
Bromophenyl-phenylether, 4-	101-55-3	3.4E-03	290	1.2E-05		1.7E-03	5.9E-06	1.7E-03	5.9E-06
Butylbenzylphthalate	85-68-7	9.4E-04	15,000	6.3E-08		4.7E-04	3.1E-08	4.7E-04	3.1E-08
Cadmium	7440-43-9	2.9E-04	100	2.9E-06		1.4E-04	1.4E-06	1.4E-04	1.4E-06
Carbazole	86-74-8	4.4E-03	660	6.6E-06		2.2E-03	3.3E-06	2.2E-03	3.3E-06
Carbon disulfide	75-15-0	6.1E-02	6,200	9.9E-06		3.1E-02	4.9E-06	3.1E-02	4.9E-06
Carbon tetrachloride	56-23-5	9.4E-02	1,900	4.9E-05		4.7E-02	2.5E-05	4.7E-02	2.5E-05
Chlorine	7782-50-5	7.4E+01	210	3.5E-01		3.7E+01	1.8E-01	3.7E+01	1.8E-01
Chloro-3-methylphenol, 4-	59-50-7	4.2E-03	5,500	7.7E-07		2.1E-03	3.9E-07	2.1E-03	3.9E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroacetonitrile	107-14-2	6.9E-03	9,000	7.6E-07		3.4E-03	3.8E-07	3.4E-03	3.8E-07
Chloroaniline, p-	106-47-8	9.7E-04	2,200	4.4E-07		4.8E-04	2.2E-07	4.8E-04	2.2E-07
Chlorobenzene	108-90-7	1.6E-02	46,000	3.4E-07		7.8E-03	1.7E-07	7.8E-03	1.7E-07
Chloroethane	75-00-3	2.8E-03	260,000	1.1E-08		1.4E-03	5.3E-09	1.4E-03	5.3E-09
Chloroform (Trichloromethane)	67-66-3	3.8E-02	150	2.5E-04		1.9E-02	1.3E-04	1.9E-02	1.3E-04
Chloronaphthalene,2-	91-58-7	3.4E-03	600	5.7E-06		1.7E-03	2.9E-06	1.7E-03	2.9E-06
Chlorophenol, 2-	95-57-8	1.2E-02	1,300	9.2E-06		6.0E-03	4.6E-06	6.0E-03	4.6E-06
Chromium III	7440-47-3	6.8E-02	1,500	4.5E-05		3.4E-02	2.2E-05	1.7E-03	1.1E-06
Chromium, hexavalent	18540-29-9	5.5E-02	89	6.2E-04		2.8E-02	3.1E-04	1.4E-03	1.5E-05
Chrysene	218-01-9	4.5E-03	600	7.5E-06		2.3E-03	3.8E-06	2.3E-03	3.8E-06
Cis-1,3-dichloropropene	10062-01-5	8.1E-03	600	1.4E-05		4.1E-03	6.8E-06	4.1E-03	6.8E-06
cis-2-Butene	590-18-1	1.1E-02	150,000,000	7.1E-11		5.3E-03	3.5E-11	5.3E-03	3.5E-11
Cobalt	7440-48-4	7.4E-04	180	4.1E-06		3.7E-04	2.0E-06	3.7E-04	2.0E-06
Copper	7440-50-8	1.5E-01	100	1.5E-03		7.7E-02	7.7E-04	7.7E-02	7.7E-04
Cresol, m-	108-39-4	8.0E-04	20,000	4.0E-08		4.0E-04	2.0E-08	4.0E-04	2.0E-08
Cresol, o-	95-48-7	2.1E-02	20,000	1.0E-06		1.0E-02	5.1E-07	1.0E-02	5.1E-07
Cresol, p-	106-44-5	8.0E-04	20,000	4.0E-08		4.0E-04	2.0E-08	4.0E-04	2.0E-08
Crotonaldehyde	4170-30-3	2.0E-02	540	3.7E-05		1.0E-02	1.8E-05	1.0E-02	1.8E-05
Cumene	98-82-8	2.6E-03	250,000	1.1E-08		1.3E-03	5.2E-09	1.3E-03	5.2E-09
Cyclohexane	110-82-7	1.6E-02	340,000	4.6E-08		7.8E-03	2.3E-08	7.8E-03	2.3E-08
Dibenz(a,h)anthracene	53-70-3	6.3E-04	34	1.9E-05		3.2E-04	9.3E-06	3.2E-04	9.3E-06
Dibenzofuran	132-64-9	3.4E-03	30,000	1.1E-07		1.7E-03	5.7E-08	1.7E-03	5.7E-08
Dibromochloromethane	124-48-1	5.5E-03	7,400	7.4E-07		2.7E-03	3.7E-07	2.7E-03	3.7E-07
Dichlorobenzene, 1,2-	95-50-1	3.5E-03	300,000	1.2E-08		1.7E-03	5.8E-09	1.7E-03	5.8E-09
Dichlorobenzene, 1,3-	541-73-1	3.9E-03	16,000	2.4E-07		1.9E-03	1.2E-07	1.9E-03	1.2E-07
Dichlorobenzene,1,4-	106-46-7	3.6E-03	60,000	6.1E-08		1.8E-03	3.0E-08	1.8E-03	3.0E-08
Dichloroethane 1,1-	75-34-3	2.0E-03	650,000	3.1E-09		1.0E-03	1.5E-09	1.0E-03	1.5E-09
Dichloroethane, 1,2	107-06-2	3.4E-03	200,000	1.7E-08		1.7E-03	8.4E-09	1.7E-03	8.4E-09
Dichloroethylene 1,1-	75-35-4	2.7E-03	180,000	1.5E-08		1.3E-03	7.5E-09	1.3E-03	7.5E-09
Dichloroethylene, cis-1,2-	156-59-2	7.5E-04	560,000	1.3E-09		3.7E-04	6.7E-10	3.7E-04	6.7E-10
Dichloroethylene-1,2 (trans)	156-60-5	4.5E-03	1,100,000	4.1E-09		2.2E-03	2.0E-09	2.2E-03	2.0E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorophenol, 2,4-	120-83-2	5.8E-03	1,300	4.5E-06		2.9E-03	2.2E-06	2.9E-03	2.2E-06
Dichloropropane, 1,2-	78-87-5	2.3E-03	140,000	1.7E-08		1.2E-03	8.2E-09	1.2E-03	8.2E-09
Diethyl phthalate	84-66-2	5.0E-03	5,000	1.0E-06		2.5E-03	5.0E-07	2.5E-03	5.0E-07
Dimethyl phthalate	131-11-3	3.4E-03	15,000	2.3E-07		1.7E-03	1.1E-07	1.7E-03	1.1E-07
Dimethylphenol, 2,4-	105-67-9	4.3E-02	4,500	9.6E-06		2.2E-02	4.8E-06	2.2E-02	4.8E-06
Di-n-butyl phthalate	84-74-2	6.9E-02	15,000	4.6E-06		3.4E-02	2.3E-06	3.4E-02	2.3E-06
Dinitrobenzene, 1,3-	99-65-0	3.6E-03	1,000	3.6E-06		1.8E-03	1.8E-06	1.8E-03	1.8E-06
Dinitrophenol, 2,4-	51-28-5	1.5E-01	220	6.9E-04		7.5E-02	3.4E-04	7.5E-02	3.4E-04
Dinitrotoluene, 2,4-	121-14-2	3.4E-03	600	5.7E-06		1.7E-03	2.9E-06	1.7E-03	2.9E-06
Dinitrotoluene, 2,6-	606-20-2	3.5E-03	600	5.9E-06		1.8E-03	2.9E-06	1.8E-03	2.9E-06
Di-n-octylphthalate	117-84-0	2.3E-02	6,800	3.4E-06		1.2E-02	1.7E-06	1.2E-02	1.7E-06
Dioxane, 1,4-	123-91-1	4.0E-03	3,000	1.3E-06		2.0E-03	6.7E-07	2.0E-03	6.7E-07
Diphenylamine	122-39-4	3.4E-03	30,000	1.1E-07		1.7E-03	5.7E-08	1.7E-03	5.7E-08
Ethyl methacrylate	97-63-2	1.0E-02	13,000	7.7E-07		5.0E-03	3.8E-07	5.0E-03	3.8E-07
Ethylbenzene	100-41-4	6.9E-02	140,000	4.9E-07		3.4E-02	2.5E-07	3.4E-02	2.5E-07
Ethylene Dibromide	106-93-4	5.6E-03	130,000	4.3E-08		2.8E-03	2.1E-08	2.8E-03	2.1E-08
Ethylether	60-29-7	1.6E-02	1,500,000	1.0E-08		7.8E-03	5.2E-09	7.8E-03	5.2E-09
Ethylhexyl phthalate, bis-2-	117-81-7	7.3E-03	10,000	7.3E-07		3.6E-03	3.6E-07	3.6E-03	3.6E-07
Fluoranthene	206-44-0	1.6E-02	1,500	1.1E-05		8.2E-03	5.5E-06	8.2E-03	5.5E-06
Fluorene	86-73-7	4.1E-03	6,600	6.2E-07		2.0E-03	3.1E-07	2.0E-03	3.1E-07
Formaldehyde	50-00-0	2.9E-01	55	5.3E-03		1.5E-01	2.7E-03	1.5E-01	2.7E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	1.8E-07	3	6.0E-08		9.0E-08	3.0E-08	9.0E-08	3.0E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	4.5E-06	45	1.0E-07		2.3E-06	5.0E-08	2.3E-06	5.0E-08
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.2E-06	60	2.0E-08		5.9E-07	9.8E-09	5.9E-07	9.8E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	2.2E-08	0.07	2.9E-07		1.1E-08	1.5E-07	1.1E-08	1.5E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	5.5E-08	0.75	7.4E-08		2.8E-08	3.7E-08	2.8E-08	3.7E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	3.8E-08	4	9.7E-09		1.9E-08	4.8E-09	1.9E-08	4.8E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	1.6E-06	0.07	2.2E-05		8.0E-07	1.1E-05	8.0E-07	1.1E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	9.9E-07	0.04	2.7E-05		5.0E-07	1.3E-05	5.0E-07	1.3E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	7.4E-07	30	2.5E-08		3.7E-07	1.2E-08	3.7E-07	1.2E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.2E-06	0.49	2.4E-06		5.9E-07	1.2E-06	5.9E-07	1.2E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Hexachloro-1,3-butadiene	87-68-3	5.1E-03	11,000	4.6E-07		2.5E-03	2.3E-07	2.5E-03	2.3E-07
Hexachlorobenzene	118-74-1	2.9E-02	6	4.9E-03		1.5E-02	2.4E-03	1.5E-02	2.4E-03
Hexachlorocyclopentadiene	77-47-4	6.9E-02	110	6.3E-04		3.4E-02	3.1E-04	3.4E-02	3.1E-04
Hexachloroethane (Perchloroethane)	67-72-1	3.7E-03	29,000	1.3E-07		1.8E-03	6.4E-08	1.8E-03	6.4E-08
Hexachloropropene	1888-71-7	4.9E-03	905	5.5E-06		2.5E-03	2.7E-06	2.5E-03	2.7E-06
Hexane	110-54-3	6.1E-02	1,100,000	5.6E-08		3.1E-02	2.8E-08	3.1E-02	2.8E-08
Hydrogen chloride	7647-01-0	1.1E+02	2,100	5.3E-02		5.6E+01	2.6E-02	5.6E+01	2.6E-02
Indeno(1,2,3-cd) pyrene	193-39-5	2.4E-03	15	1.6E-04		1.2E-03	8.1E-05	1.2E-03	8.1E-05
Isophorone	78-59-1	3.4E-03	23,000	1.5E-07		1.7E-03	7.4E-08	1.7E-03	7.4E-08
Lead	7439-92-1	2.5E-01	150	1.7E-03		1.3E-01	8.4E-04	1.3E-01	8.4E-04
Manganese	7439-96-5	5.8E-01	3,000	1.9E-04		2.9E-01	9.6E-05	2.9E-01	9.6E-05
Mercuric chloride	7487-94-7	3.3E-05	2,700	1.2E-08		1.7E-05	6.1E-09	1.7E-05	6.1E-09
Methacrylonitrile	126-98-7	3.7E-02	2,700	1.4E-05		1.8E-02	6.8E-06	1.8E-02	6.8E-06
Methyl bromide	74-83-9	7.5E-04	3,900	1.9E-07		3.7E-04	9.6E-08	3.7E-04	9.6E-08
Methyl chloride	74-87-3	8.8E-02	210,000	4.2E-07		4.4E-02	2.1E-07	4.4E-02	2.1E-07
Methyl ethyl ketone	78-93-3	2.4E-02	13,000	1.9E-06		1.2E-02	9.4E-07	1.2E-02	9.4E-07
Methyl isobutyl ketone	108-10-1	5.1E-03	310,000	1.7E-08		2.6E-03	8.3E-09	2.6E-03	8.3E-09
Methyl tert-butyl ether	1634-04-4	8.1E-02	180,000	4.5E-07		4.1E-02	2.3E-07	4.1E-02	2.3E-07
Methylcyclohexane	108-87-2	7.5E-02	1,600,000	4.7E-08		3.7E-02	2.3E-08	3.7E-02	2.3E-08
Methylene chloride	75-09-2	1.5E+00	14,000	1.1E-04		7.5E-01	5.4E-05	7.5E-01	5.4E-05
Methylmethacrylate	80-62-6	1.0E-02	70,000	1.4E-07		5.0E-03	7.1E-08	5.0E-03	7.1E-08
Naphthalene	91-20-3	5.7E-01	79,000	7.3E-06		2.9E-01	3.6E-06	2.9E-01	3.6E-06
Nickel	7440-02-0	3.6E-01	0.20	1.8E+00		1.8E-01	8.9E-01	3.1E-03	1.5E-02
Nitroaniline, 2-	88-74-4	3.4E-03	4,800	7.1E-07		1.7E-03	3.6E-07	1.7E-03	3.6E-07
Nitroaniline, 3-	99-09-2	1.4E-02	110	1.2E-04		6.8E-03	6.2E-05	6.8E-03	6.2E-05
Nitroaniline, 4-	100-01-6	1.4E-02	9,000	1.5E-06		6.8E-03	7.6E-07	6.8E-03	7.6E-07
Nitrobenzene	98-95-3	3.9E-03	9,100	4.3E-07		1.9E-03	2.1E-07	1.9E-03	2.1E-07
Nitrophenol, 2-	88-75-5	2.9E-02	1,000	2.9E-05		1.5E-02	1.5E-05	1.5E-02	1.5E-05
Nitrophenol, 4-	100-02-7	2.3E-02	1,200	1.9E-05		1.1E-02	9.4E-06	1.1E-02	9.4E-06
Nitroso-di-n-butylamine, n-	924-16-3	3.4E-03	2,000	1.7E-06		1.7E-03	8.6E-07	1.7E-03	8.6E-07
Nitrosodiphenylamine, N-	86-30-6	6.1E-04	1,400	4.4E-07		3.0E-04	2.2E-07	3.0E-04	2.2E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Nitrosodipropylamine, n-	621-64-7	3.4E-03	2,000	1.7E-06		1.7E-03	8.6E-07	1.7E-03	8.6E-07
n-Nitrosodiethylamine	55-18-5	3.4E-03	1,700	2.0E-06		1.7E-03	1.0E-06	1.7E-03	1.0E-06
n-Nitrosodimethylamine	62-75-9	3.5E-03	1,700	2.1E-06		1.7E-03	1.0E-06	1.7E-03	1.0E-06
n-Nitrosomethylethylamine	10595-95-6	5.7E-03	1,700	3.3E-06		2.8E-03	1.7E-06	2.8E-03	1.7E-06
n-Nitrosomorpholine	59-89-2	3.4E-03	74	4.6E-05		1.7E-03	2.3E-05	1.7E-03	2.3E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.3E-07	3	7.6E-08		1.1E-07	3.8E-08	1.1E-07	3.8E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	3.3E-06	75	4.4E-08		1.6E-06	2.2E-08	1.6E-06	2.2E-08
o-Tolualdehyde	529-20-4	2.5E-01	17,000	1.5E-05		1.2E-01	7.3E-06	1.2E-01	7.3E-06
p-Dimethylaminoazobenzene	60-11-7	3.4E-03	670	5.1E-06		1.7E-03	2.5E-06	1.7E-03	2.5E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	4.2E-08	0.10	4.2E-07		2.1E-08	2.1E-07	2.1E-08	2.1E-07
PentaCDF, 1,2,3,7,8-	57117-41-6	5.0E-07	0.24	2.1E-06		2.5E-07	1.0E-06	2.5E-07	1.0E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	9.9E-07	0.07	1.3E-05		5.0E-07	6.7E-06	5.0E-07	6.7E-06
Pentachlorobenzene	608-93-5	3.4E-03	1,600	2.1E-06		1.7E-03	1.1E-06	1.7E-03	1.1E-06
Pentachloroethane	76-01-7	4.4E-03	320,000	1.4E-08		2.2E-03	6.8E-09	2.2E-03	6.8E-09
Pentachloronitrobenzene	82-68-8	3.6E-03	1,500	2.4E-06		1.8E-03	1.2E-06	1.8E-03	1.2E-06
Pentachlorophenol	87-86-5	1.7E-01	1,400	1.2E-04		8.6E-02	6.1E-05	8.6E-02	6.1E-05
Perchlorate	14797-73-0	3.0E-03	23	1.3E-04		1.5E-03	6.6E-05	1.5E-03	6.6E-05
Phenanthrene	85-01-8	2.0E-02	760	2.6E-05		9.9E-03	1.3E-05	9.9E-03	1.3E-05
Phenol	108-95-2	1.9E-02	5,800	3.2E-06		9.3E-03	1.6E-06	9.3E-03	1.6E-06
Phosphorous	7723-14-0	6.8E-01	270	2.5E-03		3.4E-01	1.2E-03	3.4E-01	1.2E-03
Propanal	123-38-6	3.3E-01	110,000	3.0E-06		1.6E-01	1.5E-06	1.6E-01	1.5E-06
Propylbenzene	103-65-1	2.9E-02	5,400	5.3E-06		1.4E-02	2.7E-06	1.4E-02	2.7E-06
Propylene	115-07-1	3.1E-01	860,000	3.6E-07		1.5E-01	1.8E-07	1.5E-01	1.8E-07
Pyrene	129-00-0	1.4E-02	150	9.4E-05		7.0E-03	4.7E-05	7.0E-03	4.7E-05
Pyridine	110-86-1	5.1E-03	9,700	5.2E-07		2.5E-03	2.6E-07	2.5E-03	2.6E-07
Selenium	7782-49-2	9.8E-03	200	4.9E-05		4.9E-03	2.5E-05	4.9E-03	2.5E-05
Silver	7440-22-4	7.4E-03	100	7.4E-05		3.7E-03	3.7E-05	3.7E-03	3.7E-05
Styrene	100-42-5	8.1E-03	21,000	3.9E-07		4.1E-03	1.9E-07	4.1E-03	1.9E-07
TetraCDD, 2,3,7,8-	1746-01-6	1.4E-08	0.00003	4.8E-04		7.2E-09	2.4E-04	7.2E-09	2.4E-04
TetraCDF, 2,3,7,8-	51207-31-9	2.5E-07	0.07	3.4E-06		1.2E-07	1.7E-06	1.2E-07	1.7E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	3.4E-03	240	1.4E-05		1.7E-03	7.1E-06	1.7E-03	7.1E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Tetrachloroethane, 1,1,2,2-	79-34-5	2.6E-03	7,000	3.8E-07		1.3E-03	1.9E-07	1.3E-03	1.9E-07
Tetrachloroethylene	127-18-4	1.6E-02	20,000	7.8E-07		7.8E-03	3.9E-07	7.8E-03	3.9E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	4.5E-03	1,300	3.4E-06		2.2E-03	1.7E-06	2.2E-03	1.7E-06
Tetrahydrofuran	109-99-9	5.6E-03	290,000	1.9E-08		2.8E-03	9.7E-09	2.8E-03	9.7E-09
Toluene	108-88-3	1.8E-01	37,000	4.7E-06		8.7E-02	2.4E-06	8.7E-02	2.4E-06
Toluidine, o-	95-53-4	4.4E-02	8,800	5.0E-06		2.2E-02	2.5E-06	2.2E-02	2.5E-06
Trans-1,3-dichloropropene	10061-02-6	3.8E-03	75,000	5.1E-08		1.9E-03	2.5E-08	1.9E-03	2.5E-08
trans-2-Butene	624-64-6	4.8E-02	1,000,000	4.8E-08		2.4E-02	2.4E-08	2.4E-02	2.4E-08
Trichlorobenzene, 1,2,4-	120-82-1	4.0E-03	3,400	1.2E-06		2.0E-03	5.9E-07	2.0E-03	5.9E-07
Trichloroethane, 1,1,1-	71-55-6	1.7E-03	1,300,000	1.3E-09		8.4E-04	6.5E-10	8.4E-04	6.5E-10
Trichloroethane, 1,1,2-	79-00-5	4.6E-03	81,000	5.6E-08		2.3E-03	2.8E-08	2.3E-03	2.8E-08
Trichloroethylene	79-01-6	5.9E-03	700,000	8.4E-09		2.9E-03	4.2E-09	2.9E-03	4.2E-09
Trichlorophenol, 2,4,5-	95-95-4	8.9E-03	7,400	1.2E-06		4.4E-03	6.0E-07	4.4E-03	6.0E-07
Trichlorophenol, 2,4,6-	88-06-2	8.2E-03	1,800	4.6E-06		4.1E-03	2.3E-06	4.1E-03	2.3E-06
Trimethylbenzene, 1,3,5-	108-67-8	1.2E-01	690,000	1.7E-07		5.9E-02	8.6E-08	5.9E-02	8.6E-08
Trinitrobenzene, 1,3,5	99-35-4	3.4E-03	530	6.5E-06		1.7E-03	3.2E-06	1.7E-03	3.2E-06
Undecane	1120-21-4	7.5E-02	1,500	5.0E-05		3.7E-02	2.5E-05	3.7E-02	2.5E-05
Vinyl Chloride	75-01-4	4.8E-02	180,000	2.6E-07		2.4E-02	1.3E-07	2.4E-02	1.3E-07
Xylene, m-	108-38-3	6.9E-02	22,000	3.1E-06		3.4E-02	1.6E-06	3.4E-02	1.6E-06
Xylene, o-	95-47-6	8.1E-02	22,000	3.7E-06		4.1E-02	1.8E-06	4.1E-02	1.8E-06
Xylene, p-	106-42-3	6.9E-02	22,000	3.1E-06		3.4E-02	1.6E-06	3.4E-02	1.6E-06
Zinc	7440-66-6	3.4E-01	1,900	1.8E-04		1.7E-01	9.0E-05	1.7E-01	9.0E-05
			Total	**2.3**		**Total**	**1.2**	**With adjusted Ni & Cr**	**0.3**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225-A, Acute HQs and HI Boundary 3, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	8.5E-04	690,000	1.2E-09		4.2E-04	6.1E-10	4.2E-04	6.1E-10
1,2,4-Trimethylbenzene	95-63-6	5.1E-02	690,000	7.3E-08		2.5E-02	3.7E-08	2.5E-02	3.7E-08
1,4-Diethylbenzene	105-05-5	1.4E-03	12,000	1.1E-07		6.8E-04	5.6E-08	6.8E-04	5.6E-08
1-Butene	106-98-9	4.4E-02	1,200,000	3.7E-08		2.2E-02	1.9E-08	2.2E-02	1.9E-08
1-Chloronapthalene	90-13-1	1.1E-03	4,600	2.4E-07		5.5E-04	1.2E-07	5.5E-04	1.2E-07
1-Naphthylamine	134-32-7	2.2E-02	210	1.1E-04		1.1E-02	5.3E-05	1.1E-02	5.3E-05
2,2,4-Trimethylpentane	540-84-1	4.9E-02	14,000,000	3.5E-09		2.4E-02	1.7E-09	2.4E-02	1.7E-09
2,2-Dimethylbutane	75-83-2	2.8E-03	1,800,000	1.6E-09		1.4E-03	7.8E-10	1.4E-03	7.8E-10
2,3,4-Trimethylpentane	565-75-3	1.7E-02	14,000,000	1.2E-09		8.3E-03	5.9E-10	8.3E-03	5.9E-10
2,3-Dimethylbutane	79-29-8	7.1E-03	1,800,000	3.9E-09		3.5E-03	2.0E-09	3.5E-03	2.0E-09
2,3-Dimethylpentane	565-59-3	2.8E-02	1,800,000	1.6E-08		1.4E-02	7.8E-09	1.4E-02	7.8E-09
2,4-Dimethylpentane	108-08-7	1.1E-02	180,000	5.8E-08		5.2E-03	2.9E-08	5.2E-03	2.9E-08
2,5-Dimethylbenzaldehyde	5779-94-2	5.5E-02	17,000	3.2E-06		2.7E-02	1.6E-06	2.7E-02	1.6E-06
2,6-Dichlorophenol	87-65-0	1.1E-03	8,800	1.3E-07		5.5E-04	6.3E-08	5.5E-04	6.3E-08
2-Ethyltoluene	611-14-3	9.1E-04	12,000	7.6E-08		4.5E-04	3.8E-08	4.5E-04	3.8E-08
2-Hexanone	591-78-6	4.0E-03	41,000	9.9E-08		2.0E-03	4.9E-08	2.0E-03	4.9E-08
2-Methylhexane	591-76-4	3.4E-02	1,800,000	1.9E-08		1.7E-02	9.5E-09	1.7E-02	9.5E-09
2-Methylnaphthalene	91-57-6	1.5E-02	3,000	5.0E-06		7.5E-03	2.5E-06	7.5E-03	2.5E-06
2-Methylpentane	107-83-5	2.2E-02	1,800,000	1.2E-08		1.1E-02	6.2E-09	1.1E-02	6.2E-09
2-Naphthylamine	91-59-8	2.2E-02	320	6.9E-05		1.1E-02	3.4E-05	1.1E-02	3.4E-05
3-Ethyltoluene	620-14-4	9.7E-03	12,000	8.1E-07		4.8E-03	4.0E-07	4.8E-03	4.0E-07
3-Methylheptane	589-81-1	7.1E-03	1,400,000	5.1E-09		3.5E-03	2.5E-09	3.5E-03	2.5E-09
3-Methylhexane	589-34-4	4.4E-02	1,800,000	2.5E-08		2.2E-02	1.2E-08	2.2E-02	1.2E-08
3-Methylpentane	96-14-0	1.4E-02	1,800,000	8.0E-09		7.2E-03	4.0E-09	7.2E-03	4.0E-09
4,6-Dinitro-2-methylphenol	534-52-1	1.9E-02	200	9.6E-05		9.6E-03	4.8E-05	9.6E-03	4.8E-05
4-Aminobyphenyl	92-67-1	2.2E-02	490	4.5E-05		1.1E-02	2.3E-05	1.1E-02	2.3E-05
4-Ethyltoluene	622-96-8	1.1E-02	12,000	8.9E-07		5.3E-03	4.5E-07	5.3E-03	4.5E-07
Acenaphthene	83-32-9	1.1E-03	3,600	3.1E-07		5.5E-04	1.5E-07	5.5E-04	1.5E-07
Acenaphthylene	208-96-8	6.2E-03	10,000	6.2E-07		3.1E-03	3.1E-07	3.1E-03	3.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	1.9E-01	470	4.0E-04		9.4E-02	2.0E-04	9.4E-02	2.0E-04
Acetone	67-64-1	4.9E-02	470,000	1.0E-07		2.4E-02	5.2E-08	2.4E-02	5.2E-08
Acetonitrile	75-05-8	3.8E-02	22,000	1.7E-06		1.9E-02	8.7E-07	1.9E-02	8.7E-07
Acetophenone	98-86-2	5.4E-03	10,000	5.4E-07		2.7E-03	2.7E-07	2.7E-03	2.7E-07
Acrylonitrile	107-13-1	3.2E-02	10,000	3.2E-06		1.6E-02	1.6E-06	1.6E-02	1.6E-06
Aluminum	7429-90-5	7.7E+01	3,000	2.6E-02		3.8E+01	1.3E-02	3.8E+01	1.3E-02
Aniline	62-53-3	1.6E-02	30,000	5.4E-07		8.1E-03	2.7E-07	8.1E-03	2.7E-07
Anthracene	120-12-7	2.6E-04	270	9.7E-07		1.3E-04	4.9E-07	1.3E-04	4.9E-07
Antimony	7440-36-0	5.9E-02	500	1.2E-04		2.9E-02	5.9E-05	2.9E-02	5.9E-05
Arsenic	7440-38-2	1.1E-03	0.2	5.3E-03		5.3E-04	2.6E-03	5.3E-04	2.6E-03
Barium	7440-39-3	7.5E-04	1,500	5.0E-07		3.7E-04	2.5E-07	3.7E-04	2.5E-07
Benzaldehyde	100-52-7	7.7E-02	17,000	4.5E-06		3.8E-02	2.3E-06	3.8E-02	2.3E-06
Benzene	71-43-2	2.4E-01	27	9.0E-03		1.2E-01	4.5E-03	1.2E-01	4.5E-03
Benzo(a)anthracene	56-55-3	1.2E-03	1,200	9.7E-07		5.8E-04	4.8E-07	5.8E-04	4.8E-07
Benzo(a)pyrene	50-32-8	1.5E-04	600	2.5E-07		7.6E-05	1.3E-07	7.6E-05	1.3E-07
Benzo(b)fluoranthene	205-99-2	2.3E-03	31	7.5E-05		1.2E-03	3.7E-05	1.2E-03	3.7E-05
Benzo(g,h,i)perylene	191-24-2	8.7E-04	30,000	2.9E-08		4.3E-04	1.4E-08	4.3E-04	1.4E-08
Benzo(k)fluoranthene	207-08-9	2.3E-03	19	1.2E-04		1.1E-03	5.9E-05	1.1E-03	5.9E-05
Benzoic acid	65-85-0	1.3E-01	2,800	4.5E-05		6.3E-02	2.2E-05	6.3E-02	2.2E-05
Benzyl alcohol	100-51-6	1.6E-03	130,000	1.2E-08		7.8E-04	6.0E-09	7.8E-04	6.0E-09
Benzyl chloride	100-44-7	1.2E-03	240	4.8E-06		5.8E-04	2.4E-06	5.8E-04	2.4E-06
Bis(2-chlorethyl)ether	111-44-4	1.2E-03	58,000	2.1E-08		6.2E-04	1.1E-08	6.2E-04	1.1E-08
Bis(2-chloroethoxy)methane	111-91-1	1.1E-03	920	1.2E-06		5.5E-04	6.0E-07	5.5E-04	6.0E-07
Bromodichloromethane	75-27-4	1.6E-03	260	6.1E-06		7.9E-04	3.0E-06	7.9E-04	3.0E-06
Bromoform	75-25-2	2.6E-03	15,000	1.8E-07		1.3E-03	8.7E-08	1.3E-03	8.7E-08
Bromophenyl-phenylether, 4-	101-55-3	1.1E-03	290	3.8E-06		5.5E-04	1.9E-06	5.5E-04	1.9E-06
Butylbenzylphthalate	85-68-7	3.0E-04	15,000	2.0E-08		1.5E-04	1.0E-08	1.5E-04	1.0E-08
Cadmium	7440-43-9	9.0E-05	100	9.0E-07		4.5E-05	4.5E-07	4.5E-05	4.5E-07
Carbazole	86-74-8	1.4E-03	660	2.1E-06		7.1E-04	1.1E-06	7.1E-04	1.1E-06

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	2.0E-02	6,200	3.2E-06		9.9E-03	1.6E-06	9.9E-03	1.6E-06
Carbon tetrachloride	56-23-5	3.0E-02	1,900	1.6E-05		1.5E-02	8.0E-06	1.5E-02	8.0E-06
Chlorine	7782-50-5	2.4E+01	210	1.1E-01		1.2E+01	5.7E-02	1.2E+01	5.7E-02
Chloro-3-methylphenol, 4-	59-50-7	1.4E-03	5,500	2.5E-07		6.9E-04	1.2E-07	6.9E-04	1.2E-07
Chloroacetonitrile	107-14-2	2.2E-03	9,000	2.5E-07		1.1E-03	1.2E-07	1.1E-03	1.2E-07
Chloroaniline, p-	106-47-8	3.1E-04	2,200	1.4E-07		1.6E-04	7.1E-08	1.6E-04	7.1E-08
Chlorobenzene	108-90-7	5.1E-03	46,000	1.1E-07		2.5E-03	5.5E-08	2.5E-03	5.5E-08
Chloroethane	75-00-3	8.9E-04	260,000	3.4E-09		4.4E-04	1.7E-09	4.4E-04	1.7E-09
Chloroform (Trichloromethane)	67-66-3	1.2E-02	150	8.2E-05		6.2E-03	4.1E-05	6.2E-03	4.1E-05
Chloronaphthalene,2-	91-58-7	1.1E-03	600	1.8E-06		5.5E-04	9.2E-07	5.5E-04	9.2E-07
Chlorophenol, 2-	95-57-8	3.9E-03	1,300	3.0E-06		1.9E-03	1.5E-06	1.9E-03	1.5E-06
Chromium III	7440-47-3	2.1E-02	1,500	1.4E-05		1.1E-02	7.0E-06	5.3E-04	3.5E-07
Chromium, hexavalent	18540-29-9	1.7E-02	89	1.9E-04		8.6E-03	9.7E-05	4.3E-04	4.8E-06
Chrysene	218-01-9	1.4E-03	600	2.4E-06		7.2E-04	1.2E-06	7.2E-04	1.2E-06
Cis-1,3-dichloropropene	10062-01-5	2.6E-03	600	4.4E-06		1.3E-03	2.2E-06	1.3E-03	2.2E-06
cis-2-Butene	590-18-1	3.4E-03	150,000,000	2.3E-11		1.7E-03	1.1E-11	1.7E-03	1.1E-11
Cobalt	7440-48-4	2.3E-04	180	1.3E-06		1.1E-04	6.4E-07	1.1E-04	6.4E-07
Copper	7440-50-8	4.8E-02	100	4.8E-04		2.4E-02	2.4E-04	2.4E-02	2.4E-04
Cresol, m-	108-39-4	2.6E-04	20,000	1.3E-08		1.3E-04	6.5E-09	1.3E-04	6.5E-09
Cresol, o-	95-48-7	6.7E-03	20,000	3.3E-07		3.3E-03	1.7E-07	3.3E-03	1.7E-07
Cresol, p-	106-44-5	2.6E-04	20,000	1.3E-08		1.3E-04	6.5E-09	1.3E-04	6.5E-09
Crotonaldehyde	4170-30-3	6.5E-03	540	1.2E-05		3.2E-03	6.0E-06	3.2E-03	6.0E-06
Cumene	98-82-8	8.5E-04	250,000	3.4E-09		4.2E-04	1.7E-09	4.2E-04	1.7E-09
Cyclohexane	110-82-7	5.1E-03	340,000	1.5E-08		2.5E-03	7.4E-09	2.5E-03	7.4E-09
Dibenz(a,h)anthracene	53-70-3	2.0E-04	34	5.9E-06		9.9E-05	2.9E-06	9.9E-05	2.9E-06
Dibenzofuran	132-64-9	1.1E-03	30,000	3.7E-08		5.5E-04	1.8E-08	5.5E-04	1.8E-08
Dibromochloromethane	124-48-1	1.8E-03	7,400	2.4E-07		8.9E-04	1.2E-07	8.9E-04	1.2E-07
Dichlorobenzene, 1,2-	95-50-1	1.1E-03	300,000	3.8E-09		5.6E-04	1.9E-09	5.6E-04	1.9E-09
Dichlorobenzene, 1,3-	541-73-1	1.3E-03	16,000	7.9E-08		6.3E-04	3.9E-08	6.3E-04	3.9E-08

Source M-136 A and M-225-A, Acute HQs and HI Boundary 3, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	1.2E-03	60,000	2.0E-08		5.9E-04	9.8E-09	5.9E-04	9.8E-09
Dichloroethane 1,1-	75-34-3	6.5E-04	650,000	1.0E-09		3.2E-04	5.0E-10	3.2E-04	5.0E-10
Dichloroethane, 1,2	107-06-2	1.1E-03	200,000	5.5E-09		5.4E-04	2.7E-09	5.4E-04	2.7E-09
Dichloroethylene 1,1-	75-35-4	8.7E-04	180,000	4.8E-09		4.3E-04	2.4E-09	4.3E-04	2.4E-09
Dichloroethylene, cis-1,2-	156-59-2	2.4E-04	560,000	4.3E-10		1.2E-04	2.2E-10	1.2E-04	2.2E-10
Dichloroethylene-1,2 (trans)	156-60-5	1.5E-03	1,100,000	1.3E-09		7.3E-04	6.6E-10	7.3E-04	6.6E-10
Dichlorophenol, 2,4-	120-83-2	1.9E-03	1,300	1.4E-06		9.3E-04	7.2E-07	9.3E-04	7.2E-07
Dichloropropane, 1,2-	78-87-5	7.5E-04	140,000	5.3E-09		3.7E-04	2.7E-09	3.7E-04	2.7E-09
Diethyl phthalate	84-66-2	1.6E-03	5,000	3.2E-07		8.1E-04	1.6E-07	8.1E-04	1.6E-07
Dimethyl phthalate	131-11-3	1.1E-03	15,000	7.4E-08		5.5E-04	3.7E-08	5.5E-04	3.7E-08
Dimethylphenol, 2,4-	105-67-9	1.4E-02	4,500	3.1E-06		7.0E-03	1.5E-06	7.0E-03	1.5E-06
Di-n-butyl phthalate	84-74-2	2.2E-02	15,000	1.5E-06		1.1E-02	7.4E-07	1.1E-02	7.4E-07
Dinitrobenzene, 1,3-	99-65-0	1.2E-03	1,000	1.2E-06		5.8E-04	5.8E-07	5.8E-04	5.8E-07
Dinitrophenol, 2,4-	51-28-5	4.9E-02	220	2.2E-04		2.4E-02	1.1E-04	2.4E-02	1.1E-04
Dinitrotoluene, 2,4-	121-14-2	1.1E-03	600	1.8E-06		5.5E-04	9.2E-07	5.5E-04	9.2E-07
Dinitrotoluene, 2,6-	606-20-2	1.1E-03	600	1.9E-06		5.7E-04	9.5E-07	5.7E-04	9.5E-07
Di-n-octylphthalate	117-84-0	7.4E-03	6,800	1.1E-06		3.7E-03	5.5E-07	3.7E-03	5.5E-07
Dioxane, 1,4-	123-91-1	1.3E-03	3,000	4.3E-07		6.5E-04	2.2E-07	6.5E-04	2.2E-07
Diphenylamine	122-39-4	1.1E-03	30,000	3.7E-08		5.5E-04	1.8E-08	5.5E-04	1.8E-08
Ethyl methacrylate	97-63-2	3.2E-03	13,000	2.5E-07		1.6E-03	1.2E-07	1.6E-03	1.2E-07
Ethylbenzene	100-41-4	2.2E-02	140,000	1.6E-07		1.1E-02	7.9E-08	1.1E-02	7.9E-08
Ethylene Dibromide	106-93-4	1.8E-03	130,000	1.4E-08		9.0E-04	6.9E-09	9.0E-04	6.9E-09
Ethylether	60-29-7	5.1E-03	1,500,000	3.4E-09		2.5E-03	1.7E-09	2.5E-03	1.7E-09
Ethylhexyl phthalate, bis-2-	117-81-7	2.3E-03	10,000	2.3E-07		1.1E-03	1.1E-07	1.1E-03	1.1E-07
Fluoranthene	206-44-0	5.3E-03	1,500	3.5E-06		2.7E-03	1.8E-06	2.7E-03	1.8E-06
Fluorene	86-73-7	1.3E-03	6,600	2.0E-07		6.6E-04	1.0E-07	6.6E-04	1.0E-07
Formaldehyde	50-00-0	9.5E-02	55	1.7E-03		4.7E-02	8.6E-04	4.7E-02	8.6E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	5.6E-08	3	1.9E-08		2.8E-08	9.4E-09	2.8E-08	9.4E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.4E-06	45	3.2E-08		7.1E-07	1.6E-08	7.1E-07	1.6E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	3.7E-07	60	6.2E-09		1.9E-07	3.1E-09	1.9E-07	3.1E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	6.8E-09	0.074	9.2E-08		3.4E-09	4.6E-08	3.4E-09	4.6E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.7E-08	0.75	2.3E-08		8.7E-09	1.2E-08	8.7E-09	1.2E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	1.2E-08	3.9	3.0E-09		5.9E-09	1.5E-09	5.9E-09	1.5E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	5.1E-07	0.074	6.9E-06		2.5E-07	3.4E-06	2.5E-07	3.4E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	3.1E-07	0.037	8.4E-06		1.6E-07	4.2E-06	1.6E-07	4.2E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	2.3E-07	30	7.8E-09		1.2E-07	3.9E-09	1.2E-07	3.9E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	3.7E-07	0.49	7.6E-07		1.9E-07	3.8E-07	1.9E-07	3.8E-07
Hexachloro-1,3-butadiene	87-68-3	1.6E-03	11,000	1.5E-07		8.2E-04	7.4E-08	8.2E-04	7.4E-08
Hexachlorobenzene	118-74-1	9.4E-03	6	1.6E-03		4.7E-03	7.8E-04	4.7E-03	7.8E-04
Hexachlorocyclopentadiene	77-47-4	2.2E-02	110	2.0E-04		1.1E-02	1.0E-04	1.1E-02	1.0E-04
Hexachloroethane (Perchloroethane)	67-72-1	1.2E-03	29,000	4.1E-08		6.0E-04	2.1E-08	6.0E-04	2.1E-08
Hexachloropropene	1888-71-7	1.6E-03	905	1.8E-06		8.0E-04	8.8E-07	8.0E-04	8.8E-07
Hexane	110-54-3	2.0E-02	1,100,000	1.8E-08		9.9E-03	9.0E-09	9.9E-03	9.0E-09
Hydrogen chloride	7647-01-0	3.6E+01	2,100	1.7E-02		1.8E+01	8.6E-03	1.8E+01	8.6E-03
Indeno(1,2,3-cd) pyrene	193-39-5	7.6E-04	15	5.1E-05		3.8E-04	2.5E-05	3.8E-04	2.5E-05
Isophorone	78-59-1	1.1E-03	23,000	4.8E-08		5.5E-04	2.4E-08	5.5E-04	2.4E-08
Lead	7439-92-1	7.9E-02	150	5.2E-04		3.9E-02	2.6E-04	3.9E-02	2.6E-04
Manganese	7439-96-5	1.8E-01	3,000	6.0E-05		9.0E-02	3.0E-05	9.0E-02	3.0E-05
Mercuric chloride	7487-94-7	1.0E-05	2,700	3.8E-09		5.2E-06	1.9E-09	5.2E-06	1.9E-09
Methacrylonitrile	126-98-7	1.2E-02	2,700	4.4E-06		6.0E-03	2.2E-06	6.0E-03	2.2E-06
Methyl bromide	74-83-9	2.4E-04	3,900	6.2E-08		1.2E-04	3.1E-08	1.2E-04	3.1E-08
Methyl chloride	74-87-3	2.8E-02	210,000	1.3E-07		1.4E-02	6.7E-08	1.4E-02	6.7E-08
Methyl ethyl ketone	78-93-3	7.9E-03	13,000	6.1E-07		3.9E-03	3.0E-07	3.9E-03	3.0E-07
Methyl isobutyl ketone	108-10-1	1.7E-03	310,000	5.3E-09		8.3E-04	2.7E-09	8.3E-04	2.7E-09
Methyl tert-butyl ether	1634-04-4	2.6E-02	180,000	1.5E-07		1.3E-02	7.3E-08	1.3E-02	7.3E-08
Methylcyclohexane	108-87-2	2.4E-02	1,600,000	1.5E-08		1.2E-02	7.6E-09	1.2E-02	7.6E-09
Methylene chloride	75-09-2	4.9E-01	14,000	3.5E-05		2.4E-01	1.7E-05	2.4E-01	1.7E-05
Methylmethacrylate	80-62-6	3.2E-03	70,000	4.6E-08		1.6E-03	2.3E-08	1.6E-03	2.3E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	1.9E-01	79,000	2.3E-06		9.2E-02	1.2E-06	9.2E-02	1.2E-06
Nickel	7440-02-0	1.1E-01	0.2	5.6E-01		5.5E-02	2.8E-01	9.6E-04	4.8E-03
Nitroaniline, 2-	88-74-4	1.1E-03	4,800	2.3E-07		5.5E-04	1.2E-07	5.5E-04	1.2E-07
Nitroaniline, 3-	99-09-2	4.4E-03	110	4.0E-05		2.2E-03	2.0E-05	2.2E-03	2.0E-05
Nitroaniline, 4-	100-01-6	4.4E-03	9,000	4.9E-07		2.2E-03	2.5E-07	2.2E-03	2.5E-07
Nitrobenzene	98-95-3	1.3E-03	9,100	1.4E-07		6.3E-04	6.9E-08	6.3E-04	6.9E-08
Nitrophenol, 2-	88-75-5	9.5E-03	1,000	9.5E-06		4.8E-03	4.8E-06	4.8E-03	4.8E-06
Nitrophenol, 4-	100-02-7	7.3E-03	1,200	6.1E-06		3.6E-03	3.0E-06	3.6E-03	3.0E-06
Nitroso-di-n-butylamine, n-	924-16-3	1.1E-03	2,000	5.5E-07		5.5E-04	2.8E-07	5.5E-04	2.8E-07
Nitrosodiphenylamine, N-	86-30-6	2.0E-04	1,400	1.4E-07		9.8E-05	7.0E-08	9.8E-05	7.0E-08
Nitrosodipropylamine, n-	621-64-7	1.1E-03	2,000	5.5E-07		5.5E-04	2.8E-07	5.5E-04	2.8E-07
n-Nitrosodiethylamine	55-18-5	1.1E-03	1,700	6.5E-07		5.5E-04	3.3E-07	5.5E-04	3.3E-07
n-Nitrosodimethylamine	62-75-9	1.1E-03	1,700	6.6E-07		5.6E-04	3.3E-07	5.6E-04	3.3E-07
n-Nitrosomethylethylamine	10595-95-6	1.8E-03	1,700	1.1E-06		9.2E-04	5.4E-07	9.2E-04	5.4E-07
n-Nitrosomorpholine	59-89-2	1.1E-03	74	1.5E-05		5.5E-04	7.5E-06	5.5E-04	7.5E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	7.2E-08	3	2.4E-08		3.6E-08	1.2E-08	3.6E-08	1.2E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.0E-06	75	1.4E-08		5.2E-07	6.9E-09	5.2E-07	6.9E-09
o-Tolualdehyde	529-20-4	8.1E-02	17,000	4.8E-06		4.0E-02	2.4E-06	4.0E-02	2.4E-06
p-Dimethylaminoazobenzene	60-11-7	1.1E-03	670	1.6E-06		5.3E-04	8.0E-07	5.3E-04	8.0E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	1.3E-08	0.1	1.3E-07		6.5E-09	6.5E-08	6.5E-09	6.5E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	1.6E-07	0.24	6.6E-07		7.9E-08	3.3E-07	7.9E-08	3.3E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	3.1E-07	0.074	4.2E-06		1.6E-07	2.1E-06	1.6E-07	2.1E-06
Pentachlorobenzene	608-93-5	1.1E-03	1,600	6.9E-07		5.5E-04	3.5E-07	5.5E-04	3.5E-07
Pentachloroethane	76-01-7	1.4E-03	320,000	4.4E-09		7.0E-04	2.2E-09	7.0E-04	2.2E-09
Pentachloronitrobenzene	82-68-8	1.2E-03	1,500	7.8E-07		5.9E-04	3.9E-07	5.9E-04	3.9E-07
Pentachlorophenol	87-86-5	5.5E-02	1,400	4.0E-05		2.8E-02	2.0E-05	2.8E-02	2.0E-05
Perchlorate	14797-73-0	9.5E-04	23	4.1E-05		4.8E-04	2.1E-05	4.8E-04	2.1E-05
Phenanthrene	85-01-8	6.4E-03	760	8.4E-06		3.2E-03	4.2E-06	3.2E-03	4.2E-06
Phenol	108-95-2	6.0E-03	5,800	1.0E-06		3.0E-03	5.2E-07	3.0E-03	5.2E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	2.1E-01	270	7.8E-04		1.1E-01	3.9E-04	1.1E-01	3.9E-04
Propanal	123-38-6	1.1E-01	110,000	9.6E-07		5.2E-02	4.8E-07	5.2E-02	4.8E-07
Propylbenzene	103-65-1	9.3E-03	5,400	1.7E-06		4.6E-03	8.6E-07	4.6E-03	8.6E-07
Propylene	115-07-1	9.9E-02	860,000	1.2E-07		4.9E-02	5.8E-08	4.9E-02	5.8E-08
Pyrene	129-00-0	4.5E-03	150	3.0E-05		2.3E-03	1.5E-05	2.3E-03	1.5E-05
Pyridine	110-86-1	1.6E-03	9,700	1.7E-07		8.2E-04	8.4E-08	8.2E-04	8.4E-08
Selenium	7782-49-2	3.1E-03	200	1.5E-05		1.5E-03	7.6E-06	1.5E-03	7.6E-06
Silver	7440-22-4	2.3E-03	100	2.3E-05		1.1E-03	1.1E-05	1.1E-03	1.1E-05
Styrene	100-42-5	2.6E-03	21,000	1.3E-07		1.3E-03	6.2E-08	1.3E-03	6.2E-08
TetraCDD, 2,3,7,8-	1746-01-6	4.6E-09	0.00003	1.5E-04		2.3E-09	7.6E-05	2.3E-09	7.6E-05
TetraCDF, 2,3,7,8-	51207-31-9	8.0E-08	0.074	1.1E-06		4.0E-08	5.4E-07	4.0E-08	5.4E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.1E-03	240	4.6E-06		5.5E-04	2.3E-06	5.5E-04	2.3E-06
Tetrachloroethane, 1,1,2,2-	79-34-5	8.5E-04	7,000	1.2E-07		4.2E-04	6.1E-08	4.2E-04	6.1E-08
Tetrachloroethylene	127-18-4	5.1E-03	20,000	2.5E-07		2.5E-03	1.3E-07	2.5E-03	1.3E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.4E-03	1,300	1.1E-06		7.2E-04	5.5E-07	7.2E-04	5.5E-07
Tetrahydrofuran	109-99-9	1.8E-03	290,000	6.3E-09		9.1E-04	3.1E-09	9.1E-04	3.1E-09
Toluene	108-88-3	5.7E-02	37,000	1.5E-06		2.8E-02	7.6E-07	2.8E-02	7.6E-07
Toluidine, o-	95-53-4	1.4E-02	8,800	1.6E-06		7.1E-03	8.0E-07	7.1E-03	8.0E-07
Trans-1,3-dichloropropene	10061-02-6	1.2E-03	75,000	1.6E-08		6.2E-04	8.2E-09	6.2E-04	8.2E-09
trans-2-Butene	624-64-6	1.6E-02	1,000,000	1.6E-08		7.8E-03	7.8E-09	7.8E-03	7.8E-09
Trichlorobenzene, 1,2,4-	120-82-1	1.3E-03	3,400	3.8E-07		6.5E-04	1.9E-07	6.5E-04	1.9E-07
Trichloroethane, 1,1,1-	71-55-6	5.5E-04	1,300,000	4.2E-10		2.7E-04	2.1E-10	2.7E-04	2.1E-10
Trichloroethane, 1,1,2-	79-00-5	1.5E-03	81,000	1.8E-08		7.4E-04	9.1E-09	7.4E-04	9.1E-09
Trichloroethylene	79-01-6	1.9E-03	700,000	2.7E-09		9.5E-04	1.4E-09	9.5E-04	1.4E-09
Trichlorophenol, 2,4,5-	95-95-4	2.9E-03	7,400	3.9E-07		1.4E-03	1.9E-07	1.4E-03	1.9E-07
Trichlorophenol, 2,4,6-	88-06-2	2.6E-03	1,800	1.5E-06		1.3E-03	7.3E-07	1.3E-03	7.3E-07
Trimethylbenzene, 1,3,5-	108-67-8	3.8E-02	690,000	5.6E-08		1.9E-02	2.8E-08	1.9E-02	2.8E-08
Trinitrobenzene, 1,3,5	99-35-4	1.1E-03	530	2.1E-06		5.5E-04	1.0E-06	5.5E-04	1.0E-06
Undecane	1120-21-4	2.4E-02	1,500	1.6E-05		1.2E-02	8.1E-06	1.2E-02	8.1E-06

Source M-136 A and M-225-A, Acute HQs and HI Boundary 3, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	1.5E-02	180,000	8.5E-08		7.7E-03	4.3E-08	7.7E-03	4.3E-08
Xylene, m-	108-38-3	2.2E-02	22,000	1.0E-06		1.1E-02	5.0E-07	1.1E-02	5.0E-07
Xylene, o-	95-47-6	2.6E-02	22,000	1.2E-06		1.3E-02	6.0E-07	1.3E-02	6.0E-07
Xylene, p-	106-42-3	2.2E-02	22,000	1.0E-06		1.1E-02	5.0E-07	1.1E-02	5.0E-07
Zinc	7440-66-6	1.1E-01	1,900	5.6E-05		5.4E-02	2.8E-05	5.4E-02	2.8E-05
			Total	**0.7**		**Total**	**0.4**	**With adjusted Ni & Cr**	**0.1**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	9.2E-04	690,000	1.3E-09		4.6E-04	6.7E-10	4.6E-04	6.7E-10
1,2,4-Trimethylbenzene	95-63-6	5.5E-02	690,000	8.0E-08		2.7E-02	4.0E-08	2.7E-02	4.0E-08
1,4-Diethylbenzene	105-05-5	1.5E-03	12,000	1.2E-07		7.4E-04	6.1E-08	7.4E-04	6.1E-08
1-Butene	106-98-9	4.8E-02	1,200,000	4.0E-08		2.4E-02	2.0E-08	2.4E-02	2.0E-08
1-Chloronapthalene	90-13-1	1.2E-03	4,600	2.6E-07		6.0E-04	1.3E-07	6.0E-04	1.3E-07
1-Naphthylamine	134-32-7	2.4E-02	210	1.2E-04		1.2E-02	5.8E-05	1.2E-02	5.8E-05
2,2,4-Trimethylpentane	540-84-1	5.3E-02	14,000,000	3.8E-09		2.6E-02	1.9E-09	2.6E-02	1.9E-09
2,2-Dimethylbutane	75-83-2	3.1E-03	1,800,000	1.7E-09		1.5E-03	8.5E-10	1.5E-03	8.5E-10
2,3,4-Trimethylpentane	565-75-3	1.8E-02	14,000,000	1.3E-09		9.0E-03	6.4E-10	9.0E-03	6.4E-10
2,3-Dimethylbutane	79-29-8	7.7E-03	1,800,000	4.3E-09		3.8E-03	2.1E-09	3.8E-03	2.1E-09
2,3-Dimethylpentane	565-59-3	3.1E-02	1,800,000	1.7E-08		1.5E-02	8.5E-09	1.5E-02	8.5E-09
2,4-Dimethylpentane	108-08-7	1.1E-02	180,000	6.4E-08		5.7E-03	3.2E-08	5.7E-03	3.2E-08
2,5-Dimethylbenzaldehyde	5779-94-2	5.9E-02	17,000	3.5E-06		3.0E-02	1.7E-06	3.0E-02	1.7E-06
2,6-Dichlorophenol	87-65-0	1.2E-03	8,800	1.4E-07		6.0E-04	6.8E-08	6.0E-04	6.8E-08
2-Ethyltoluene	611-14-3	9.9E-04	12,000	8.3E-08		4.9E-04	4.1E-08	4.9E-04	4.1E-08
2-Hexanone	591-78-6	4.4E-03	41,000	1.1E-07		2.2E-03	5.4E-08	2.2E-03	5.4E-08
2-Methylhexane	591-76-4	3.7E-02	1,800,000	2.1E-08		1.9E-02	1.0E-08	1.9E-02	1.0E-08
2-Methylnaphthalene	91-57-6	1.6E-02	3,000	5.5E-06		8.2E-03	2.7E-06	8.2E-03	2.7E-06
2-Methylpentane	107-83-5	2.4E-02	1,800,000	1.3E-08		1.2E-02	6.7E-09	1.2E-02	6.7E-09
2-Naphthylamine	91-59-8	2.4E-02	320	7.5E-05		1.2E-02	3.7E-05	1.2E-02	3.7E-05
3-Ethyltoluene	620-14-4	1.1E-02	12,000	8.8E-07		5.3E-03	4.4E-07	5.3E-03	4.4E-07
3-Methylheptane	589-81-1	7.7E-03	1,400,000	5.5E-09		3.8E-03	2.7E-09	3.8E-03	2.7E-09
3-Methylhexane	589-34-4	4.8E-02	1,800,000	2.7E-08		2.4E-02	1.3E-08	2.4E-02	1.3E-08
3-Methylpentane	96-14-0	1.6E-02	1,800,000	8.7E-09		7.8E-03	4.3E-09	7.8E-03	4.3E-09
4,6-Dinitro-2-methylphenol	534-52-1	2.1E-02	200	1.0E-04		1.0E-02	5.2E-05	1.0E-02	5.2E-05
4-Aminobyphenyl	92-67-1	2.4E-02	490	4.9E-05		1.2E-02	2.5E-05	1.2E-02	2.5E-05
4-Ethyltoluene	622-96-8	1.2E-02	12,000	9.7E-07		5.8E-03	4.9E-07	5.8E-03	4.9E-07
Acenaphthene	83-32-9	1.2E-03	3,600	3.4E-07		6.0E-04	1.7E-07	6.0E-04	1.7E-07
Acenaphthylene	208-96-8	6.8E-03	10,000	6.8E-07		3.4E-03	3.4E-07	3.4E-03	3.4E-07
Acetaldehyde	75-07-0	2.0E-01	470	4.4E-04		1.0E-01	2.2E-04	1.0E-01	2.2E-04
Acetone	67-64-1	5.3E-02	470,000	1.1E-07		2.6E-02	5.6E-08	2.6E-02	5.6E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetonitrile	75-05-8	4.2E-02	22,000	1.9E-06		2.1E-02	9.5E-07	2.1E-02	9.5E-07
Acetophenone	98-86-2	5.9E-03	10,000	5.9E-07		2.9E-03	2.9E-07	2.9E-03	2.9E-07
Acrylonitrile	107-13-1	3.5E-02	10,000	3.5E-06		1.8E-02	1.8E-06	1.8E-02	1.8E-06
Aluminum	7429-90-5	8.3E+01	3,000	2.8E-02		4.2E+01	1.4E-02	4.2E+01	1.4E-02
Aniline	62-53-3	1.8E-02	30,000	5.9E-07		8.8E-03	2.9E-07	8.8E-03	2.9E-07
Anthracene	120-12-7	2.9E-04	270	1.1E-06		1.4E-04	5.3E-07	1.4E-04	5.3E-07
Antimony	7440-36-0	6.4E-02	500	1.3E-04		3.2E-02	6.4E-05	3.2E-02	6.4E-05
Arsenic	7440-38-2	1.1E-03	0.20	5.7E-03		5.7E-04	2.9E-03	5.7E-04	2.9E-03
Barium	7440-39-3	8.1E-04	1,500	5.4E-07		4.1E-04	2.7E-07	4.1E-04	2.7E-07
Benzaldehyde	100-52-7	8.4E-02	17,000	4.9E-06		4.2E-02	2.5E-06	4.2E-02	2.5E-06
Benzene	71-43-2	2.6E-01	27	9.8E-03		1.3E-01	4.9E-03	1.3E-01	4.9E-03
Benzo(a)anthracene	56-55-3	1.3E-03	1,200	1.1E-06		6.3E-04	5.3E-07	6.3E-04	5.3E-07
Benzo(a)pyrene	50-32-8	1.6E-04	600	2.7E-07		8.2E-05	1.4E-07	8.2E-05	1.4E-07
Benzo(b)fluoranthene	205-99-2	2.5E-03	31	8.2E-05		1.3E-03	4.1E-05	1.3E-03	4.1E-05
Benzo(g,h,i)perylene	191-24-2	9.5E-04	30,000	3.2E-08		4.7E-04	1.6E-08	4.7E-04	1.6E-08
Benzo(k)fluoranthene	207-08-9	2.5E-03	19	1.3E-04		1.2E-03	6.5E-05	1.2E-03	6.5E-05
Benzoic acid	65-85-0	1.4E-01	2,800	4.9E-05		6.9E-02	2.4E-05	6.9E-02	2.4E-05
Benzyl alcohol	100-51-6	1.7E-03	130,000	1.3E-08		8.5E-04	6.6E-09	8.5E-04	6.6E-09
Benzyl chloride	100-44-7	1.3E-03	240	5.2E-06		6.3E-04	2.6E-06	6.3E-04	2.6E-06
Bis(2-chlorethyl)ether	111-44-4	1.3E-03	58,000	2.3E-08		6.7E-04	1.2E-08	6.7E-04	1.2E-08
Bis(2-chloroethoxy)methane	111-91-1	1.2E-03	920	1.3E-06		6.0E-04	6.5E-07	6.0E-04	6.5E-07
Bromodichloromethane	75-27-4	1.7E-03	260	6.6E-06		8.6E-04	3.3E-06	8.6E-04	3.3E-06
Bromoform	75-25-2	2.9E-03	15,000	1.9E-07		1.4E-03	9.5E-08	1.4E-03	9.5E-08
Bromophenyl-phenylether, 4-	101-55-3	1.2E-03	290	4.2E-06		6.0E-04	2.1E-06	6.0E-04	2.1E-06
Butylbenzylphthalate	85-68-7	3.3E-04	15,000	2.2E-08		1.6E-04	1.1E-08	1.6E-04	1.1E-08
Cadmium	7440-43-9	9.8E-05	100	9.8E-07		4.9E-05	4.9E-07	4.9E-05	4.9E-07
Carbazole	86-74-8	1.5E-03	660	2.3E-06		7.7E-04	1.2E-06	7.7E-04	1.2E-06
Carbon disulfide	75-15-0	2.2E-02	6,200	3.5E-06		1.1E-02	1.7E-06	1.1E-02	1.7E-06
Carbon tetrachloride	56-23-5	3.3E-02	1,900	1.7E-05		1.6E-02	8.7E-06	1.6E-02	8.7E-06
Chlorine	7782-50-5	2.6E+01	210	1.2E-01		1.3E+01	6.2E-02	1.3E+01	6.2E-02
Chloro-3-methylphenol, 4-	59-50-7	1.5E-03	5,500	2.7E-07		7.5E-04	1.4E-07	7.5E-04	1.4E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroacetonitrile	107-14-2	2.4E-03	9,000	2.7E-07		1.2E-03	1.3E-07	1.2E-03	1.3E-07
Chloroaniline, p-	106-47-8	3.4E-04	2,200	1.6E-07		1.7E-04	7.7E-08	1.7E-04	7.7E-08
Chlorobenzene	108-90-7	5.5E-03	46,000	1.2E-07		2.7E-03	6.0E-08	2.7E-03	6.0E-08
Chloroethane	75-00-3	9.7E-04	260,000	3.7E-09		4.8E-04	1.9E-09	4.8E-04	1.9E-09
Chloroform (Trichloromethane)	67-66-3	1.3E-02	150	9.0E-05		6.7E-03	4.5E-05	6.7E-03	4.5E-05
Chloronaphthalene,2-	91-58-7	1.2E-03	600	2.0E-06		6.0E-04	1.0E-06	6.0E-04	1.0E-06
Chlorophenol, 2-	95-57-8	4.2E-03	1,300	3.3E-06		2.1E-03	1.6E-06	2.1E-03	1.6E-06
Chromium III	7440-47-3	2.3E-02	1,500	1.5E-05		1.1E-02	7.6E-06	5.7E-04	3.8E-07
Chromium, hexavalent	18540-29-9	1.9E-02	89	2.1E-04		9.4E-03	1.1E-04	4.7E-04	5.3E-06
Chrysene	218-01-9	1.6E-03	600	2.6E-06		7.9E-04	1.3E-06	7.9E-04	1.3E-06
Cis-1,3-dichloropropene	10062-01-5	2.9E-03	600	4.8E-06		1.4E-03	2.4E-06	1.4E-03	2.4E-06
cis-2-Butene	590-18-1	3.7E-03	150,000,000	2.5E-11		1.9E-03	1.2E-11	1.9E-03	1.2E-11
Cobalt	7440-48-4	2.5E-04	180	1.4E-06		1.2E-04	6.9E-07	1.2E-04	6.9E-07
Copper	7440-50-8	5.2E-02	100	5.2E-04		2.6E-02	2.6E-04	2.6E-02	2.6E-04
Cresol, m-	108-39-4	2.8E-04	20,000	1.4E-08		1.4E-04	7.1E-09	1.4E-04	7.1E-09
Cresol, o-	95-48-7	7.2E-03	20,000	3.6E-07		3.6E-03	1.8E-07	3.6E-03	1.8E-07
Cresol, p-	106-44-5	2.8E-04	20,000	1.4E-08		1.4E-04	7.1E-09	1.4E-04	7.1E-09
Crotonaldehyde	4170-30-3	7.0E-03	540	1.3E-05		3.5E-03	6.5E-06	3.5E-03	6.5E-06
Cumene	98-82-8	9.2E-04	250,000	3.7E-09		4.6E-04	1.8E-09	4.6E-04	1.8E-09
Cyclohexane	110-82-7	5.5E-03	340,000	1.6E-08		2.7E-03	8.1E-09	2.7E-03	8.1E-09
Dibenz(a,h)anthracene	53-70-3	2.2E-04	34	6.4E-06		1.1E-04	3.2E-06	1.1E-04	3.2E-06
Dibenzofuran	132-64-9	1.2E-03	30,000	4.0E-08		6.0E-04	2.0E-08	6.0E-04	2.0E-08
Dibromochloromethane	124-48-1	1.9E-03	7,400	2.6E-07		9.7E-04	1.3E-07	9.7E-04	1.3E-07
Dichlorobenzene, 1,2-	95-50-1	1.2E-03	300,000	4.1E-09		6.1E-04	2.0E-09	6.1E-04	2.0E-09
Dichlorobenzene, 1,3-	541-73-1	1.4E-03	16,000	8.6E-08		6.9E-04	4.3E-08	6.9E-04	4.3E-08
Dichlorobenzene,1,4-	106-46-7	1.3E-03	60,000	2.1E-08		6.4E-04	1.1E-08	6.4E-04	1.1E-08
Dichloroethane 1,1-	75-34-3	7.0E-04	650,000	1.1E-09		3.5E-04	5.4E-10	3.5E-04	5.4E-10
Dichloroethane, 1,2	107-06-2	1.2E-03	200,000	5.9E-09		5.9E-04	3.0E-09	5.9E-04	3.0E-09
Dichloroethylene 1,1-	75-35-4	9.5E-04	180,000	5.3E-09		4.7E-04	2.6E-09	4.7E-04	2.6E-09
Dichloroethylene, cis-1,2-	156-59-2	2.6E-04	560,000	4.7E-10		1.3E-04	2.4E-10	1.3E-04	2.4E-10
Dichloroethylene-1,2 (trans)	156-60-5	1.6E-03	1,100,000	1.4E-09		7.9E-04	7.2E-10	7.9E-04	7.2E-10

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorophenol, 2,4-	120-83-2	2.0E-03	1,300	1.6E-06		1.0E-03	7.8E-07	1.0E-03	7.8E-07
Dichloropropane, 1,2-	78-87-5	8.1E-04	140,000	5.8E-09		4.1E-04	2.9E-09	4.1E-04	2.9E-09
Diethyl phthalate	84-66-2	1.8E-03	5,000	3.5E-07		8.8E-04	1.8E-07	8.8E-04	1.8E-07
Dimethyl phthalate	131-11-3	1.2E-03	15,000	8.0E-08		6.0E-04	4.0E-08	6.0E-04	4.0E-08
Dimethylphenol, 2,4-	105-67-9	1.5E-02	4,500	3.4E-06		7.6E-03	1.7E-06	7.6E-03	1.7E-06
Di-n-butyl phthalate	84-74-2	2.4E-02	15,000	1.6E-06		1.2E-02	8.1E-07	1.2E-02	8.1E-07
Dinitrobenzene, 1,3-	99-65-0	1.3E-03	1,000	1.3E-06		6.3E-04	6.3E-07	6.3E-04	6.3E-07
Dinitrophenol, 2,4-	51-28-5	5.3E-02	220	2.4E-04		2.6E-02	1.2E-04	2.6E-02	1.2E-04
Dinitrotoluene, 2,4-	121-14-2	1.2E-03	600	2.0E-06		6.0E-04	1.0E-06	6.0E-04	1.0E-06
Dinitrotoluene, 2,6-	606-20-2	1.2E-03	600	2.1E-06		6.2E-04	1.0E-06	6.2E-04	1.0E-06
Di-n-octylphthalate	117-84-0	8.1E-03	6,800	1.2E-06		4.0E-03	5.9E-07	4.0E-03	5.9E-07
Dioxane, 1,4-	123-91-1	1.4E-03	3,000	4.7E-07		7.0E-04	2.3E-07	7.0E-04	2.3E-07
Diphenylamine	122-39-4	1.2E-03	30,000	4.0E-08		6.0E-04	2.0E-08	6.0E-04	2.0E-08
Ethyl methacrylate	97-63-2	3.5E-03	13,000	2.7E-07		1.8E-03	1.4E-07	1.8E-03	1.4E-07
Ethylbenzene	100-41-4	2.4E-02	140,000	1.7E-07		1.2E-02	8.6E-08	1.2E-02	8.6E-08
Ethylene Dibromide	106-93-4	2.0E-03	130,000	1.5E-08		9.8E-04	7.5E-09	9.8E-04	7.5E-09
Ethylether	60-29-7	5.5E-03	1,500,000	3.7E-09		2.7E-03	1.8E-09	2.7E-03	1.8E-09
Ethylhexyl phthalate, bis-2-	117-81-7	2.5E-03	10,000	2.5E-07		1.2E-03	1.2E-07	1.2E-03	1.2E-07
Fluoranthene	206-44-0	5.8E-03	1,500	3.9E-06		2.9E-03	1.9E-06	2.9E-03	1.9E-06
Fluorene	86-73-7	1.4E-03	6,600	2.2E-07		7.2E-04	1.1E-07	7.2E-04	1.1E-07
Formaldehyde	50-00-0	1.0E-01	55	1.9E-03		5.2E-02	9.4E-04	5.2E-02	9.4E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	6.2E-08	3	2.1E-08		3.1E-08	1.0E-08	3.1E-08	1.0E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.5E-06	45	3.4E-08		7.7E-07	1.7E-08	7.7E-07	1.7E-08
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	4.0E-07	60	6.7E-09		2.0E-07	3.4E-09	2.0E-07	3.4E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	7.4E-09	0.07	1.0E-07		3.7E-09	5.0E-08	3.7E-09	5.0E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.9E-08	0.75	2.5E-08		9.4E-09	1.3E-08	9.4E-09	1.3E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	1.3E-08	4	3.3E-09		6.5E-09	1.7E-09	6.5E-09	1.7E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	5.5E-07	0.07	7.5E-06		2.8E-07	3.7E-06	2.8E-07	3.7E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	3.4E-07	0.04	9.2E-06		1.7E-07	4.6E-06	1.7E-07	4.6E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	2.6E-07	30	8.5E-09		1.3E-07	4.2E-09	1.3E-07	4.2E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	4.0E-07	0.49	8.2E-07		2.0E-07	4.1E-07	2.0E-07	4.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Hexachloro-1,3-butadiene	87-68-3	1.8E-03	11,000	1.6E-07		8.9E-04	8.1E-08	8.9E-04	8.1E-08
Hexachlorobenzene	118-74-1	1.0E-02	6	1.7E-03		5.1E-03	8.5E-04	5.1E-03	8.5E-04
Hexachlorocyclopentadiene	77-47-4	2.4E-02	110	2.2E-04		1.2E-02	1.1E-04	1.2E-02	1.1E-04
Hexachloroethane (Perchloroethane)	67-72-1	1.3E-03	29,000	4.5E-08		6.5E-04	2.2E-08	6.5E-04	2.2E-08
Hexachloropropene	1888-71-7	1.7E-03	905	1.9E-06		8.7E-04	9.6E-07	8.7E-04	9.6E-07
Hexane	110-54-3	2.2E-02	1,100,000	2.0E-08		1.1E-02	9.8E-09	1.1E-02	9.8E-09
Hydrogen chloride	7647-01-0	3.9E+01	2,100	1.9E-02		2.0E+01	9.3E-03	2.0E+01	9.3E-03
Indeno(1,2,3-cd) pyrene	193-39-5	8.3E-04	15	5.5E-05		4.1E-04	2.8E-05	4.1E-04	2.8E-05
Isophorone	78-59-1	1.2E-03	23,000	5.2E-08		6.0E-04	2.6E-08	6.0E-04	2.6E-08
Lead	7439-92-1	8.5E-02	150	5.7E-04		4.3E-02	2.8E-04	4.3E-02	2.8E-04
Manganese	7439-96-5	2.0E-01	3,000	6.5E-05		9.8E-02	3.3E-05	9.8E-02	3.3E-05
Mercuric chloride	7487-94-7	1.1E-05	2,700	4.2E-09		5.6E-06	2.1E-09	5.6E-06	2.1E-09
Methacrylonitrile	126-98-7	1.3E-02	2,700	4.8E-06		6.5E-03	2.4E-06	6.5E-03	2.4E-06
Methyl bromide	74-83-9	2.6E-04	3,900	6.8E-08		1.3E-04	3.4E-08	1.3E-04	3.4E-08
Methyl chloride	74-87-3	3.1E-02	210,000	1.5E-07		1.5E-02	7.3E-08	1.5E-02	7.3E-08
Methyl ethyl ketone	78-93-3	8.6E-03	13,000	6.6E-07		4.3E-03	3.3E-07	4.3E-03	3.3E-07
Methyl isobutyl ketone	108-10-1	1.8E-03	310,000	5.8E-09		9.0E-04	2.9E-09	9.0E-04	2.9E-09
Methyl tert-butyl ether	1634-04-4	2.9E-02	180,000	1.6E-07		1.4E-02	7.9E-08	1.4E-02	7.9E-08
Methylcyclohexane	108-87-2	2.6E-02	1,600,000	1.7E-08		1.3E-02	8.2E-09	1.3E-02	8.2E-09
Methylene chloride	75-09-2	5.3E-01	14,000	3.8E-05		2.6E-01	1.9E-05	2.6E-01	1.9E-05
Methylmethacrylate	80-62-6	3.5E-03	70,000	5.0E-08		1.8E-03	2.5E-08	1.8E-03	2.5E-08
Naphthalene	91-20-3	2.0E-01	79,000	2.6E-06		1.0E-01	1.3E-06	1.0E-01	1.3E-06
Nickel	7440-02-0	1.2E-01	0.20	6.0E-01		6.0E-02	3.0E-01	1.0E-03	5.2E-03
Nitroaniline, 2-	88-74-4	1.2E-03	4,800	2.5E-07		6.0E-04	1.3E-07	6.0E-04	1.3E-07
Nitroaniline, 3-	99-09-2	4.8E-03	110	4.4E-05		2.4E-03	2.2E-05	2.4E-03	2.2E-05
Nitroaniline, 4-	100-01-6	4.8E-03	9,000	5.4E-07		2.4E-03	2.7E-07	2.4E-03	2.7E-07
Nitrobenzene	98-95-3	1.4E-03	9,100	1.5E-07		6.9E-04	7.5E-08	6.9E-04	7.5E-08
Nitrophenol, 2-	88-75-5	1.0E-02	1,000	1.0E-05		5.2E-03	5.2E-06	5.2E-03	5.2E-06
Nitrophenol, 4-	100-02-7	7.9E-03	1,200	6.6E-06		4.0E-03	3.3E-06	4.0E-03	3.3E-06
Nitroso-di-n-butylamine, n-	924-16-3	1.2E-03	2,000	6.0E-07		6.0E-04	3.0E-07	6.0E-04	3.0E-07
Nitrosodiphenylamine, N-	86-30-6	2.1E-04	1,400	1.5E-07		1.1E-04	7.7E-08	1.1E-04	7.7E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Nitrosodipropylamine, n-	621-64-7	1.2E-03	2,000	6.0E-07		6.0E-04	3.0E-07	6.0E-04	3.0E-07
n-Nitrosodiethylamine	55-18-5	1.2E-03	1,700	7.1E-07		6.0E-04	3.5E-07	6.0E-04	3.5E-07
n-Nitrosodimethylamine	62-75-9	1.2E-03	1,700	7.2E-07		6.1E-04	3.6E-07	6.1E-04	3.6E-07
n-Nitrosomethylethylamine	10595-95-6	2.0E-03	1,700	1.2E-06		1.0E-03	5.9E-07	1.0E-03	5.9E-07
n-Nitrosomorpholine	59-89-2	1.2E-03	74	1.6E-05		6.0E-04	8.1E-06	6.0E-04	8.1E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	7.8E-08	3	2.6E-08		3.9E-08	1.3E-08	3.9E-08	1.3E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.1E-06	75	1.5E-08		5.6E-07	7.5E-09	5.6E-07	7.5E-09
o-Tolualdehyde	529-20-4	8.8E-02	17,000	5.2E-06		4.4E-02	2.6E-06	4.4E-02	2.6E-06
p-Dimethylaminoazobenzene	60-11-7	1.2E-03	670	1.7E-06		5.8E-04	8.7E-07	5.8E-04	8.7E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	1.4E-08	0.10	1.4E-07		7.1E-09	7.1E-08	7.1E-09	7.1E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	1.7E-07	0.24	7.1E-07		8.6E-08	3.6E-07	8.6E-08	3.6E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	3.4E-07	0.07	4.6E-06		1.7E-07	2.3E-06	1.7E-07	2.3E-06
Pentachlorobenzene	608-93-5	1.2E-03	1,600	7.5E-07		6.0E-04	3.8E-07	6.0E-04	3.8E-07
Pentachloroethane	76-01-7	1.5E-03	320,000	4.8E-09		7.7E-04	2.4E-09	7.7E-04	2.4E-09
Pentachloronitrobenzene	82-68-8	1.3E-03	1,500	8.5E-07		6.4E-04	4.3E-07	6.4E-04	4.3E-07
Pentachlorophenol	87-86-5	6.0E-02	1,400	4.3E-05		3.0E-02	2.1E-05	3.0E-02	2.1E-05
Perchlorate	14797-73-0	1.0E-03	23	4.5E-05		5.2E-04	2.3E-05	5.2E-04	2.3E-05
Phenanthrene	85-01-8	7.0E-03	760	9.2E-06		3.5E-03	4.6E-06	3.5E-03	4.6E-06
Phenol	108-95-2	6.6E-03	5,800	1.1E-06		3.3E-03	5.6E-07	3.3E-03	5.6E-07
Phosphorous	7723-14-0	2.3E-01	270	8.5E-04		1.1E-01	4.2E-04	1.1E-01	4.2E-04
Propanal	123-38-6	1.1E-01	110,000	1.0E-06		5.7E-02	5.2E-07	5.7E-02	5.2E-07
Propylbenzene	103-65-1	1.0E-02	5,400	1.9E-06		5.1E-03	9.4E-07	5.1E-03	9.4E-07
Propylene	115-07-1	1.1E-01	860,000	1.3E-07		5.4E-02	6.3E-08	5.4E-02	6.3E-08
Pyrene	129-00-0	5.0E-03	150	3.3E-05		2.5E-03	1.6E-05	2.5E-03	1.6E-05
Pyridine	110-86-1	1.8E-03	9,700	1.8E-07		8.9E-04	9.2E-08	8.9E-04	9.2E-08
Selenium	7782-49-2	3.3E-03	200	1.7E-05		1.7E-03	8.3E-06	1.7E-03	8.3E-06
Silver	7440-22-4	2.5E-03	100	2.5E-05		1.2E-03	1.2E-05	1.2E-03	1.2E-05
Styrene	100-42-5	2.9E-03	21,000	1.4E-07		1.4E-03	6.8E-08	1.4E-03	6.8E-08
TetraCDD, 2,3,7,8-	1746-01-6	5.0E-09	0.00003	1.7E-04		2.5E-09	8.3E-05	2.5E-09	8.3E-05
TetraCDF, 2,3,7,8-	51207-31-9	8.7E-08	0.07	1.2E-06		4.4E-08	5.9E-07	4.4E-08	5.9E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.2E-03	240	5.0E-06		6.0E-04	2.5E-06	6.0E-04	2.5E-06

Source M-136 A and M-225 A, Acute HQs and HI Boundary 4, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Tetrachloroethane, 1,1,2,2-	79-34-5	9.2E-04	7,000	1.3E-07		4.6E-04	6.6E-08	4.6E-04	6.6E-08
Tetrachloroethylene	127-18-4	5.5E-03	20,000	2.8E-07		2.7E-03	1.4E-07	2.7E-03	1.4E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.6E-03	1,300	1.2E-06		7.8E-04	6.0E-07	7.8E-04	6.0E-07
Tetrahydrofuran	109-99-9	2.0E-03	290,000	6.8E-09		9.9E-04	3.4E-09	9.9E-04	3.4E-09
Toluene	108-88-3	6.2E-02	37,000	1.7E-06		3.1E-02	8.3E-07	3.1E-02	8.3E-07
Toluidine, o-	95-53-4	1.5E-02	8,800	1.8E-06		7.7E-03	8.8E-07	7.7E-03	8.8E-07
Trans-1,3-dichloropropene	10061-02-6	1.3E-03	75,000	1.8E-08		6.7E-04	8.9E-09	6.7E-04	8.9E-09
trans-2-Butene	624-64-6	1.7E-02	1,000,000	1.7E-08		8.5E-03	8.5E-09	8.5E-03	8.5E-09
Trichlorobenzene, 1,2,4-	120-82-1	1.4E-03	3,400	4.2E-07		7.1E-04	2.1E-07	7.1E-04	2.1E-07
Trichloroethane, 1,1,1-	71-55-6	5.9E-04	1,300,000	4.6E-10		3.0E-04	2.3E-10	3.0E-04	2.3E-10
Trichloroethane, 1,1,2-	79-00-5	1.6E-03	81,000	2.0E-08		8.0E-04	9.9E-09	8.0E-04	9.9E-09
Trichloroethylene	79-01-6	2.1E-03	700,000	3.0E-09		1.0E-03	1.5E-09	1.0E-03	1.5E-09
Trichlorophenol, 2,4,5-	95-95-4	3.1E-03	7,400	4.2E-07		1.6E-03	2.1E-07	1.6E-03	2.1E-07
Trichlorophenol, 2,4,6-	88-06-2	2.9E-03	1,800	1.6E-06		1.4E-03	8.0E-07	1.4E-03	8.0E-07
Trimethylbenzene, 1,3,5-	108-67-8	4.2E-02	690,000	6.1E-08		2.1E-02	3.0E-08	2.1E-02	3.0E-08
Trinitrobenzene, 1,3,5	99-35-4	1.2E-03	530	2.3E-06		6.0E-04	1.1E-06	6.0E-04	1.1E-06
Undecane	1120-21-4	2.6E-02	1,500	1.8E-05		1.3E-02	8.8E-06	1.3E-02	8.8E-06
Vinyl Chloride	75-01-4	1.7E-02	180,000	9.3E-08		8.3E-03	4.6E-08	8.3E-03	4.6E-08
Xylene, m-	108-38-3	2.4E-02	22,000	1.1E-06		1.2E-02	5.5E-07	1.2E-02	5.5E-07
Xylene, o-	95-47-6	2.9E-02	22,000	1.3E-06		1.4E-02	6.5E-07	1.4E-02	6.5E-07
Xylene, p-	106-42-3	2.4E-02	22,000	1.1E-06		1.2E-02	5.5E-07	1.2E-02	5.5E-07
Zinc	7440-66-6	1.2E-01	1,900	6.1E-05		5.8E-02	3.1E-05	5.8E-02	3.1E-05
			Total	**0.8**		**Total**	**0.4**	**With adjusted Ni & Cr**	**0.1**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225, Acute HQs and Hi, Christensen Ranch, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	1.0E-03	690,000	1.5E-09		5.0E-04	7.3E-10	5.0E-04	7.3E-10
1,2,4-Trimethylbenzene	95-63-6	6.0E-02	690,000	8.7E-08		3.0E-02	4.3E-08	3.0E-02	4.3E-08
1,4-Diethylbenzene	105-05-5	1.6E-03	12,000	1.3E-07		8.0E-04	6.7E-08	8.0E-04	6.7E-08
1-Butene	106-98-9	5.3E-02	1,200,000	4.4E-08		2.6E-02	2.2E-08	2.6E-02	2.2E-08
1-Chloronapthalene	90-13-1	1.3E-03	4,600	2.9E-07		6.6E-04	1.4E-07	6.6E-04	1.4E-07
1-Naphthylamine	134-32-7	2.6E-02	210	1.3E-04		1.3E-02	6.3E-05	1.3E-02	6.3E-05
2,2,4-Trimethylpentane	540-84-1	5.8E-02	14,000,000	4.1E-09		2.9E-02	2.1E-09	2.9E-02	2.1E-09
2,2-Dimethylbutane	75-83-2	3.4E-03	1,800,000	1.9E-09		1.7E-03	9.3E-10	1.7E-03	9.3E-10
2,3,4-Trimethylpentane	565-75-3	2.0E-02	14,000,000	1.4E-09		9.8E-03	7.0E-10	9.8E-03	7.0E-10
2,3-Dimethylbutane	79-29-8	8.4E-03	1,800,000	4.7E-09		4.2E-03	2.3E-09	4.2E-03	2.3E-09
2,3-Dimethylpentane	565-59-3	3.4E-02	1,800,000	1.9E-08		1.7E-02	9.3E-09	1.7E-02	9.3E-09
2,4-Dimethylpentane	108-08-7	1.2E-02	180,000	6.9E-08		6.2E-03	3.5E-08	6.2E-03	3.5E-08
2,5-Dimethylbenzaldehyde	5779-94-2	6.5E-02	17,000	3.8E-06		3.2E-02	1.9E-06	3.2E-02	1.9E-06
2,6-Dichlorophenol	87-65-0	1.3E-03	8,800	1.5E-07		6.6E-04	7.5E-08	6.6E-04	7.5E-08
2-Ethyltoluene	611-14-3	1.1E-03	12,000	9.0E-08		5.4E-04	4.5E-08	5.4E-04	4.5E-08
2-Hexanone	591-78-6	4.8E-03	41,000	1.2E-07		2.4E-03	5.8E-08	2.4E-03	5.8E-08
2-Methylhexane	591-76-4	4.1E-02	1,800,000	2.3E-08		2.0E-02	1.1E-08	2.0E-02	1.1E-08
2-Methylnaphthalene	91-57-6	1.8E-02	3,000	6.0E-06		8.9E-03	3.0E-06	8.9E-03	3.0E-06
2-Methylpentane	107-83-5	2.6E-02	1,800,000	1.5E-08		1.3E-02	7.3E-09	1.3E-02	7.3E-09
2-Naphthylamine	91-59-8	2.6E-02	320	8.2E-05		1.3E-02	4.1E-05	1.3E-02	4.1E-05
3-Ethyltoluene	620-14-4	1.2E-02	12,000	9.6E-07		5.8E-03	4.8E-07	5.8E-03	4.8E-07
3-Methylheptane	589-81-1	8.4E-03	1,400,000	6.0E-09		4.2E-03	3.0E-09	4.2E-03	3.0E-09
3-Methylhexane	589-34-4	5.3E-02	1,800,000	2.9E-08		2.6E-02	1.5E-08	2.6E-02	1.5E-08
3-Methylpentane	96-14-0	1.7E-02	1,800,000	9.5E-09		8.5E-03	4.7E-09	8.5E-03	4.7E-09
4,6-Dinitro-2-methylphenol	534-52-1	2.3E-02	200	1.1E-04		1.1E-02	5.7E-05	1.1E-02	5.7E-05
4-Aminobyphenyl	92-67-1	2.6E-02	490	5.4E-05		1.3E-02	2.7E-05	1.3E-02	2.7E-05
4-Ethyltoluene	622-96-8	1.3E-02	12,000	1.1E-06		6.3E-03	5.3E-07	6.3E-03	5.3E-07
Acenaphthene	83-32-9	1.3E-03	3,600	3.7E-07		6.6E-04	1.8E-07	6.6E-04	1.8E-07
Acenaphthylene	208-96-8	7.4E-03	10,000	7.4E-07		3.7E-03	3.7E-07	3.7E-03	3.7E-07
Acetaldehyde	75-07-0	2.2E-01	470	4.8E-04		1.1E-01	2.4E-04	1.1E-01	2.4E-04
Acetone	67-64-1	5.8E-02	470,000	1.2E-07		2.9E-02	6.1E-08	2.9E-02	6.1E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetonitrile	75-05-8	4.6E-02	22,000	2.1E-06		2.3E-02	1.0E-06	2.3E-02	1.0E-06
Acetophenone	98-86-2	6.4E-03	10,000	6.4E-07		3.2E-03	3.2E-07	3.2E-03	3.2E-07
Acrylonitrile	107-13-1	3.8E-02	10,000	3.8E-06		1.9E-02	1.9E-06	1.9E-02	1.9E-06
Aluminum	7429-90-5	9.1E+01	3,000	3.0E-02		4.6E+01	1.5E-02	4.6E+01	1.5E-02
Aniline	62-53-3	1.9E-02	30,000	6.4E-07		9.6E-03	3.2E-07	9.6E-03	3.2E-07
Anthracene	120-12-7	3.1E-04	270	1.2E-06		1.6E-04	5.8E-07	1.6E-04	5.8E-07
Antimony	7440-36-0	7.0E-02	500	1.4E-04		3.5E-02	6.9E-05	3.5E-02	6.9E-05
Arsenic	7440-38-2	1.3E-03	0.2	6.3E-03		6.3E-04	3.1E-03	6.3E-04	3.1E-03
Barium	7440-39-3	8.9E-04	1,500	5.9E-07		4.5E-04	3.0E-07	4.5E-04	3.0E-07
Benzaldehyde	100-52-7	9.1E-02	17,000	5.4E-06		4.6E-02	2.7E-06	4.6E-02	2.7E-06
Benzene	71-43-2	2.9E-01	27	1.1E-02		1.4E-01	5.3E-03	1.4E-01	5.3E-03
Benzo(a)anthracene	56-55-3	1.4E-03	1,200	1.2E-06		6.9E-04	5.8E-07	6.9E-04	5.8E-07
Benzo(a)pyrene	50-32-8	1.8E-04	600	3.0E-07		9.0E-05	1.5E-07	9.0E-05	1.5E-07
Benzo(b)fluoranthene	205-99-2	2.8E-03	31	8.9E-05		1.4E-03	4.4E-05	1.4E-03	4.4E-05
Benzo(g,h,i)perylene	191-24-2	1.0E-03	30,000	3.5E-08		5.2E-04	1.7E-08	5.2E-04	1.7E-08
Benzo(k)fluoranthene	207-08-9	2.7E-03	19	1.4E-04		1.3E-03	7.1E-05	1.3E-03	7.1E-05
Benzoic acid	65-85-0	1.5E-01	2,800	5.4E-05		7.5E-02	2.7E-05	7.5E-02	2.7E-05
Benzyl alcohol	100-51-6	1.9E-03	130,000	1.4E-08		9.3E-04	7.2E-09	9.3E-04	7.2E-09
Benzyl chloride	100-44-7	1.4E-03	240	5.7E-06		6.8E-04	2.8E-06	6.8E-04	2.8E-06
Bis(2-chlorethyl)ether	111-44-4	1.5E-03	58,000	2.5E-08		7.3E-04	1.3E-08	7.3E-04	1.3E-08
Bis(2-chloroethoxy)methane	111-91-1	1.3E-03	920	1.4E-06		6.6E-04	7.1E-07	6.6E-04	7.1E-07
Bromodichloromethane	75-27-4	1.9E-03	260	7.2E-06		9.3E-04	3.6E-06	9.3E-04	3.6E-06
Bromoform	75-25-2	3.1E-03	15,000	2.1E-07		1.6E-03	1.0E-07	1.6E-03	1.0E-07
Bromophenyl-phenylether, 4-	101-55-3	1.3E-03	290	4.5E-06		6.6E-04	2.3E-06	6.6E-04	2.3E-06
Butylbenzylphthalate	85-68-7	3.6E-04	15,000	2.4E-08		1.8E-04	1.2E-08	1.8E-04	1.2E-08
Cadmium	7440-43-9	1.1E-04	100	1.1E-06		5.4E-05	5.4E-07	5.4E-05	5.4E-07
Carbazole	86-74-8	1.7E-03	660	2.5E-06		8.4E-04	1.3E-06	8.4E-04	1.3E-06
Carbon disulfide	75-15-0	2.4E-02	6,200	3.8E-06		1.2E-02	1.9E-06	1.2E-02	1.9E-06
Carbon tetrachloride	56-23-5	3.6E-02	1,900	1.9E-05		1.8E-02	9.5E-06	1.8E-02	9.5E-06
Chlorine	7782-50-5	2.8E+01	210	1.3E-01		1.4E+01	6.7E-02	1.4E+01	6.7E-02
Chloro-3-methylphenol, 4-	59-50-7	1.6E-03	5,500	3.0E-07		8.1E-04	1.5E-07	8.1E-04	1.5E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Chloroacetonitrile	107-14-2	2.6E-03	9,000	2.9E-07		1.3E-03	1.5E-07	1.3E-03	1.5E-07
Chloroaniline, p-	106-47-8	3.7E-04	2,200	1.7E-07		1.9E-04	8.4E-08	1.9E-04	8.4E-08
Chlorobenzene	108-90-7	6.0E-03	46,000	1.3E-07		3.0E-03	6.5E-08	3.0E-03	6.5E-08
Chloroethane	75-00-3	1.1E-03	260,000	4.1E-09		5.3E-04	2.0E-09	5.3E-04	2.0E-09
Chloroform (Trichloromethane)	67-66-3	1.5E-02	150	9.8E-05		7.3E-03	4.9E-05	7.3E-03	4.9E-05
Chloronaphthalene,2-	91-58-7	1.3E-03	600	2.2E-06		6.6E-04	1.1E-06	6.6E-04	1.1E-06
Chlorophenol, 2-	95-57-8	4.6E-03	1,300	3.5E-06		2.3E-03	1.8E-06	2.3E-03	1.8E-06
Chromium III	7440-47-3	2.5E-02	1,500	1.7E-05		1.3E-02	8.4E-06	6.3E-04	4.2E-07
Chromium, hexavalent	18540-29-9	2.1E-02	89	2.3E-04		1.0E-02	1.2E-04	5.1E-04	5.8E-06
Chrysene	218-01-9	1.7E-03	600	2.9E-06		8.6E-04	1.4E-06	8.6E-04	1.4E-06
Cis-1,3-dichloropropene	10062-01-5	3.1E-03	600	5.2E-06		1.6E-03	2.6E-06	1.6E-03	2.6E-06
cis-2-Butene	590-18-1	4.1E-03	150,000,000	2.7E-11		2.0E-03	1.4E-11	2.0E-03	1.4E-11
Cobalt	7440-48-4	2.7E-04	180	1.5E-06		1.4E-04	7.6E-07	1.4E-04	7.6E-07
Copper	7440-50-8	5.7E-02	100	5.7E-04		2.9E-02	2.9E-04	2.9E-02	2.9E-04
Cresol, m-	108-39-4	3.1E-04	20,000	1.5E-08		1.5E-04	7.7E-09	1.5E-04	7.7E-09
Cresol, o-	95-48-7	7.9E-03	20,000	3.9E-07		3.9E-03	2.0E-07	3.9E-03	2.0E-07
Cresol, p-	106-44-5	3.1E-04	20,000	1.5E-08		1.5E-04	7.7E-09	1.5E-04	7.7E-09
Crotonaldehyde	4170-30-3	7.7E-03	540	1.4E-05		3.8E-03	7.1E-06	3.8E-03	7.1E-06
Cumene	98-82-8	1.0E-03	250,000	4.0E-09		5.0E-04	2.0E-09	5.0E-04	2.0E-09
Cyclohexane	110-82-7	6.0E-03	340,000	1.8E-08		3.0E-03	8.8E-09	3.0E-03	8.8E-09
Dibenz(a,h)anthracene	53-70-3	2.4E-04	34	7.0E-06		1.2E-04	3.5E-06	1.2E-04	3.5E-06
Dibenzofuran	132-64-9	1.3E-03	30,000	4.4E-08		6.6E-04	2.2E-08	6.6E-04	2.2E-08
Dibromochloromethane	124-48-1	2.1E-03	7,400	2.9E-07		1.1E-03	1.4E-07	1.1E-03	1.4E-07
Dichlorobenzene, 1,2-	95-50-1	1.3E-03	300,000	4.5E-09		6.7E-04	2.2E-09	6.7E-04	2.2E-09
Dichlorobenzene, 1,3-	541-73-1	1.5E-03	16,000	9.4E-08		7.5E-04	4.7E-08	7.5E-04	4.7E-08
Dichlorobenzene,1,4-	106-46-7	1.4E-03	60,000	2.3E-08		7.0E-04	1.2E-08	7.0E-04	1.2E-08
Dichloroethane 1,1-	75-34-3	7.7E-04	650,000	1.2E-09		3.8E-04	5.9E-10	3.8E-04	5.9E-10
Dichloroethane, 1,2	107-06-2	1.3E-03	200,000	6.5E-09		6.5E-04	3.2E-09	6.5E-04	3.2E-09
Dichloroethylene 1,1-	75-35-4	1.0E-03	180,000	5.7E-09		5.2E-04	2.9E-09	5.2E-04	2.9E-09
Dichloroethylene, cis-1,2-	156-59-2	2.9E-04	560,000	5.1E-10		1.4E-04	2.6E-10	1.4E-04	2.6E-10
Dichloroethylene-1,2 (trans)	156-60-5	1.7E-03	1,100,000	1.6E-09		8.6E-04	7.8E-10	8.6E-04	7.8E-10

Source M-136 A and M-225, Acute HQs and Hi, Christensen Ranch, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorophenol, 2,4-	120-83-2	2.2E-03	1,300	1.7E-06		1.1E-03	8.5E-07	1.1E-03	8.5E-07
Dichloropropane, 1,2-	78-87-5	8.9E-04	140,000	6.3E-09		4.4E-04	3.2E-09	4.4E-04	3.2E-09
Diethyl phthalate	84-66-2	1.9E-03	5,000	3.8E-07		9.6E-04	1.9E-07	9.6E-04	1.9E-07
Dimethyl phthalate	131-11-3	1.3E-03	15,000	8.8E-08		6.6E-04	4.4E-08	6.6E-04	4.4E-08
Dimethylphenol, 2,4-	105-67-9	1.7E-02	4,500	3.7E-06		8.3E-03	1.8E-06	8.3E-03	1.8E-06
Di-n-butyl phthalate	84-74-2	2.6E-02	15,000	1.8E-06		1.3E-02	8.8E-07	1.3E-02	8.8E-07
Dinitrobenzene, 1,3-	99-65-0	1.4E-03	1,000	1.4E-06		6.8E-04	6.8E-07	6.8E-04	6.8E-07
Dinitrophenol, 2,4-	51-28-5	5.8E-02	220	2.6E-04		2.9E-02	1.3E-04	2.9E-02	1.3E-04
Dinitrotoluene, 2,4-	121-14-2	1.3E-03	600	2.2E-06		6.6E-04	1.1E-06	6.6E-04	1.1E-06
Dinitrotoluene, 2,6-	606-20-2	1.4E-03	600	2.3E-06		6.7E-04	1.1E-06	6.7E-04	1.1E-06
Di-n-octylphthalate	117-84-0	8.8E-03	6,800	1.3E-06		4.4E-03	6.5E-07	4.4E-03	6.5E-07
Dioxane, 1,4-	123-91-1	1.5E-03	3,000	5.1E-07		7.7E-04	2.6E-07	7.7E-04	2.6E-07
Diphenylamine	122-39-4	1.3E-03	30,000	4.4E-08		6.6E-04	2.2E-08	6.6E-04	2.2E-08
Ethyl methacrylate	97-63-2	3.8E-03	13,000	3.0E-07		1.9E-03	1.5E-07	1.9E-03	1.5E-07
Ethylbenzene	100-41-4	2.6E-02	140,000	1.9E-07		1.3E-02	9.4E-08	1.3E-02	9.4E-08
Ethylene Dibromide	106-93-4	2.1E-03	130,000	1.6E-08		1.1E-03	8.2E-09	1.1E-03	8.2E-09
Ethylether	60-29-7	6.0E-03	1,500,000	4.0E-09		3.0E-03	2.0E-09	3.0E-03	2.0E-09
Ethylhexyl phthalate, bis-2-	117-81-7	2.7E-03	10,000	2.7E-07		1.4E-03	1.4E-07	1.4E-03	1.4E-07
Fluoranthene	206-44-0	6.3E-03	1,500	4.2E-06		3.2E-03	2.1E-06	3.2E-03	2.1E-06
Fluorene	86-73-7	1.6E-03	6,600	2.4E-07		7.8E-04	1.2E-07	7.8E-04	1.2E-07
Formaldehyde	50-00-0	1.1E-01	55	2.1E-03		5.6E-02	1.0E-03	5.6E-02	1.0E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	6.8E-08	3	2.3E-08		3.4E-08	1.1E-08	3.4E-08	1.1E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.7E-06	45	3.8E-08		8.5E-07	1.9E-08	8.5E-07	1.9E-08
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	4.4E-07	60	7.4E-09		2.2E-07	3.7E-09	2.2E-07	3.7E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	8.2E-09	0.074	1.1E-07		4.1E-09	5.5E-08	4.1E-09	5.5E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	2.1E-08	0.75	2.8E-08		1.0E-08	1.4E-08	1.0E-08	1.4E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	1.4E-08	3.9	3.7E-09		7.1E-09	1.8E-09	7.1E-09	1.8E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	6.1E-07	0.074	8.2E-06		3.0E-07	4.1E-06	3.0E-07	4.1E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	3.7E-07	0.037	1.0E-05		1.9E-07	5.0E-06	1.9E-07	5.0E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	2.8E-07	30	9.4E-09		1.4E-07	4.7E-09	1.4E-07	4.7E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	4.4E-07	0.49	9.1E-07		2.2E-07	4.5E-07	2.2E-07	4.5E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Hexachloro-1,3-butadiene	87-68-3	1.9E-03	11,000	1.8E-07		9.7E-04	8.8E-08	9.7E-04	8.8E-08
Hexachlorobenzene	118-74-1	1.1E-02	6	1.9E-03		5.6E-03	9.3E-04	5.6E-03	9.3E-04
Hexachlorocyclopentadiene	77-47-4	2.6E-02	110	2.4E-04		1.3E-02	1.2E-04	1.3E-02	1.2E-04
Hexachloroethane (Perchloroethane)	67-72-1	1.4E-03	29,000	4.9E-08		7.1E-04	2.4E-08	7.1E-04	2.4E-08
Hexachloropropene	1888-71-7	1.9E-03	905	2.1E-06		9.5E-04	1.0E-06	9.5E-04	1.0E-06
Hexane	110-54-3	2.4E-02	1,100,000	2.1E-08		1.2E-02	1.1E-08	1.2E-02	1.1E-08
Hydrogen chloride	7647-01-0	4.3E+01	2,100	2.0E-02		2.1E+01	1.0E-02	2.1E+01	1.0E-02
Indeno(1,2,3-cd) pyrene	193-39-5	9.1E-04	15	6.1E-05		4.5E-04	3.0E-05	4.5E-04	3.0E-05
Isophorone	78-59-1	1.3E-03	23,000	5.7E-08		6.6E-04	2.9E-08	6.6E-04	2.9E-08
Lead	7439-92-1	9.4E-02	150	6.3E-04		4.7E-02	3.1E-04	4.7E-02	3.1E-04
Manganese	7439-96-5	2.1E-01	3,000	7.2E-05		1.1E-01	3.6E-05	1.1E-01	3.6E-05
Mercuric chloride	7487-94-7	1.2E-05	2,700	4.6E-09		6.2E-06	2.3E-09	6.2E-06	2.3E-09
Methacrylonitrile	126-98-7	1.4E-02	2,700	5.2E-06		7.1E-03	2.6E-06	7.1E-03	2.6E-06
Methyl bromide	74-83-9	2.9E-04	3,900	7.4E-08		1.4E-04	3.7E-08	1.4E-04	3.7E-08
Methyl chloride	74-87-3	3.4E-02	210,000	1.6E-07		1.7E-02	8.0E-08	1.7E-02	8.0E-08
Methyl ethyl ketone	78-93-3	9.4E-03	13,000	7.2E-07		4.7E-03	3.6E-07	4.7E-03	3.6E-07
Methyl isobutyl ketone	108-10-1	2.0E-03	310,000	6.4E-09		9.8E-04	3.2E-09	9.8E-04	3.2E-09
Methyl tert-butyl ether	1634-04-4	3.1E-02	180,000	1.7E-07		1.6E-02	8.7E-08	1.6E-02	8.7E-08
Methylcyclohexane	108-87-2	2.9E-02	1,600,000	1.8E-08		1.4E-02	9.0E-09	1.4E-02	9.0E-09
Methylene chloride	75-09-2	5.8E-01	14,000	4.1E-05		2.9E-01	2.1E-05	2.9E-01	2.1E-05
Methylmethacrylate	80-62-6	3.8E-03	70,000	5.5E-08		1.9E-03	2.7E-08	1.9E-03	2.7E-08
Naphthalene	91-20-3	2.2E-01	79,000	2.8E-06		1.1E-01	1.4E-06	1.1E-01	1.4E-06
Nickel	7440-02-0	1.3E-01	0.2	6.6E-01		6.6E-02	3.3E-01	1.1E-03	5.7E-03
Nitroaniline, 2-	88-74-4	1.3E-03	4,800	2.7E-07		6.6E-04	1.4E-07	6.6E-04	1.4E-07
Nitroaniline, 3-	99-09-2	5.3E-03	110	4.8E-05		2.6E-03	2.4E-05	2.6E-03	2.4E-05
Nitroaniline, 4-	100-01-6	5.3E-03	9,000	5.8E-07		2.6E-03	2.9E-07	2.6E-03	2.9E-07
Nitrobenzene	98-95-3	1.5E-03	9,100	1.6E-07		7.5E-04	8.2E-08	7.5E-04	8.2E-08
Nitrophenol, 2-	88-75-5	1.1E-02	1,000	1.1E-05		5.6E-03	5.6E-06	5.6E-03	5.6E-06
Nitrophenol, 4-	100-02-7	8.7E-03	1,200	7.2E-06		4.3E-03	3.6E-06	4.3E-03	3.6E-06
Nitroso-di-n-butylamine, n-	924-16-3	1.3E-03	2,000	6.6E-07		6.6E-04	3.3E-07	6.6E-04	3.3E-07
Nitrosodiphenylamine, N-	86-30-6	2.3E-04	1,400	1.7E-07		1.2E-04	8.3E-08	1.2E-04	8.3E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Nitrosodipropylamine, n-	621-64-7	1.3E-03	2,000	6.6E-07		6.6E-04	3.3E-07	6.6E-04	3.3E-07
n-Nitrosodiethylamine	55-18-5	1.3E-03	1,700	7.7E-07		6.6E-04	3.9E-07	6.6E-04	3.9E-07
n-Nitrosodimethylamine	62-75-9	1.3E-03	1,700	7.9E-07		6.7E-04	3.9E-07	6.7E-04	3.9E-07
n-Nitrosomethylethylamine	10595-95-6	2.2E-03	1,700	1.3E-06		1.1E-03	6.4E-07	1.1E-03	6.4E-07
n-Nitrosomorpholine	59-89-2	1.3E-03	74	1.8E-05		6.6E-04	8.9E-06	6.6E-04	8.9E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	8.6E-08	3	2.9E-08		4.3E-08	1.4E-08	4.3E-08	1.4E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.2E-06	75	1.6E-08		6.2E-07	8.2E-09	6.2E-07	8.2E-09
o-Tolualdehyde	529-20-4	9.6E-02	17,000	5.6E-06		4.8E-02	2.8E-06	4.8E-02	2.8E-06
p-Dimethylaminoazobenzene	60-11-7	1.3E-03	670	1.9E-06		6.4E-04	9.5E-07	6.4E-04	9.5E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	1.6E-08	0.1	1.6E-07		7.8E-09	7.8E-08	7.8E-09	7.8E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	1.9E-07	0.24	7.8E-07		9.4E-08	3.9E-07	9.4E-08	3.9E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	3.8E-07	0.074	5.1E-06		1.9E-07	2.5E-06	1.9E-07	2.5E-06
Pentachlorobenzene	608-93-5	1.3E-03	1,600	8.2E-07		6.6E-04	4.1E-07	6.6E-04	4.1E-07
Pentachloroethane	76-01-7	1.7E-03	320,000	5.2E-09		8.4E-04	2.6E-09	8.4E-04	2.6E-09
Pentachloronitrobenzene	82-68-8	1.4E-03	1,500	9.3E-07		7.0E-04	4.6E-07	7.0E-04	4.6E-07
Pentachlorophenol	87-86-5	6.6E-02	1,400	4.7E-05		3.3E-02	2.3E-05	3.3E-02	2.3E-05
Perchlorate	14797-73-0	1.1E-03	23	5.0E-05		5.7E-04	2.5E-05	5.7E-04	2.5E-05
Phenanthrene	85-01-8	7.6E-03	760	1.0E-05		3.8E-03	5.0E-06	3.8E-03	5.0E-06
Phenol	108-95-2	7.2E-03	5,800	1.2E-06		3.6E-03	6.2E-07	3.6E-03	6.2E-07
Phosphorous	7723-14-0	2.5E-01	270	9.3E-04		1.3E-01	4.6E-04	1.3E-01	4.6E-04
Propanal	123-38-6	1.2E-01	110,000	1.1E-06		6.2E-02	5.7E-07	6.2E-02	5.7E-07
Propylbenzene	103-65-1	1.1E-02	5,400	2.0E-06		5.5E-03	1.0E-06	5.5E-03	1.0E-06
Propylene	115-07-1	1.2E-01	860,000	1.4E-07		5.9E-02	6.8E-08	5.9E-02	6.8E-08
Pyrene	129-00-0	5.4E-03	150	3.6E-05		2.7E-03	1.8E-05	2.7E-03	1.8E-05
Pyridine	110-86-1	1.9E-03	9,700	2.0E-07		9.7E-04	1.0E-07	9.7E-04	1.0E-07
Selenium	7782-49-2	3.7E-03	200	1.8E-05		1.8E-03	9.1E-06	1.8E-03	9.1E-06
Silver	7440-22-4	2.7E-03	100	2.7E-05		1.4E-03	1.4E-05	1.4E-03	1.4E-05
Styrene	100-42-5	3.1E-03	21,000	1.5E-07		1.6E-03	7.4E-08	1.6E-03	7.4E-08
TetraCDD, 2,3,7,8-	1746-01-6	5.5E-09	0.00003	1.8E-04		2.7E-09	9.1E-05	2.7E-09	9.1E-05
TetraCDF, 2,3,7,8-	51207-31-9	9.5E-08	0.074	1.3E-06		4.8E-08	6.4E-07	4.8E-08	6.4E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.3E-03	240	5.5E-06		6.6E-04	2.7E-06	6.6E-04	2.7E-06

Source M-136 A and M-225, Acute HQs and Hi, Christensen Ranch, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Tetrachloroethane, 1,1,2,2-	79-34-5	1.0E-03	7,000	1.4E-07		5.0E-04	7.2E-08	5.0E-04	7.2E-08
Tetrachloroethylene	127-18-4	6.0E-03	20,000	3.0E-07		3.0E-03	1.5E-07	3.0E-03	1.5E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.7E-03	1,300	1.3E-06		8.5E-04	6.6E-07	8.5E-04	6.6E-07
Tetrahydrofuran	109-99-9	2.2E-03	290,000	7.5E-09		1.1E-03	3.7E-09	1.1E-03	3.7E-09
Toluene	108-88-3	6.7E-02	37,000	1.8E-06		3.4E-02	9.1E-07	3.4E-02	9.1E-07
Toluidine, o-	95-53-4	1.7E-02	8,800	1.9E-06		8.4E-03	9.5E-07	8.4E-03	9.5E-07
Trans-1,3-dichloropropene	10061-02-6	1.5E-03	75,000	2.0E-08		7.3E-04	9.7E-09	7.3E-04	9.7E-09
trans-2-Butene	624-64-6	1.8E-02	1,000,000	1.8E-08		9.2E-03	9.2E-09	9.2E-03	9.2E-09
Trichlorobenzene, 1,2,4-	120-82-1	1.6E-03	3,400	4.6E-07		7.7E-04	2.3E-07	7.7E-04	2.3E-07
Trichloroethane, 1,1,1-	71-55-6	6.5E-04	1,300,000	5.0E-10		3.2E-04	2.5E-10	3.2E-04	2.5E-10
Trichloroethane, 1,1,2-	79-00-5	1.8E-03	81,000	2.2E-08		8.7E-04	1.1E-08	8.7E-04	1.1E-08
Trichloroethylene	79-01-6	2.3E-03	700,000	3.2E-09		1.1E-03	1.6E-09	1.1E-03	1.6E-09
Trichlorophenol, 2,4,5-	95-95-4	3.4E-03	7,400	4.6E-07		1.7E-03	2.3E-07	1.7E-03	2.3E-07
Trichlorophenol, 2,4,6-	88-06-2	3.1E-03	1,800	1.7E-06		1.6E-03	8.7E-07	1.6E-03	8.7E-07
Trimethylbenzene, 1,3,5-	108-67-8	4.6E-02	690,000	6.6E-08		2.3E-02	3.3E-08	2.3E-02	3.3E-08
Trinitrobenzene, 1,3,5	99-35-4	1.3E-03	530	2.5E-06		6.6E-04	1.2E-06	6.6E-04	1.2E-06
Undecane	1120-21-4	2.9E-02	1,500	1.9E-05		1.4E-02	9.6E-06	1.4E-02	9.6E-06
Vinyl Chloride	75-01-4	1.8E-02	180,000	1.0E-07		9.1E-03	5.1E-08	9.1E-03	5.1E-08
Xylene, m-	108-38-3	2.6E-02	22,000	1.2E-06		1.3E-02	6.0E-07	1.3E-02	6.0E-07
Xylene, o-	95-47-6	3.1E-02	22,000	1.4E-06		1.6E-02	7.1E-07	1.6E-02	7.1E-07
Xylene, p-	106-42-3	2.6E-02	22,000	1.2E-06		1.3E-02	6.0E-07	1.3E-02	6.0E-07
Zinc	7440-66-6	1.3E-01	1,900	6.7E-05		6.4E-02	3.4E-05	6.4E-02	3.4E-05
			Total	**0.9**		**Total**	**0.4**	**With adjusted Ni & Cr**	**0.1**

Chromium adjustment factor **0.05**
Nickel adjustment factor **0.017**

Source M-136 A and M-225 A, Acute HQs and HI Holmgren Ranch, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	5.6E-04	690,000	8.2E-10		2.8E-04	4.1E-10	2.8E-04	4.1E-10
1,2,4-Trimethylbenzene	95-63-6	3.4E-02	690,000	4.9E-08		1.7E-02	2.4E-08	1.7E-02	2.4E-08
1,4-Diethylbenzene	105-05-5	9.0E-04	12,000	7.5E-08		4.5E-04	3.7E-08	4.5E-04	3.7E-08
1-Butene	106-98-9	3.0E-02	1,200,000	2.5E-08		1.5E-02	1.2E-08	1.5E-02	1.2E-08
1-Chloronapthalene	90-13-1	7.4E-04	4,600	1.6E-07		3.7E-04	8.0E-08	3.7E-04	8.0E-08
1-Naphthylamine	134-32-7	1.5E-02	210	7.0E-05		7.4E-03	3.5E-05	7.4E-03	3.5E-05
2,2,4-Trimethylpentane	540-84-1	3.2E-02	14,000,000	2.3E-09		1.6E-02	1.2E-09	1.6E-02	1.2E-09
2,2-Dimethylbutane	75-83-2	1.9E-03	1,800,000	1.0E-09		9.4E-04	5.2E-10	9.4E-04	5.2E-10
2,3,4-Trimethylpentane	565-75-3	1.1E-02	14,000,000	7.9E-10		5.5E-03	3.9E-10	5.5E-03	3.9E-10
2,3-Dimethylbutane	79-29-8	4.7E-03	1,800,000	2.6E-09		2.3E-03	1.3E-09	2.3E-03	1.3E-09
2,3-Dimethylpentane	565-59-3	1.9E-02	1,800,000	1.0E-08		9.4E-03	5.2E-09	9.4E-03	5.2E-09
2,4-Dimethylpentane	108-08-7	7.0E-03	180,000	3.9E-08		3.5E-03	1.9E-08	3.5E-03	1.9E-08
2,5-Dimethylbenzaldehyde	5779-94-2	3.6E-02	17,000	2.1E-06		1.8E-02	1.1E-06	1.8E-02	1.1E-06
2,6-Dichlorophenol	87-65-0	7.4E-04	8,800	8.4E-08		3.7E-04	4.2E-08	3.7E-04	4.2E-08
2-Ethyltoluene	611-14-3	6.0E-04	12,000	5.0E-08		3.0E-04	2.5E-08	3.0E-04	2.5E-08
2-Hexanone	591-78-6	2.7E-03	41,000	6.6E-08		1.3E-03	3.3E-08	1.3E-03	3.3E-08
2-Methylhexane	591-76-4	2.3E-02	1,800,000	1.3E-08		1.1E-02	6.3E-09	1.1E-02	6.3E-09
2-Methylnaphthalene	91-57-6	1.0E-02	3,000	3.3E-06		5.0E-03	1.7E-06	5.0E-03	1.7E-06
2-Methylpentane	107-83-5	1.5E-02	1,800,000	8.2E-09		7.4E-03	4.1E-09	7.4E-03	4.1E-09
2-Naphthylamine	91-59-8	1.5E-02	320	4.6E-05		7.3E-03	2.3E-05	7.3E-03	2.3E-05
3-Ethyltoluene	620-14-4	6.5E-03	12,000	5.4E-07		3.2E-03	2.7E-07	3.2E-03	2.7E-07
3-Methylheptane	589-81-1	4.7E-03	1,400,000	3.4E-09		2.3E-03	1.7E-09	2.3E-03	1.7E-09
3-Methylhexane	589-34-4	3.0E-02	1,800,000	1.6E-08		1.5E-02	8.2E-09	1.5E-02	8.2E-09
3-Methylpentane	96-14-0	9.5E-03	1,800,000	5.3E-09		4.8E-03	2.6E-09	4.8E-03	2.6E-09
4,6-Dinitro-2-methylphenol	534-52-1	1.3E-02	200	6.4E-05		6.4E-03	3.2E-05	6.4E-03	3.2E-05
4-Aminobyphenyl	92-67-1	1.5E-02	490	3.0E-05		7.4E-03	1.5E-05	7.4E-03	1.5E-05
4-Ethyltoluene	622-96-8	7.1E-03	12,000	5.9E-07		3.6E-03	3.0E-07	3.6E-03	3.0E-07
Acenaphthene	83-32-9	7.4E-04	3,600	2.0E-07		3.7E-04	1.0E-07	3.7E-04	1.0E-07
Acenaphthylene	208-96-8	4.1E-03	10,000	4.1E-07		2.1E-03	2.1E-07	2.1E-03	2.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	1.3E-01	470	2.7E-04		6.2E-02	1.3E-04	6.2E-02	1.3E-04
Acetone	67-64-1	3.2E-02	470,000	6.9E-08		1.6E-02	3.4E-08	1.6E-02	3.4E-08
Acetonitrile	75-05-8	2.6E-02	22,000	1.2E-06		1.3E-02	5.8E-07	1.3E-02	5.8E-07
Acetophenone	98-86-2	3.6E-03	10,000	3.6E-07		1.8E-03	1.8E-07	1.8E-03	1.8E-07
Acrylonitrile	107-13-1	2.2E-02	10,000	2.2E-06		1.1E-02	1.1E-06	1.1E-02	1.1E-06
Aluminum	7429-90-5	5.1E+01	3,000	1.7E-02		2.5E+01	8.4E-03	2.5E+01	8.4E-03
Aniline	62-53-3	1.1E-02	30,000	3.6E-07		5.4E-03	1.8E-07	5.4E-03	1.8E-07
Anthracene	120-12-7	1.7E-04	270	6.5E-07		8.7E-05	3.2E-07	8.7E-05	3.2E-07
Antimony	7440-36-0	3.9E-02	500	7.8E-05		1.9E-02	3.9E-05	1.9E-02	3.9E-05
Arsenic	7440-38-2	7.0E-04	0.20	3.5E-03		3.5E-04	1.7E-03	3.5E-04	1.7E-03
Barium	7440-39-3	4.9E-04	1,500	3.3E-07		2.5E-04	1.6E-07	2.5E-04	1.6E-07
Benzaldehyde	100-52-7	5.1E-02	17,000	3.0E-06		2.5E-02	1.5E-06	2.5E-02	1.5E-06
Benzene	71-43-2	1.6E-01	27	6.0E-03		8.1E-02	3.0E-03	8.1E-02	3.0E-03
Benzo(a)anthracene	56-55-3	7.7E-04	1,200	6.4E-07		3.9E-04	3.2E-07	3.9E-04	3.2E-07
Benzo(a)pyrene	50-32-8	1.0E-04	600	1.7E-07		5.0E-05	8.4E-08	5.0E-05	8.4E-08
Benzo(b)fluoranthene	205-99-2	1.5E-03	31	5.0E-05		7.7E-04	2.5E-05	7.7E-04	2.5E-05
Benzo(g,h,i)perylene	191-24-2	5.8E-04	30,000	1.9E-08		2.9E-04	9.6E-09	2.9E-04	9.6E-09
Benzo(k)fluoranthene	207-08-9	1.5E-03	19	7.9E-05		7.5E-04	3.9E-05	7.5E-04	3.9E-05
Benzoic acid	65-85-0	8.4E-02	2,800	3.0E-05		4.2E-02	1.5E-05	4.2E-02	1.5E-05
Benzyl alcohol	100-51-6	1.0E-03	130,000	8.0E-09		5.2E-04	4.0E-09	5.2E-04	4.0E-09
Benzyl chloride	100-44-7	7.7E-04	240	3.2E-06		3.8E-04	1.6E-06	3.8E-04	1.6E-06
Bis(2-chlorethyl)ether	111-44-4	8.2E-04	58,000	1.4E-08		4.1E-04	7.1E-09	4.1E-04	7.1E-09
Bis(2-chloroethoxy)methane	111-91-1	7.4E-04	920	8.0E-07		3.7E-04	4.0E-07	3.7E-04	4.0E-07
Bromodichloromethane	75-27-4	1.0E-03	260	4.0E-06		5.2E-04	2.0E-06	5.2E-04	2.0E-06
Bromoform	75-25-2	1.7E-03	15,000	1.2E-07		8.7E-04	5.8E-08	8.7E-04	5.8E-08
Bromophenyl-phenylether, 4-	101-55-3	7.4E-04	290	2.5E-06		3.7E-04	1.3E-06	3.7E-04	1.3E-06
Butylbenzylphthalate	85-68-7	2.0E-04	15,000	1.3E-08		1.0E-04	6.7E-09	1.0E-04	6.7E-09
Cadmium	7440-43-9	6.0E-05	100	6.0E-07		3.0E-05	3.0E-07	3.0E-05	3.0E-07
Carbazole	86-74-8	9.4E-04	660	1.4E-06		4.7E-04	7.1E-07	4.7E-04	7.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	1.3E-02	6,200	2.1E-06		6.6E-03	1.1E-06	6.6E-03	1.1E-06
Carbon tetrachloride	56-23-5	2.0E-02	1,900	1.1E-05		1.0E-02	5.3E-06	1.0E-02	5.3E-06
Chlorine	7782-50-5	1.6E+01	210	7.6E-02		7.9E+00	3.8E-02	7.9E+00	3.8E-02
Chloro-3-methylphenol, 4-	59-50-7	9.1E-04	5,500	1.7E-07		4.6E-04	8.3E-08	4.6E-04	8.3E-08
Chloroacetonitrile	107-14-2	1.5E-03	9,000	1.6E-07		7.4E-04	8.2E-08	7.4E-04	8.2E-08
Chloroaniline, p-	106-47-8	2.1E-04	2,200	9.5E-08		1.0E-04	4.7E-08	1.0E-04	4.7E-08
Chlorobenzene	108-90-7	3.4E-03	46,000	7.3E-08		1.7E-03	3.6E-08	1.7E-03	3.6E-08
Chloroethane	75-00-3	5.9E-04	260,000	2.3E-09		3.0E-04	1.1E-09	3.0E-04	1.1E-09
Chloroform (Trichloromethane)	67-66-3	8.2E-03	150	5.5E-05		4.1E-03	2.7E-05	4.1E-03	2.7E-05
Chloronaphthalene,2-	91-58-7	7.4E-04	600	1.2E-06		3.7E-04	6.1E-07	3.7E-04	6.1E-07
Chlorophenol, 2-	95-57-8	2.6E-03	1,300	2.0E-06		1.3E-03	9.9E-07	1.3E-03	9.9E-07
Chromium III	7440-47-3	1.4E-02	1,500	9.3E-06		7.0E-03	4.6E-06	3.5E-04	2.3E-07
Chromium, hexavalent	18540-29-9	1.1E-02	89	1.3E-04		5.7E-03	6.4E-05	2.8E-04	3.2E-06
Chrysene	218-01-9	9.6E-04	600	1.6E-06		4.8E-04	8.0E-07	4.8E-04	8.0E-07
Cis-1,3-dichloropropene	10062-01-5	1.7E-03	600	2.9E-06		8.7E-04	1.5E-06	8.7E-04	1.5E-06
cis-2-Butene	590-18-1	2.3E-03	150,000,000	1.5E-11		1.1E-03	7.6E-12	1.1E-03	7.6E-12
Cobalt	7440-48-4	1.5E-04	180	8.4E-07		7.6E-05	4.2E-07	7.6E-05	4.2E-07
Copper	7440-50-8	3.2E-02	100	3.2E-04		1.6E-02	1.6E-04	1.6E-02	1.6E-04
Cresol, m-	108-39-4	1.7E-04	20,000	8.6E-09		8.6E-05	4.3E-09	8.6E-05	4.3E-09
Cresol, o-	95-48-7	4.4E-03	20,000	2.2E-07		2.2E-03	1.1E-07	2.2E-03	1.1E-07
Cresol, p-	106-44-5	1.7E-04	20,000	8.6E-09		8.6E-05	4.3E-09	8.6E-05	4.3E-09
Crotonaldehyde	4170-30-3	4.3E-03	540	8.0E-06		2.1E-03	4.0E-06	2.1E-03	4.0E-06
Cumene	98-82-8	5.6E-04	250,000	2.3E-09		2.8E-04	1.1E-09	2.8E-04	1.1E-09
Cyclohexane	110-82-7	3.4E-03	340,000	9.9E-09		1.7E-03	4.9E-09	1.7E-03	4.9E-09
Dibenz(a,h)anthracene	53-70-3	1.3E-04	34	3.9E-06		6.6E-05	1.9E-06	6.6E-05	1.9E-06
Dibenzofuran	132-64-9	7.4E-04	30,000	2.5E-08		3.7E-04	1.2E-08	3.7E-04	1.2E-08
Dibromochloromethane	124-48-1	1.2E-03	7,400	1.6E-07		5.9E-04	8.0E-08	5.9E-04	8.0E-08
Dichlorobenzene, 1,2-	95-50-1	7.5E-04	300,000	2.5E-09		3.8E-04	1.3E-09	3.8E-04	1.3E-09
Dichlorobenzene, 1,3-	541-73-1	8.4E-04	16,000	5.2E-08		4.2E-04	2.6E-08	4.2E-04	2.6E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	7.8E-04	60,000	1.3E-08		3.9E-04	6.5E-09	3.9E-04	6.5E-09
Dichloroethane 1,1-	75-34-3	4.3E-04	650,000	6.6E-10		2.1E-04	3.3E-10	2.1E-04	3.3E-10
Dichloroethane, 1,2	107-06-2	7.3E-04	200,000	3.6E-09		3.6E-04	1.8E-09	3.6E-04	1.8E-09
Dichloroethylene 1,1-	75-35-4	5.8E-04	180,000	3.2E-09		2.9E-04	1.6E-09	2.9E-04	1.6E-09
Dichloroethylene, cis-1,2-	156-59-2	1.6E-04	560,000	2.9E-10		8.1E-05	1.4E-10	8.1E-05	1.4E-10
Dichloroethylene-1,2 (trans)	156-60-5	9.7E-04	1,100,000	8.8E-10		4.8E-04	4.4E-10	4.8E-04	4.4E-10
Dichlorophenol, 2,4-	120-83-2	1.2E-03	1,300	9.6E-07		6.2E-04	4.8E-07	6.2E-04	4.8E-07
Dichloropropane, 1,2-	78-87-5	5.0E-04	140,000	3.6E-09		2.5E-04	1.8E-09	2.5E-04	1.8E-09
Diethyl phthalate	84-66-2	1.1E-03	5,000	2.2E-07		5.4E-04	1.1E-07	5.4E-04	1.1E-07
Dimethyl phthalate	131-11-3	7.4E-04	15,000	4.9E-08		3.7E-04	2.5E-08	3.7E-04	2.5E-08
Dimethylphenol, 2,4-	105-67-9	9.3E-03	4,500	2.1E-06		4.6E-03	1.0E-06	4.6E-03	1.0E-06
Di-n-butyl phthalate	84-74-2	1.5E-02	15,000	9.9E-07		7.4E-03	4.9E-07	7.4E-03	4.9E-07
Dinitrobenzene, 1,3-	99-65-0	7.7E-04	1,000	7.7E-07		3.8E-04	3.8E-07	3.8E-04	3.8E-07
Dinitrophenol, 2,4-	51-28-5	3.2E-02	220	1.5E-04		1.6E-02	7.3E-05	1.6E-02	7.3E-05
Dinitrotoluene, 2,4-	121-14-2	7.4E-04	600	1.2E-06		3.7E-04	6.1E-07	3.7E-04	6.1E-07
Dinitrotoluene, 2,6-	606-20-2	7.6E-04	600	1.3E-06		3.8E-04	6.3E-07	3.8E-04	6.3E-07
Di-n-octylphthalate	117-84-0	4.9E-03	6,800	7.3E-07		2.5E-03	3.6E-07	2.5E-03	3.6E-07
Dioxane, 1,4-	123-91-1	8.6E-04	3,000	2.9E-07		4.3E-04	1.4E-07	4.3E-04	1.4E-07
Diphenylamine	122-39-4	7.4E-04	30,000	2.5E-08		3.7E-04	1.2E-08	3.7E-04	1.2E-08
Ethyl methacrylate	97-63-2	2.2E-03	13,000	1.7E-07		1.1E-03	8.3E-08	1.1E-03	8.3E-08
Ethylbenzene	100-41-4	1.5E-02	140,000	1.1E-07		7.4E-03	5.3E-08	7.4E-03	5.3E-08
Ethylene Dibromide	106-93-4	1.2E-03	130,000	9.2E-09		6.0E-04	4.6E-09	6.0E-04	4.6E-09
Ethylether	60-29-7	3.4E-03	1,500,000	2.2E-09		1.7E-03	1.1E-09	1.7E-03	1.1E-09
Ethylhexyl phthalate, bis-2-	117-81-7	1.5E-03	10,000	1.5E-07		7.6E-04	7.6E-08	7.6E-04	7.6E-08
Fluoranthene	206-44-0	3.5E-03	1,500	2.4E-06		1.8E-03	1.2E-06	1.8E-03	1.2E-06
Fluorene	86-73-7	8.8E-04	6,600	1.3E-07		4.4E-04	6.6E-08	4.4E-04	6.6E-08
Formaldehyde	50-00-0	6.3E-02	55	1.1E-03		3.2E-02	5.7E-04	3.2E-02	5.7E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	3.7E-08	3	1.2E-08		1.9E-08	6.2E-09	1.9E-08	6.2E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	9.4E-07	45	2.1E-08		4.7E-07	1.0E-08	4.7E-07	1.0E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	2.5E-07	60	4.1E-09		1.2E-07	2.0E-09	1.2E-07	2.0E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	4.5E-09	0.07	6.1E-08		2.3E-09	3.1E-08	2.3E-09	3.1E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.2E-08	0.75	1.5E-08		5.7E-09	7.7E-09	5.7E-09	7.7E-09
HexaCDD, 1,2,3,7,8,9-	19408-74-3	7.9E-09	4	2.0E-09		3.9E-09	1.0E-09	3.9E-09	1.0E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	3.4E-07	0.07	4.5E-06		1.7E-07	2.3E-06	1.7E-07	2.3E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	2.1E-07	0.04	5.6E-06		1.0E-07	2.8E-06	1.0E-07	2.8E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.6E-07	30	5.2E-09		7.8E-08	2.6E-09	7.8E-08	2.6E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	2.5E-07	0.49	5.0E-07		1.2E-07	2.5E-07	1.2E-07	2.5E-07
Hexachloro-1,3-butadiene	87-68-3	1.1E-03	11,000	9.9E-08		5.4E-04	4.9E-08	5.4E-04	4.9E-08
Hexachlorobenzene	118-74-1	6.3E-03	6	1.0E-03		3.1E-03	5.2E-04	3.1E-03	5.2E-04
Hexachlorocyclopentadiene	77-47-4	1.5E-02	110	1.3E-04		7.4E-03	6.7E-05	7.4E-03	6.7E-05
Hexachloroethane (Perchloroethane)	67-72-1	7.9E-04	29,000	2.7E-08		4.0E-04	1.4E-08	4.0E-04	1.4E-08
Hexachloropropene	1888-71-7	1.1E-03	905	1.2E-06		5.3E-04	5.8E-07	5.3E-04	5.8E-07
Hexane	110-54-3	1.3E-02	1,100,000	1.2E-08		6.6E-03	6.0E-09	6.6E-03	6.0E-09
Hydrogen chloride	7647-01-0	2.4E+01	2,100	1.1E-02		1.2E+01	5.7E-03	1.2E+01	5.7E-03
Indeno(1,2,3-cd) pyrene	193-39-5	5.0E-04	15	3.4E-05		2.5E-04	1.7E-05	2.5E-04	1.7E-05
Isophorone	78-59-1	7.4E-04	23,000	3.2E-08		3.7E-04	1.6E-08	3.7E-04	1.6E-08
Lead	7439-92-1	5.2E-02	150	3.5E-04		2.6E-02	1.7E-04	2.6E-02	1.7E-04
Manganese	7439-96-5	1.2E-01	3,000	4.0E-05		5.9E-02	2.0E-05	5.9E-02	2.0E-05
Mercuric chloride	7487-94-7	6.9E-06	2,700	2.6E-09		3.4E-06	1.3E-09	3.4E-06	1.3E-09
Methacrylonitrile	126-98-7	7.9E-03	2,700	2.9E-06		4.0E-03	1.5E-06	4.0E-03	1.5E-06
Methyl bromide	74-83-9	1.6E-04	3,900	4.1E-08		8.1E-05	2.1E-08	8.1E-05	2.1E-08
Methyl chloride	74-87-3	1.9E-02	210,000	9.0E-08		9.4E-03	4.5E-08	9.4E-03	4.5E-08
Methyl ethyl ketone	78-93-3	5.2E-03	13,000	4.0E-07		2.6E-03	2.0E-07	2.6E-03	2.0E-07
Methyl isobutyl ketone	108-10-1	1.1E-03	310,000	3.6E-09		5.5E-04	1.8E-09	5.5E-04	1.8E-09
Methyl tert-butyl ether	1634-04-4	1.7E-02	180,000	9.7E-08		8.7E-03	4.8E-08	8.7E-03	4.8E-08
Methylcyclohexane	108-87-2	1.6E-02	1,600,000	1.0E-08		8.1E-03	5.0E-09	8.1E-03	5.0E-09
Methylene chloride	75-09-2	3.2E-01	14,000	2.3E-05		1.6E-01	1.2E-05	1.6E-01	1.2E-05
Methylmethacrylate	80-62-6	2.2E-03	70,000	3.1E-08		1.1E-03	1.5E-08	1.1E-03	1.5E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	1.2E-01	79,000	1.6E-06		6.1E-02	7.8E-07	6.1E-02	7.8E-07
Nickel	7440-02-0	7.4E-02	0.20	3.7E-01		3.7E-02	1.8E-01	6.3E-04	3.2E-03
Nitroaniline, 2-	88-74-4	7.4E-04	4,800	1.5E-07		3.7E-04	7.7E-08	3.7E-04	7.7E-08
Nitroaniline, 3-	99-09-2	2.9E-03	110	2.7E-05		1.5E-03	1.3E-05	1.5E-03	1.3E-05
Nitroaniline, 4-	100-01-6	2.9E-03	9,000	3.3E-07		1.5E-03	1.6E-07	1.5E-03	1.6E-07
Nitrobenzene	98-95-3	8.4E-04	9,100	9.2E-08		4.2E-04	4.6E-08	4.2E-04	4.6E-08
Nitrophenol, 2-	88-75-5	6.3E-03	1,000	6.3E-06		3.2E-03	3.2E-06	3.2E-03	3.2E-06
Nitrophenol, 4-	100-02-7	4.9E-03	1,200	4.0E-06		2.4E-03	2.0E-06	2.4E-03	2.0E-06
Nitroso-di-n-butylamine, n-	924-16-3	7.4E-04	2,000	3.7E-07		3.7E-04	1.8E-07	3.7E-04	1.8E-07
Nitrosodiphenylamine, N-	86-30-6	1.3E-04	1,400	9.4E-08		6.5E-05	4.7E-08	6.5E-05	4.7E-08
Nitrosodipropylamine, n-	621-64-7	7.4E-04	2,000	3.7E-07		3.7E-04	1.8E-07	3.7E-04	1.8E-07
n-Nitrosodiethylamine	55-18-5	7.4E-04	1,700	4.3E-07		3.7E-04	2.2E-07	3.7E-04	2.2E-07
n-Nitrosodimethylamine	62-75-9	7.5E-04	1,700	4.4E-07		3.7E-04	2.2E-07	3.7E-04	2.2E-07
n-Nitrosomethylethylamine	10595-95-6	1.2E-03	1,700	7.2E-07		6.1E-04	3.6E-07	6.1E-04	3.6E-07
n-Nitrosomorpholine	59-89-2	7.4E-04	74	1.0E-05		3.7E-04	5.0E-06	3.7E-04	5.0E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	4.8E-08	3	1.6E-08		2.4E-08	8.0E-09	2.4E-08	8.0E-09
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	6.8E-07	75	9.1E-09		3.4E-07	4.6E-09	3.4E-07	4.6E-09
o-Tolualdehyde	529-20-4	5.4E-02	17,000	3.2E-06		2.7E-02	1.6E-06	2.7E-02	1.6E-06
p-Dimethylaminoazobenzene	60-11-7	7.1E-04	670	1.1E-06		3.5E-04	5.3E-07	3.5E-04	5.3E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	8.7E-09	0.10	8.7E-08		4.3E-09	4.3E-08	4.3E-09	4.3E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	1.0E-07	0.24	4.4E-07		5.2E-08	2.2E-07	5.2E-08	2.2E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	2.1E-07	0.07	2.8E-06		1.0E-07	1.4E-06	1.0E-07	1.4E-06
Pentachlorobenzene	608-93-5	7.4E-04	1,600	4.6E-07		3.7E-04	2.3E-07	3.7E-04	2.3E-07
Pentachloroethane	76-01-7	9.4E-04	320,000	2.9E-09		4.7E-04	1.5E-09	4.7E-04	1.5E-09
Pentachloronitrobenzene	82-68-8	7.8E-04	1,500	5.2E-07		3.9E-04	2.6E-07	3.9E-04	2.6E-07
Pentachlorophenol	87-86-5	3.7E-02	1,400	2.6E-05		1.8E-02	1.3E-05	1.8E-02	1.3E-05
Perchlorate	14797-73-0	6.3E-04	23	2.8E-05		3.2E-04	1.4E-05	3.2E-04	1.4E-05
Phenanthrene	85-01-8	4.3E-03	760	5.6E-06		2.1E-03	2.8E-06	2.1E-03	2.8E-06
Phenol	108-95-2	4.0E-03	5,800	6.9E-07		2.0E-03	3.4E-07	2.0E-03	3.4E-07

Source M-136 A and M-225 A, Acute HQs and HI Holmgren Ranch, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	1.4E-01	270	5.2E-04		7.0E-02	2.6E-04	7.0E-02	2.6E-04
Propanal	123-38-6	7.0E-02	110,000	6.4E-07		3.5E-02	3.2E-07	3.5E-02	3.2E-07
Propylbenzene	103-65-1	6.2E-03	5,400	1.1E-06		3.1E-03	5.7E-07	3.1E-03	5.7E-07
Propylene	115-07-1	6.6E-02	860,000	7.7E-08		3.3E-02	3.8E-08	3.3E-02	3.8E-08
Pyrene	129-00-0	3.0E-03	150	2.0E-05		1.5E-03	1.0E-05	1.5E-03	1.0E-05
Pyridine	110-86-1	1.1E-03	9,700	1.1E-07		5.4E-04	5.6E-08	5.4E-04	5.6E-08
Selenium	7782-49-2	2.0E-03	200	1.0E-05		1.0E-03	5.1E-06	1.0E-03	5.1E-06
Silver	7440-22-4	1.5E-03	100	1.5E-05		7.6E-04	7.6E-06	7.6E-04	7.6E-06
Styrene	100-42-5	1.7E-03	21,000	8.3E-08		8.7E-04	4.2E-08	8.7E-04	4.2E-08
TetraCDD, 2,3,7,8-	1746-01-6	3.1E-09	0.00003	1.0E-04		1.5E-09	5.1E-05	1.5E-09	5.1E-05
TetraCDF, 2,3,7,8-	51207-31-9	5.3E-08	0.07	7.2E-07		2.7E-08	3.6E-07	2.7E-08	3.6E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	7.4E-04	240	3.1E-06		3.7E-04	1.5E-06	3.7E-04	1.5E-06
Tetrachloroethane, 1,1,2,2-	79-34-5	5.6E-04	7,000	8.1E-08		2.8E-04	4.0E-08	2.8E-04	4.0E-08
Tetrachloroethylene	127-18-4	3.4E-03	20,000	1.7E-07		1.7E-03	8.4E-08	1.7E-03	8.4E-08
Tetrachlorophenol, 2,3,4,6-	58-90-2	9.6E-04	1,300	7.4E-07		4.8E-04	3.7E-07	4.8E-04	3.7E-07
Tetrahydrofuran	109-99-9	1.2E-03	290,000	4.2E-09		6.0E-04	2.1E-09	6.0E-04	2.1E-09
Toluene	108-88-3	3.8E-02	37,000	1.0E-06		1.9E-02	5.1E-07	1.9E-02	5.1E-07
Toluidine, o-	95-53-4	9.4E-03	8,800	1.1E-06		4.7E-03	5.3E-07	4.7E-03	5.3E-07
Trans-1,3-dichloropropene	10061-02-6	8.2E-04	75,000	1.1E-08		4.1E-04	5.5E-09	4.1E-04	5.5E-09
trans-2-Butene	624-64-6	1.0E-02	1,000,000	1.0E-08		5.2E-03	5.2E-09	5.2E-03	5.2E-09
Trichlorobenzene, 1,2,4-	120-82-1	8.7E-04	3,400	2.6E-07		4.3E-04	1.3E-07	4.3E-04	1.3E-07
Trichloroethane, 1,1,1-	71-55-6	3.6E-04	1,300,000	2.8E-10		1.8E-04	1.4E-10	1.8E-04	1.4E-10
Trichloroethane, 1,1,2-	79-00-5	9.8E-04	81,000	1.2E-08		4.9E-04	6.0E-09	4.9E-04	6.0E-09
Trichloroethylene	79-01-6	1.3E-03	700,000	1.8E-09		6.3E-04	9.0E-10	6.3E-04	9.0E-10
Trichlorophenol, 2,4,5-	95-95-4	1.9E-03	7,400	2.6E-07		9.5E-04	1.3E-07	9.5E-04	1.3E-07
Trichlorophenol, 2,4,6-	88-06-2	1.8E-03	1,800	9.8E-07		8.8E-04	4.9E-07	8.8E-04	4.9E-07
Trimethylbenzene, 1,3,5-	108-67-8	2.6E-02	690,000	3.7E-08		1.3E-02	1.8E-08	1.3E-02	1.8E-08
Trinitrobenzene, 1,3,5	99-35-4	7.4E-04	530	1.4E-06		3.7E-04	6.9E-07	3.7E-04	6.9E-07
Undecane	1120-21-4	1.6E-02	1,500	1.1E-05		8.1E-03	5.4E-06	8.1E-03	5.4E-06

Source M-136 A and M-225 A, Acute HQs and HI Holmgren Ranch, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	1.0E-02	180,000	5.7E-08		5.1E-03	2.8E-08	5.1E-03	2.8E-08
Xylene, m-	108-38-3	1.5E-02	22,000	6.7E-07		7.4E-03	3.4E-07	7.4E-03	3.4E-07
Xylene, o-	95-47-6	1.7E-02	22,000	7.9E-07		8.7E-03	4.0E-07	8.7E-03	4.0E-07
Xylene, p-	106-42-3	1.5E-02	22,000	6.7E-07		7.4E-03	3.4E-07	7.4E-03	3.4E-07
Zinc	7440-66-6	7.1E-02	1,900	3.7E-05		3.5E-02	1.9E-05	3.5E-02	1.9E-05
			Total	**0.5**		**Total**	**0.2**	**With adjusted Ni & Cr**	**0.1**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	3.4E-04	690,000	4.9E-10		1.7E-04	2.4E-10	1.7E-04	2.4E-10
1,2,4-Trimethylbenzene	95-63-6	2.0E-02	690,000	2.9E-08		1.0E-02	1.4E-08	1.0E-02	1.4E-08
1,4-Diethylbenzene	105-05-5	5.4E-04	12,000	4.5E-08		2.7E-04	2.2E-08	2.7E-04	2.2E-08
1-butene	106-98-9	1.8E-02	1,200,000	1.5E-08		8.8E-03	7.3E-09	8.8E-03	7.3E-09
1-chloronapthalene	90-13-1	4.4E-04	4,600	9.5E-08		2.2E-04	4.7E-08	2.2E-04	4.7E-08
1-Naphthylamine	134-32-7	8.8E-03	210	4.2E-05		4.4E-03	2.1E-05	4.4E-03	2.1E-05
2,2,4-trimethylpentane	540-84-1	1.9E-02	14,000,000	1.4E-09		9.6E-03	6.8E-10	9.6E-03	6.8E-10
2,2-dimethylbutane	75-83-2	1.1E-03	1,800,000	6.2E-10		5.6E-04	3.1E-10	5.6E-04	3.1E-10
2,3,4-trimethylpentane	565-75-3	6.5E-03	14,000,000	4.7E-10		3.3E-03	2.3E-10	3.3E-03	2.3E-10
2,3-dimethylbutane	79-29-8	2.8E-03	1,800,000	1.6E-09		1.4E-03	7.7E-10	1.4E-03	7.7E-10
2,3-dimethylpentane	565-59-3	1.1E-02	1,800,000	6.2E-09		5.6E-03	3.1E-09	5.6E-03	3.1E-09
2,4-dimethylpentane	108-08-7	4.2E-03	180,000	2.3E-08		2.1E-03	1.2E-08	2.1E-03	1.2E-08
2,5-dimethylbenzaldehyde	5779-94-2	2.2E-02	17,000	1.3E-06		1.1E-02	6.3E-07	1.1E-02	6.3E-07
2,6-dichlorophenol	87-65-0	4.4E-04	8,800	5.0E-08		2.2E-04	2.5E-08	2.2E-04	2.5E-08
2-ethyltoluene	611-14-3	3.6E-04	12,000	3.0E-08		1.8E-04	1.5E-08	1.8E-04	1.5E-08
2-hexanone	591-78-6	1.6E-03	41,000	3.9E-08		8.0E-04	1.9E-08	8.0E-04	1.9E-08
2-methylhexane	591-76-4	1.4E-02	1,800,000	7.5E-09		6.8E-03	3.8E-09	6.8E-03	3.8E-09
2-methylnaphthalene	91-57-6	6.0E-03	3,000	2.0E-06		3.0E-03	9.9E-07	3.0E-03	9.9E-07
2-methylpentane	107-83-5	8.8E-03	1,800,000	4.9E-09		4.4E-03	2.4E-09	4.4E-03	2.4E-09
2-naphthylamine	91-59-8	8.5E-03	320	2.7E-05		4.3E-03	1.3E-05	4.3E-03	1.3E-05
3-ethyltoluene	620-14-4	3.8E-03	12,000	3.2E-07		1.9E-03	1.6E-07	1.9E-03	1.6E-07
3-methylheptane	589-81-1	2.8E-03	1,400,000	2.0E-09		1.4E-03	1.0E-09	1.4E-03	1.0E-09
3-methylhexane	589-34-4	1.8E-02	1,800,000	9.8E-09		8.8E-03	4.9E-09	8.8E-03	4.9E-09
3-methylpentane	96-14-0	5.7E-03	1,800,000	3.2E-09		2.8E-03	1.6E-09	2.8E-03	1.6E-09
4,6-dinitro-2-methylphenol	534-52-1	7.6E-03	200	3.8E-05		3.8E-03	1.9E-05	3.8E-03	1.9E-05
4-aminobyphenyl	92-67-1	8.7E-03	490	1.8E-05		4.4E-03	8.9E-06	4.4E-03	8.9E-06
4-ethyltoluene	622-96-8	4.2E-03	12,000	3.5E-07		2.1E-03	1.8E-07	2.1E-03	1.8E-07
Acenaphthene	83-32-9	4.4E-04	3,600	1.2E-07		2.2E-04	6.1E-08	2.2E-04	6.1E-08
acenaphthylene	208-96-8	2.5E-03	10,000	2.5E-07		1.2E-03	1.2E-07	1.2E-03	1.2E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	7.4E-02	470	1.6E-04		3.7E-02	7.9E-05	3.7E-02	7.9E-05
Acetone	67-64-1	1.9E-02	470,000	4.1E-08		9.6E-03	2.0E-08	9.6E-03	2.0E-08
Acetonitrile	75-05-8	1.5E-02	22,000	6.9E-07		7.6E-03	3.4E-07	7.6E-03	3.4E-07
Acetophenone	98-86-2	2.1E-03	10,000	2.1E-07		1.1E-03	1.1E-07	1.1E-03	1.1E-07
Acrylonitrile	107-13-1	1.3E-02	10,000	1.3E-06		6.4E-03	6.4E-07	6.4E-03	6.4E-07
aluminum	7429-90-5	2.7E+01	3,000	9.1E-03		1.4E+01	4.5E-03	1.4E+01	4.5E-03
Aniline	62-53-3	6.4E-03	30,000	2.1E-07		3.2E-03	1.1E-07	3.2E-03	1.1E-07
Anthracene	120-12-7	1.0E-04	270	3.8E-07		5.2E-05	1.9E-07	5.2E-05	1.9E-07
Antimony	7440-36-0	2.3E-02	500	4.6E-05		1.2E-02	2.3E-05	1.2E-02	2.3E-05
Arsenic	7440-38-2	3.7E-04	0.2	1.9E-03		1.9E-04	9.3E-04	1.9E-04	9.3E-04
Barium	7440-39-3	2.7E-04	1,500	1.8E-07		1.3E-04	8.8E-08	1.3E-04	8.8E-08
Benzaldehyde	100-52-7	3.0E-02	17,000	1.8E-06		1.5E-02	8.9E-07	1.5E-02	8.9E-07
Benzene	71-43-2	9.6E-02	27	3.5E-03		4.8E-02	1.8E-03	4.8E-02	1.8E-03
Benzo(a)anthracene	56-55-3	4.4E-04	1,200	3.7E-07		2.2E-04	1.8E-07	2.2E-04	1.8E-07
Benzo(a)pyrene	50-32-8	5.6E-05	600	9.4E-08		2.8E-05	4.7E-08	2.8E-05	4.7E-08
Benzo(b)fluoranthene	205-99-2	9.1E-04	31	3.0E-05		4.6E-04	1.5E-05	4.6E-04	1.5E-05
benzo(g,h,i)perylene	191-24-2	3.1E-04	30,000	1.0E-08		1.5E-04	5.1E-09	1.5E-04	5.1E-09
Benzo(k)fluoranthene	207-08-9	8.4E-04	19	4.4E-05		4.2E-04	2.2E-05	4.2E-04	2.2E-05
Benzoic acid	65-85-0	5.0E-02	2,800	1.8E-05		2.5E-02	8.9E-06	2.5E-02	8.9E-06
Benzyl alcohol	100-51-6	6.2E-04	130,000	4.8E-09		3.1E-04	2.4E-09	3.1E-04	2.4E-09
Benzyl chloride	100-44-7	4.6E-04	240	1.9E-06		2.3E-04	9.5E-07	2.3E-04	9.5E-07
Bis(2-chlorethyl)ether	111-44-4	4.9E-04	58,000	8.4E-09		2.4E-04	4.2E-09	2.4E-04	4.2E-09
bis(2-chloroethoxy)methane	111-91-1	4.4E-04	920	4.8E-07		2.2E-04	2.4E-07	2.2E-04	2.4E-07
Bromodichloromethane	75-27-4	6.2E-04	260	2.4E-06		3.1E-04	1.2E-06	3.1E-04	1.2E-06
Bromoform (Tribromomethane)	75-25-2	1.0E-03	15,000	6.9E-08		5.2E-04	3.5E-08	5.2E-04	3.5E-08
Bromophenyl-phenylether, 4-	101-55-3	4.4E-04	290	1.5E-06		2.2E-04	7.5E-07	2.2E-04	7.5E-07
Butylbenzylphthalate	85-68-7	1.2E-04	15,000	7.9E-09		5.9E-05	4.0E-09	5.9E-05	4.0E-09
Cadmium	7440-43-9	3.2E-05	100	3.2E-07		1.6E-05	1.6E-07	1.6E-05	1.6E-07
carbazole	86-74-8	5.6E-04	660	8.5E-07		2.8E-04	4.2E-07	2.8E-04	4.2E-07

Source M-136 A and M-225 A, Acute HQs and HI Howell Dairy, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	7.8E-03	6,200	1.3E-06		3.9E-03	6.3E-07	3.9E-03	6.3E-07
Carbon tetrachloride	56-23-5	1.2E-02	1,900	6.3E-06		6.0E-03	3.1E-06	6.0E-03	3.1E-06
Chlorine	7782-50-5	9.4E+00	210	4.5E-02		4.7E+00	2.2E-02	4.7E+00	2.2E-02
Chloro-3-methylphenol, 4-	59-50-7	5.4E-04	5,500	9.9E-08		2.7E-04	4.9E-08	2.7E-04	4.9E-08
chloroacetonitrile	107-14-2	8.8E-04	9,000	9.8E-08		4.4E-04	4.9E-08	4.4E-04	4.9E-08
Chloroaniline, p-	106-47-8	1.2E-04	2,200	5.6E-08		6.2E-05	2.8E-08	6.2E-05	2.8E-08
Chlorobenzene	108-90-7	2.0E-03	46,000	4.3E-08		1.0E-03	2.2E-08	1.0E-03	2.2E-08
Chloroethane	75-00-3	3.5E-04	260,000	1.4E-09		1.8E-04	6.7E-10	1.8E-04	6.7E-10
Chloroform (Trichloromethane)	67-66-3	4.9E-03	150	3.2E-05		2.4E-03	1.6E-05	2.4E-03	1.6E-05
Chloronaphthalene,2-	91-58-7	4.4E-04	600	7.3E-07		2.2E-04	3.6E-07	2.2E-04	3.6E-07
Chlorophenol, 2-	95-57-8	1.5E-03	1,300	1.2E-06		7.7E-04	5.9E-07	7.7E-04	5.9E-07
Chromium III	7440-47-3	7.5E-03	1,500	5.0E-06		3.7E-03	2.5E-06	1.9E-04	1.2E-07
Chromium, hexavalent	18540-29-9	6.1E-03	89	6.9E-05		3.1E-03	3.4E-05	1.5E-04	1.7E-06
Chrysene	218-01-9	5.6E-04	600	9.3E-07		2.8E-04	4.7E-07	2.8E-04	4.7E-07
cis-1,3-dichloropropene	10062-01-5	1.0E-03	600	1.7E-06		5.2E-04	8.6E-07	5.2E-04	8.6E-07
cis-2-butene	590-18-1	1.4E-03	150,000,000	9.1E-12		6.8E-04	4.5E-12	6.8E-04	4.5E-12
cobalt	7440-48-4	8.2E-05	180	4.5E-07		4.1E-05	2.3E-07	4.1E-05	2.3E-07
copper	7440-50-8	1.7E-02	100	1.7E-04		8.5E-03	8.5E-05	8.5E-03	8.5E-05
Cresol, m-	108-39-4	1.0E-04	20,000	5.1E-09		5.1E-05	2.6E-09	5.1E-05	2.6E-09
Cresol, o-	95-48-7	2.6E-03	20,000	1.3E-07		1.3E-03	6.6E-08	1.3E-03	6.6E-08
Cresol, p-	106-44-5	1.0E-04	20,000	5.1E-09		5.1E-05	2.6E-09	5.1E-05	2.6E-09
crotonaldehyde	4170-30-3	2.6E-03	540	4.7E-06		1.3E-03	2.4E-06	1.3E-03	2.4E-06
Cumene (Isopropylbenzene)	98-82-8	3.4E-04	250,000	1.3E-09		1.7E-04	6.7E-10	1.7E-04	6.7E-10
cyclohexane	110-82-7	2.0E-03	340,000	5.9E-09		1.0E-03	2.9E-09	1.0E-03	2.9E-09
Dibenz(a,h)anthracene	53-70-3	7.3E-05	34	2.1E-06		3.6E-05	1.1E-06	3.6E-05	1.1E-06
dibenzofuran	132-64-9	4.4E-04	30,000	1.5E-08		2.2E-04	7.3E-09	2.2E-04	7.3E-09
Dibromochloromethane	124-48-1	7.0E-04	7,400	9.5E-08		3.5E-04	4.7E-08	3.5E-04	4.7E-08
Dichlorobenzene, 1,2-	95-50-1	4.5E-04	300,000	1.5E-09		2.2E-04	7.4E-10	2.2E-04	7.4E-10
Dichlorobenzene, 1,3-	541-73-1	5.0E-04	16,000	3.1E-08		2.5E-04	1.6E-08	2.5E-04	1.6E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	4.6E-04	60,000	7.7E-09		2.3E-04	3.9E-09	2.3E-04	3.9E-09
Dichloroethane 1,1-	75-34-3	2.6E-04	650,000	3.9E-10		1.3E-04	2.0E-10	1.3E-04	2.0E-10
Dichloroethane, 1,2- (Ethylene Dichloride)	107-06-2	4.3E-04	200,000	2.2E-09		2.2E-04	1.1E-09	2.2E-04	1.1E-09
Dichloroethylene 1,1-	75-35-4	3.4E-04	180,000	1.9E-09		1.7E-04	9.5E-10	1.7E-04	9.5E-10
Dichloroethylene, cis-1,2-	156-59-2	9.6E-05	560,000	1.7E-10		4.8E-05	8.5E-11	4.8E-05	8.5E-11
Dichloroethylene-1,2 (trans)	156-60-5	5.8E-04	1,100,000	5.2E-10		2.9E-04	2.6E-10	2.9E-04	2.6E-10
Dichlorophenol, 2,4-	120-83-2	7.4E-04	1,300	5.7E-07		3.7E-04	2.8E-07	3.7E-04	2.8E-07
Dichloropropane, 1,2-	78-87-5	3.0E-04	140,000	2.1E-09		1.5E-04	1.1E-09	1.5E-04	1.1E-09
Diethyl phthalate	84-66-2	6.4E-04	5,000	1.3E-07		3.2E-04	6.4E-08	3.2E-04	6.4E-08
Dimethyl phthalate	131-11-3	4.4E-04	15,000	2.9E-08		2.2E-04	1.5E-08	2.2E-04	1.5E-08
Dimethylphenol, 2,4-	105-67-9	5.5E-03	4,500	1.2E-06		2.7E-03	6.1E-07	2.7E-03	6.1E-07
Di-n-butyl phthalate	84-74-2	8.8E-03	15,000	5.9E-07		4.4E-03	2.9E-07	4.4E-03	2.9E-07
Dinitrobenzene, 1,3-	99-65-0	4.6E-04	1,000	4.6E-07		2.3E-04	2.3E-07	2.3E-04	2.3E-07
Dinitrophenol, 2,4-	51-28-5	1.9E-02	220	8.7E-05		9.6E-03	4.4E-05	9.6E-03	4.4E-05
Dinitrotoluene, 2,4-	121-14-2	4.4E-04	600	7.3E-07		2.2E-04	3.6E-07	2.2E-04	3.6E-07
Dinitrotoluene, 2,6-	606-20-2	4.5E-04	600	7.5E-07		2.2E-04	3.7E-07	2.2E-04	3.7E-07
Di-n-octylphthalate	117-84-0	2.9E-03	6,800	4.3E-07		1.4E-03	2.1E-07	1.4E-03	2.1E-07
Dioxane, 1,4-	123-91-1	5.1E-04	3,000	1.7E-07		2.6E-04	8.5E-08	2.6E-04	8.5E-08
diphenylamine	122-39-4	4.4E-04	30,000	1.5E-08		2.2E-04	7.3E-09	2.2E-04	7.3E-09
Ethyl methacrylate	97-63-2	1.3E-03	13,000	9.8E-08		6.4E-04	4.9E-08	6.4E-04	4.9E-08
Ethylbenzene	100-41-4	8.8E-03	140,000	6.3E-08		4.4E-03	3.1E-08	4.4E-03	3.1E-08
Ethylene Dibromide	106-93-4	7.1E-04	130,000	5.5E-09		3.5E-04	2.7E-09	3.5E-04	2.7E-09
ethylether	60-29-7	2.0E-03	1,500,000	1.3E-09		1.0E-03	6.6E-10	1.0E-03	6.6E-10
Ethylhexyl phthalate, bis-2-	117-81-7	8.4E-04	10,000	8.4E-08		4.2E-04	4.2E-08	4.2E-04	4.2E-08
Fluoranthene	206-44-0	2.1E-03	1,500	1.4E-06		1.0E-03	7.0E-07	1.0E-03	7.0E-07
Fluorene	86-73-7	5.2E-04	6,600	7.9E-08		2.6E-04	3.9E-08	2.6E-04	3.9E-08
Formaldehyde	50-00-0	3.8E-02	55	6.8E-04		1.9E-02	3.4E-04	1.9E-02	3.4E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	2.1E-08	3	6.8E-09		1.0E-08	3.4E-09	1.0E-08	3.4E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	5.2E-07	45	1.2E-08		2.6E-07	5.7E-09	2.6E-07	5.7E-09

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.4E-07	60	2.3E-09		6.8E-08	1.1E-09	6.8E-08	1.1E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	2.5E-09	0.07	3.6E-08		1.2E-09	1.8E-08	1.2E-09	1.8E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	6.3E-09	0.75	8.4E-09		3.2E-09	4.2E-09	3.2E-09	4.2E-09
HexaCDD, 1,2,3,7,8,9-	19408-74-3	4.3E-09	4	1.1E-09		2.2E-09	5.4E-10	2.2E-09	5.4E-10
HexaCDF, 1,2,3,4,7,8-	70648-26-9	1.9E-07	0.07	2.6E-06		9.2E-08	1.3E-06	9.2E-08	1.3E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.1E-07	0.04	2.9E-06		5.7E-08	1.4E-06	5.7E-08	1.4E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	8.6E-08	30	2.9E-09		4.3E-08	1.4E-09	4.3E-08	1.4E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.4E-07	0.49	2.8E-07		6.8E-08	1.4E-07	6.8E-08	1.4E-07
Hexachloro-1,3-butadiene (Perchlorobutadiene)	87-68-3	6.5E-04	11,000	5.9E-08		3.2E-04	2.9E-08	3.2E-04	2.9E-08
Hexachlorobenzene	118-74-1	3.7E-03	6	6.2E-04		1.9E-03	3.1E-04	1.9E-03	3.1E-04
Hexachlorocyclopentadiene	77-47-4	8.8E-03	110	8.0E-05		4.4E-03	4.0E-05	4.4E-03	4.0E-05
Hexachloroethane (Perchloroethane)	67-72-1	4.7E-04	29,000	1.6E-08		2.4E-04	8.1E-09	2.4E-04	8.1E-09
hexachloropropene	1888-71-7	6.3E-04	905	7.0E-07		3.1E-04	3.5E-07	3.1E-04	3.5E-07
hexane	110-54-3	7.8E-03	1,100,000	7.1E-09		3.9E-03	3.6E-09	3.9E-03	3.6E-09
Hydrogen chloride	7647-01-0	1.4E+01	2,100	6.8E-03		7.1E+00	3.4E-03	7.1E+00	3.4E-03
Indeno(1,2,3-cd) pyrene	193-39-5	2.7E-04	15	1.8E-05		1.4E-04	9.0E-06	1.4E-04	9.0E-06
Isophorone	78-59-1	4.4E-04	23,000	1.9E-08		2.2E-04	9.5E-09	2.2E-04	9.5E-09
Lead	7439-92-1	2.8E-02	150	1.9E-04		1.4E-02	9.3E-05	1.4E-02	9.3E-05
manganese	7439-96-5	6.4E-02	3,000	2.1E-05		3.2E-02	1.1E-05	3.2E-02	1.1E-05
Mercuric chloride	7487-94-7	3.8E-06	2,700	1.4E-09		1.9E-06	7.0E-10	1.9E-06	7.0E-10
Methacrylonitrile	126-98-7	4.7E-03	2,700	1.7E-06		2.4E-03	8.7E-07	2.4E-03	8.7E-07
Methyl bromide (Bromomethane)	74-83-9	9.6E-05	74,000	1.3E-09		4.8E-05	6.5E-10	4.8E-05	6.5E-10
Methyl chloride (Chloromethane)	74-87-3	1.1E-02	210,000	5.3E-08		5.6E-03	2.7E-08	5.6E-03	2.7E-08
Methyl ethyl ketone (2-Butanone)	78-93-3	3.1E-03	13,000	2.4E-07		1.6E-03	1.2E-07	1.6E-03	1.2E-07
Methyl isobutyl ketone	108-10-1	6.5E-04	310,000	2.1E-09		3.3E-04	1.1E-09	3.3E-04	1.1E-09
methyl tert-butyl ether	1634-04-4	1.0E-02	180,000	5.8E-08		5.2E-03	2.9E-08	5.2E-03	2.9E-08
methylcyclohexane	108-87-2	9.6E-03	1,600,000	6.0E-09		4.8E-03	3.0E-09	4.8E-03	3.0E-09
Methylene chloride	75-09-2	1.9E-01	14,000	1.4E-05		9.6E-02	6.8E-06	9.6E-02	6.8E-06
methymethacrylate	80-62-6	1.3E-03	70,000	1.8E-08		6.4E-04	9.1E-09	6.4E-04	9.1E-09

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	7.3E-02	79,000	9.3E-07		3.7E-02	4.6E-07	3.7E-02	4.6E-07
Nickel	7440-02-0	3.9E-02	0.2	2.0E-01		2.0E-02	9.8E-02	3.4E-04	1.7E-03
Nitroaniline, 2-	88-74-4	4.4E-04	4,800	9.1E-08		2.2E-04	4.5E-08	2.2E-04	4.5E-08
Nitroaniline, 3-	99-09-2	1.7E-03	110	1.6E-05		8.7E-04	7.9E-06	8.7E-04	7.9E-06
Nitroaniline, 4-	100-01-6	1.7E-03	9,000	1.9E-07		8.7E-04	9.7E-08	8.7E-04	9.7E-08
Nitrobenzene	98-95-3	5.0E-04	9,100	5.5E-08		2.5E-04	2.7E-08	2.5E-04	2.7E-08
Nitrophenol, 2-	88-75-5	3.8E-03	1,000	3.8E-06		1.9E-03	1.9E-06	1.9E-03	1.9E-06
Nitrophenol, 4-	100-02-7	2.9E-03	1,200	2.4E-06		1.4E-03	1.2E-06	1.4E-03	1.2E-06
Nitroso-di-n-butylamine, n-	924-16-3	4.4E-04	2,000	2.2E-07		2.2E-04	1.1E-07	2.2E-04	1.1E-07
Nitrosodiphenylamine, N-	86-30-6	7.8E-05	1,400	5.6E-08		3.9E-05	2.8E-08	3.9E-05	2.8E-08
Nitrosodipropylamine, n-	621-64-7	4.4E-04	2,000	2.2E-07		2.2E-04	1.1E-07	2.2E-04	1.1E-07
n-nitrosodiethylamine	55-18-5	4.4E-04	1,700	2.6E-07		2.2E-04	1.3E-07	2.2E-04	1.3E-07
n-nitrosodimethylamine	62-75-9	4.5E-04	1,700	2.6E-07		2.2E-04	1.3E-07	2.2E-04	1.3E-07
n-nitrosomethylethylamine	10595-95-6	7.3E-04	1,700	4.3E-07		3.6E-04	2.1E-07	3.6E-04	2.1E-07
n-nitrosomorpholine	59-89-2	4.4E-04	74	5.9E-06		2.2E-04	3.0E-06	2.2E-04	3.0E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.6E-08	3	8.7E-09		1.3E-08	4.4E-09	1.3E-08	4.4E-09
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	3.8E-07	75	5.0E-09		1.9E-07	2.5E-09	1.9E-07	2.5E-09
o-tolualdehyde	529-20-4	3.2E-02	17,000	1.9E-06		1.6E-02	9.4E-07	1.6E-02	9.4E-07
p-dimethylaminoazobenzene	60-11-7	3.9E-04	670	5.8E-07		1.9E-04	2.9E-07	1.9E-04	2.9E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	4.8E-09	0.1	4.8E-08		2.4E-09	2.4E-08	2.4E-09	2.4E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	5.9E-08	0.24	2.4E-07		2.9E-08	1.2E-07	2.9E-08	1.2E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	1.2E-07	0.07	1.7E-06		5.8E-08	8.3E-07	5.8E-08	8.3E-07
Pentachlorobenzene	608-93-5	4.4E-04	1,600	2.7E-07		2.2E-04	1.4E-07	2.2E-04	1.4E-07
pentachloroethane	76-01-7	5.6E-04	320,000	1.7E-09		2.8E-04	8.7E-10	2.8E-04	8.7E-10
Pentachloronitrobenzene (PCNB)	82-68-8	4.6E-04	1,500	3.1E-07		2.3E-04	1.5E-07	2.3E-04	1.5E-07
Pentachlorophenol	87-86-5	2.2E-02	1,400	1.6E-05		1.1E-02	7.8E-06	1.1E-02	7.8E-06
perchlorate	14797-73-0	3.5E-04	23	1.5E-05		1.7E-04	7.5E-06	1.7E-04	7.5E-06
Phenanthrene	85-01-8	2.5E-03	760	3.3E-06		1.3E-03	1.7E-06	1.3E-03	1.7E-06
Phenol	108-95-2	2.4E-03	5,800	4.1E-07		1.2E-03	2.0E-07	1.2E-03	2.0E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
phosphorous	7723-14-0	7.5E-02	270	2.8E-04		3.7E-02	1.4E-04	3.7E-02	1.4E-04
propanal	123-38-6	4.2E-02	110,000	3.8E-07		2.1E-02	1.9E-07	2.1E-02	1.9E-07
propylbenzene	103-65-1	3.7E-03	5,400	6.8E-07		1.8E-03	3.4E-07	1.8E-03	3.4E-07
propylene	115-07-1	3.9E-02	860,000	4.6E-08		2.0E-02	2.3E-08	2.0E-02	2.3E-08
Pyrene	129-00-0	1.8E-03	150	1.2E-05		9.0E-04	6.0E-06	9.0E-04	6.0E-06
Pyridine	110-86-1	6.5E-04	9,700	6.7E-08		3.2E-04	3.3E-08	3.2E-04	3.3E-08
Selenium	7782-49-2	1.1E-03	200	5.4E-06		5.4E-04	2.7E-06	5.4E-04	2.7E-06
Silver	7440-22-4	8.2E-04	100	8.2E-06		4.1E-04	4.1E-06	4.1E-04	4.1E-06
Styrene	100-42-5	1.0E-03	21,000	4.9E-08		5.2E-04	2.5E-08	5.2E-04	2.5E-08
TetraCDD, 2,3,7,8-	1746-01-6	1.8E-09	0.00003	5.9E-05		8.8E-10	2.9E-05	8.8E-10	2.9E-05
TetraCDF, 2,3,7,8-	51207-31-9	3.1E-08	0.07	4.4E-07		1.6E-08	2.2E-07	1.6E-08	2.2E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	4.4E-04	240	1.8E-06		2.2E-04	9.1E-07	2.2E-04	9.1E-07
Tetrachloroethane, 1,1,2,2-	79-34-5	3.4E-04	7,000	4.8E-08		1.7E-04	2.4E-08	1.7E-04	2.4E-08
Tetrachloroethylene (Perchloroethylene)	127-18-4	2.0E-03	20,000	1.0E-07		1.0E-03	5.0E-08	1.0E-03	5.0E-08
Tetrachlorophenol, 2,3,4,6-	58-90-2	5.7E-04	1,300	4.4E-07		2.8E-04	2.2E-07	2.8E-04	2.2E-07
Tetrahydrofuran	109-99-9	7.2E-04	290,000	2.5E-09		3.6E-04	1.2E-09	3.6E-04	1.2E-09
Toluene	108-88-3	2.2E-02	37,000	6.0E-07		1.1E-02	3.0E-07	1.1E-02	3.0E-07
Toluidine, o-	95-53-4	5.6E-03	8,800	6.4E-07		2.8E-03	3.2E-07	2.8E-03	3.2E-07
trans-1,3-dichloropropene	10061-02-6	4.9E-04	75,000	6.5E-09		2.4E-04	3.2E-09	2.4E-04	3.2E-09
trans-2-butene	624-64-6	6.1E-03	1,000,000	6.1E-09		3.1E-03	3.1E-09	3.1E-03	3.1E-09
Trichlorobenzene, 1,2,4-	120-82-1	5.2E-04	3,400	1.5E-07		2.6E-04	7.6E-08	2.6E-04	7.6E-08
Trichloroethane, 1,1,1-	71-55-6	2.2E-04	1,300,000	1.7E-10		1.1E-04	8.3E-11	1.1E-04	8.3E-11
Trichloroethane, 1,1,2-	79-00-5	5.8E-04	81,000	7.2E-09		2.9E-04	3.6E-09	2.9E-04	3.6E-09
Trichloroethylene	79-01-6	7.5E-04	700,000	1.1E-09		3.7E-04	5.4E-10	3.7E-04	5.4E-10
Trichlorophenol, 2,4,5-	95-95-4	1.1E-03	7,400	1.5E-07		5.7E-04	7.6E-08	5.7E-04	7.6E-08
Trichlorophenol, 2,4,6-	88-06-2	1.0E-03	1,800	5.8E-07		5.2E-04	2.9E-07	5.2E-04	2.9E-07
Trimethylbenzene, 1,3,5-	108-67-8	1.5E-02	690,000	2.2E-08		7.6E-03	1.1E-08	7.6E-03	1.1E-08
Trinitrobenzene, 1,3,5 (sym-)	99-35-4	4.4E-04	530	8.3E-07		2.2E-04	4.1E-07	2.2E-04	4.1E-07
undecane	1120-21-4	9.6E-03	1,500	6.4E-06		4.8E-03	3.2E-06	4.8E-03	3.2E-06

Source M-136 A and M-225 A, Acute HQs and HI Howell Dairy, with adjustment for NI and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	6.1E-03	180,000	3.4E-08		3.0E-03	1.7E-08	3.0E-03	1.7E-08
Xylene, m-	108-38-3	8.8E-03	22,000	4.0E-07		4.4E-03	2.0E-07	4.4E-03	2.0E-07
Xylene, o-	95-47-6	1.0E-02	22,000	4.7E-07		5.2E-03	2.4E-07	5.2E-03	2.4E-07
Xylene, p-	106-42-3	8.8E-03	22,000	4.0E-07		4.4E-03	2.0E-07	4.4E-03	2.0E-07
Zinc	7440-66-6	3.8E-02	1,900	2.0E-05		1.9E-02	1.0E-05	1.9E-02	1.0E-05
			Total	**0.3**		**Total**	**0.1**	**With adjusted Ni & Cr**	**3.6E-02**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	2.3E-03	690,000	3.3E-09		1.1E-03	1.6E-09	1.1E-03	1.6E-09
1,2,4-Trimethylbenzene	95-63-6	1.3E-01	690,000	1.9E-07		6.7E-02	9.7E-08	6.7E-02	9.7E-08
1,4-Diethylbenzene	105-05-5	3.6E-03	12,000	3.0E-07		1.8E-03	1.5E-07	1.8E-03	1.5E-07
1-Butene	106-98-9	1.2E-01	1,200,000	9.8E-08		5.9E-02	4.9E-08	5.9E-02	4.9E-08
1-Chloronapthalene	90-13-1	2.9E-03	4,600	6.4E-07		1.5E-03	3.2E-07	1.5E-03	3.2E-07
1-Naphthylamine	134-32-7	5.9E-02	210	2.8E-04		2.9E-02	1.4E-04	2.9E-02	1.4E-04
2,2,4-Trimethylpentane	540-84-1	1.3E-01	14,000,000	9.2E-09		6.4E-02	4.6E-09	6.4E-02	4.6E-09
2,2-Dimethylbutane	75-83-2	7.5E-03	1,800,000	4.2E-09		3.7E-03	2.1E-09	3.7E-03	2.1E-09
2,3,4-Trimethylpentane	565-75-3	4.4E-02	14,000,000	3.1E-09		2.2E-02	1.6E-09	2.2E-02	1.6E-09
2,3-Dimethylbutane	79-29-8	1.9E-02	1,800,000	1.0E-08		9.4E-03	5.2E-09	9.4E-03	5.2E-09
2,3-Dimethylpentane	565-59-3	7.5E-02	1,800,000	4.2E-08		3.7E-02	2.1E-08	3.7E-02	2.1E-08
2,4-Dimethylpentane	108-08-7	2.8E-02	180,000	1.5E-07		1.4E-02	7.7E-08	1.4E-02	7.7E-08
2,5-Dimethylbenzaldehyde	5779-94-2	1.4E-01	17,000	8.5E-06		7.2E-02	4.2E-06	7.2E-02	4.2E-06
2,6-Dichlorophenol	87-65-0	2.9E-03	8,800	3.3E-07		1.5E-03	1.7E-07	1.5E-03	1.7E-07
2-Ethyltoluene	611-14-3	2.4E-03	12,000	2.0E-07		1.2E-03	1.0E-07	1.2E-03	1.0E-07
2-Hexanone	591-78-6	1.1E-02	41,000	2.6E-07		5.3E-03	1.3E-07	5.3E-03	1.3E-07
2-Methylhexane	591-76-4	9.1E-02	1,800,000	5.1E-08		4.5E-02	2.5E-08	4.5E-02	2.5E-08
2-Methylnaphthalene	91-57-6	4.0E-02	3,000	1.3E-05		2.0E-02	6.7E-06	2.0E-02	6.7E-06
2-Methylpentane	107-83-5	5.9E-02	1,800,000	3.3E-08		2.9E-02	1.6E-08	2.9E-02	1.6E-08
2-Naphthylamine	91-59-8	5.9E-02	320	1.8E-04		2.9E-02	9.2E-05	2.9E-02	9.2E-05
3-Ethyltoluene	620-14-4	2.6E-02	12,000	2.1E-06		1.3E-02	1.1E-06	1.3E-02	1.1E-06
3-Methylheptane	589-81-1	1.9E-02	1,400,000	1.3E-08		9.4E-03	6.7E-09	9.4E-03	6.7E-09
3-Methylhexane	589-34-4	1.2E-01	1,800,000	6.5E-08		5.9E-02	3.3E-08	5.9E-02	3.3E-08
3-Methylpentane	96-14-0	3.8E-02	1,800,000	2.1E-08		1.9E-02	1.1E-08	1.9E-02	1.1E-08
4,6-Dinitro-2-methylphenol	534-52-1	5.1E-02	200	2.6E-04		2.5E-02	1.3E-04	2.5E-02	1.3E-04
4-Aminobyphenyl	92-67-1	5.9E-02	490	1.2E-04		2.9E-02	6.0E-05	2.9E-02	6.0E-05
4-Ethyltoluene	622-96-8	2.8E-02	12,000	2.4E-06		1.4E-02	1.2E-06	1.4E-02	1.2E-06
Acenaphthene	83-32-9	2.9E-03	3,600	8.2E-07		1.5E-03	4.1E-07	1.5E-03	4.1E-07
Acenaphthylene	208-96-8	1.7E-02	10,000	1.7E-06		8.2E-03	8.2E-07	8.2E-03	8.2E-07

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	5.0E-01	470	1.1E-03		2.5E-01	5.3E-04	2.5E-01	5.3E-04
Acetone	67-64-1	1.3E-01	470,000	2.7E-07		6.4E-02	1.4E-07	6.4E-02	1.4E-07
Acetonitrile	75-05-8	1.0E-01	22,000	4.6E-06		5.1E-02	2.3E-06	5.1E-02	2.3E-06
Acetophenone	98-86-2	1.4E-02	10,000	1.4E-06		7.2E-03	7.2E-07	7.2E-03	7.2E-07
Acrylonitrile	107-13-1	8.6E-02	10,000	8.6E-06		4.3E-02	4.3E-06	4.3E-02	4.3E-06
Aluminum	7429-90-5	2.1E+02	3,000	7.0E-02		1.0E+02	3.5E-02	1.0E+02	3.5E-02
Aniline	62-53-3	4.3E-02	30,000	1.4E-06		2.1E-02	7.1E-07	2.1E-02	7.1E-07
Anthracene	120-12-7	7.0E-04	270	2.6E-06		3.5E-04	1.3E-06	3.5E-04	1.3E-06
Antimony	7440-36-0	1.6E-01	500	3.1E-04		7.8E-02	1.6E-04	7.8E-02	1.6E-04
Arsenic	7440-38-2	2.9E-03	0.2	1.4E-02		1.4E-03	7.2E-03	1.4E-03	7.2E-03
Barium	7440-39-3	2.0E-03	1,500	1.4E-06		1.0E-03	6.8E-07	1.0E-03	6.8E-07
Benzaldehyde	100-52-7	2.0E-01	17,000	1.2E-05		1.0E-01	6.0E-06	1.0E-01	6.0E-06
Benzene	71-43-2	6.4E-01	27	2.4E-02		3.2E-01	1.2E-02	3.2E-01	1.2E-02
Benzo(a)anthracene	56-55-3	3.1E-03	1,200	2.6E-06		1.6E-03	1.3E-06	1.6E-03	1.3E-06
Benzo(a)pyrene	50-32-8	4.1E-04	600	6.8E-07		2.0E-04	3.4E-07	2.0E-04	3.4E-07
Benzo(b)fluoranthene	205-99-2	6.2E-03	31	2.0E-04		3.1E-03	9.9E-05	3.1E-03	9.9E-05
Benzo(g,h,i)perylene	191-24-2	2.4E-03	30,000	7.9E-08		1.2E-03	4.0E-08	1.2E-03	4.0E-08
Benzo(k)fluoranthene	207-08-9	6.1E-03	19	3.2E-04		3.1E-03	1.6E-04	3.1E-03	1.6E-04
Benzoic acid	65-85-0	3.3E-01	2,800	1.2E-04		1.7E-01	6.0E-05	1.7E-01	6.0E-05
Benzyl alcohol	100-51-6	4.2E-03	130,000	3.2E-08		2.1E-03	1.6E-08	2.1E-03	1.6E-08
Benzyl chloride	100-44-7	3.1E-03	240	1.3E-05		1.5E-03	6.4E-06	1.5E-03	6.4E-06
Bis(2-chlorethyl)ether	111-44-4	3.3E-03	58,000	5.7E-08		1.6E-03	2.8E-08	1.6E-03	2.8E-08
Bis(2-chloroethoxy)methane	111-91-1	2.9E-03	920	3.2E-06		1.5E-03	1.6E-06	1.5E-03	1.6E-06
Bromodichloromethane	75-27-4	4.2E-03	260	1.6E-05		2.1E-03	8.0E-06	2.1E-03	8.0E-06
Bromoform	75-25-2	7.0E-03	15,000	4.6E-07		3.5E-03	2.3E-07	3.5E-03	2.3E-07
Bromophenyl-phenylether, 4-	101-55-3	2.9E-03	290	1.0E-05		1.5E-03	5.1E-06	1.5E-03	5.1E-06
Butylbenzylphthalate	85-68-7	8.0E-04	15,000	5.4E-08		4.0E-04	2.7E-08	4.0E-04	2.7E-08
Cadmium	7440-43-9	2.5E-04	100	2.5E-06		1.2E-04	1.2E-06	1.2E-04	1.2E-06
Carbazole	86-74-8	3.8E-03	660	5.7E-06		1.9E-03	2.8E-06	1.9E-03	2.8E-06

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	5.3E-02	6,200	8.5E-06		2.6E-02	4.2E-06	2.6E-02	4.2E-06
Carbon tetrachloride	56-23-5	8.0E-02	1,900	4.2E-05		4.0E-02	2.1E-05	4.0E-02	2.1E-05
Chlorine	7782-50-5	6.3E+01	210	3.0E-01		3.2E+01	1.5E-01	3.2E+01	1.5E-01
Chloro-3-methylphenol, 4-	59-50-7	3.6E-03	5,500	6.6E-07		1.8E-03	3.3E-07	1.8E-03	3.3E-07
Chloroacetonitrile	107-14-2	5.9E-03	9,000	6.5E-07		2.9E-03	3.3E-07	2.9E-03	3.3E-07
Chloroaniline, p-	106-47-8	8.3E-04	2,200	3.8E-07		4.1E-04	1.9E-07	4.1E-04	1.9E-07
Chlorobenzene	108-90-7	1.3E-02	46,000	2.9E-07		6.7E-03	1.5E-07	6.7E-03	1.5E-07
Chloroethane	75-00-3	2.4E-03	260,000	9.1E-09		1.2E-03	4.5E-09	1.2E-03	4.5E-09
Chloroform (Trichloromethane)	67-66-3	3.3E-02	150	2.2E-04		1.6E-02	1.1E-04	1.6E-02	1.1E-04
Chloronaphthalene,2-	91-58-7	2.9E-03	600	4.9E-06		1.5E-03	2.4E-06	1.5E-03	2.4E-06
Chlorophenol, 2-	95-57-8	1.0E-02	1,300	7.9E-06		5.1E-03	3.9E-06	5.1E-03	3.9E-06
Chromium III	7440-47-3	5.8E-02	1,500	3.8E-05		2.9E-02	1.9E-05	1.4E-03	9.6E-07
Chromium, hexavalent	18540-29-9	4.7E-02	89	5.3E-04		2.4E-02	2.6E-04	1.2E-03	1.3E-05
Chrysene	218-01-9	3.9E-03	600	6.4E-06		1.9E-03	3.2E-06	1.9E-03	3.2E-06
Cis-1,3-dichloropropene	10062-01-5	7.0E-03	600	1.2E-05		3.5E-03	5.8E-06	3.5E-03	5.8E-06
cis-2-Butene	590-18-1	9.1E-03	150,000,000	6.1E-11		4.5E-03	3.0E-11	4.5E-03	3.0E-11
Cobalt	7440-48-4	6.3E-04	180	3.5E-06		3.1E-04	1.7E-06	3.1E-04	1.7E-06
Copper	7440-50-8	1.3E-01	100	1.3E-03		6.5E-02	6.5E-04	6.5E-02	6.5E-04
Cresol, m-	108-39-4	6.9E-04	20,000	3.4E-08		3.4E-04	1.7E-08	3.4E-04	1.7E-08
Cresol, o-	95-48-7	1.8E-02	20,000	8.8E-07		8.8E-03	4.4E-07	8.8E-03	4.4E-07
Cresol, p-	106-44-5	6.9E-04	20,000	3.4E-08		3.4E-04	1.7E-08	3.4E-04	1.7E-08
Crotonaldehyde	4170-30-3	1.7E-02	540	3.2E-05		8.6E-03	1.6E-05	8.6E-03	1.6E-05
Cumene	98-82-8	2.3E-03	250,000	9.0E-09		1.1E-03	4.5E-09	1.1E-03	4.5E-09
Cyclohexane	110-82-7	1.3E-02	340,000	3.9E-08		6.7E-03	2.0E-08	6.7E-03	2.0E-08
Dibenz(a,h)anthracene	53-70-3	5.4E-04	34	1.6E-05		2.7E-04	8.0E-06	2.7E-04	8.0E-06
Dibenzofuran	132-64-9	2.9E-03	30,000	9.8E-08		1.5E-03	4.9E-08	1.5E-03	4.9E-08
Dibromochloromethane	124-48-1	4.7E-03	7,400	6.4E-07		2.4E-03	3.2E-07	2.4E-03	3.2E-07
Dichlorobenzene, 1,2-	95-50-1	3.0E-03	300,000	1.0E-08		1.5E-03	5.0E-09	1.5E-03	5.0E-09
Dichlorobenzene, 1,3-	541-73-1	3.3E-03	16,000	2.1E-07		1.7E-03	1.0E-07	1.7E-03	1.0E-07

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	3.1E-03	60,000	5.2E-08		1.6E-03	2.6E-08	1.6E-03	2.6E-08
Dichloroethane 1,1-	75-34-3	1.7E-03	650,000	2.6E-09		8.6E-04	1.3E-09	8.6E-04	1.3E-09
Dichloroethane, 1,2	107-06-2	2.9E-03	200,000	1.4E-08		1.4E-03	7.2E-09	1.4E-03	7.2E-09
Dichloroethylene 1,1-	75-35-4	2.3E-03	180,000	1.3E-08		1.1E-03	6.4E-09	1.1E-03	6.4E-09
Dichloroethylene, cis-1,2-	156-59-2	6.4E-04	560,000	1.1E-09		3.2E-04	5.7E-10	3.2E-04	5.7E-10
Dichloroethylene-1,2 (trans)	156-60-5	3.9E-03	1,100,000	3.5E-09		1.9E-03	1.8E-09	1.9E-03	1.8E-09
Dichlorophenol, 2,4-	120-83-2	5.0E-03	1,300	3.8E-06		2.5E-03	1.9E-06	2.5E-03	1.9E-06
Dichloropropane, 1,2-	78-87-5	2.0E-03	140,000	1.4E-08		9.9E-04	7.1E-09	9.9E-04	7.1E-09
Diethyl phthalate	84-66-2	4.3E-03	5,000	8.6E-07		2.1E-03	4.3E-07	2.1E-03	4.3E-07
Dimethyl phthalate	131-11-3	2.9E-03	15,000	2.0E-07		1.5E-03	9.8E-08	1.5E-03	9.8E-08
Dimethylphenol, 2,4-	105-67-9	3.7E-02	4,500	8.2E-06		1.8E-02	4.1E-06	1.8E-02	4.1E-06
Di-n-butyl phthalate	84-74-2	5.9E-02	15,000	3.9E-06		2.9E-02	2.0E-06	2.9E-02	2.0E-06
Dinitrobenzene, 1,3-	99-65-0	3.1E-03	1,000	3.1E-06		1.5E-03	1.5E-06	1.5E-03	1.5E-06
Dinitrophenol, 2,4-	51-28-5	1.3E-01	220	5.9E-04		6.4E-02	2.9E-04	6.4E-02	2.9E-04
Dinitrotoluene, 2,4-	121-14-2	2.9E-03	600	4.9E-06		1.5E-03	2.4E-06	1.5E-03	2.4E-06
Dinitrotoluene, 2,6-	606-20-2	3.0E-03	600	5.0E-06		1.5E-03	2.5E-06	1.5E-03	2.5E-06
Di-n-octylphthalate	117-84-0	2.0E-02	6,800	2.9E-06		9.9E-03	1.5E-06	9.9E-03	1.5E-06
Dioxane, 1,4-	123-91-1	3.4E-03	3,000	1.1E-06		1.7E-03	5.7E-07	1.7E-03	5.7E-07
Diphenylamine	122-39-4	2.9E-03	30,000	9.8E-08		1.5E-03	4.9E-08	1.5E-03	4.9E-08
Ethyl methacrylate	97-63-2	8.6E-03	13,000	6.6E-07		4.3E-03	3.3E-07	4.3E-03	3.3E-07
Ethylbenzene	100-41-4	5.9E-02	140,000	4.2E-07		2.9E-02	2.1E-07	2.9E-02	2.1E-07
Ethylene Dibromide	106-93-4	4.8E-03	130,000	3.7E-08		2.4E-03	1.8E-08	2.4E-03	1.8E-08
Ethylether	60-29-7	1.3E-02	1,500,000	8.9E-09		6.7E-03	4.5E-09	6.7E-03	4.5E-09
Ethylhexyl phthalate, bis-2-	117-81-7	6.2E-03	10,000	6.2E-07		3.1E-03	3.1E-07	3.1E-03	3.1E-07
Fluoranthene	206-44-0	1.4E-02	1,500	9.4E-06		7.0E-03	4.7E-06	7.0E-03	4.7E-06
Fluorene	86-73-7	3.5E-03	6,600	5.3E-07		1.7E-03	2.6E-07	1.7E-03	2.6E-07
Formaldehyde	50-00-0	2.5E-01	55	4.6E-03		1.3E-01	2.3E-03	1.3E-01	2.3E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	1.5E-07	3	5.1E-08		7.7E-08	2.6E-08	7.7E-08	2.6E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	3.9E-06	45	8.6E-08		1.9E-06	4.3E-08	1.9E-06	4.3E-08

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.0E-06	60	1.7E-08		5.0E-07	8.4E-09	5.0E-07	8.4E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	1.9E-08	0.074	2.5E-07		9.3E-09	1.3E-07	9.3E-09	1.3E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	4.7E-08	0.75	6.3E-08		2.4E-08	3.1E-08	2.4E-08	3.1E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	3.2E-08	3.9	8.3E-09		1.6E-08	4.1E-09	1.6E-08	4.1E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	1.4E-06	0.074	1.9E-05		6.9E-07	9.3E-06	6.9E-07	9.3E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	8.5E-07	0.037	2.3E-05		4.2E-07	1.1E-05	4.2E-07	1.1E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	6.4E-07	30	2.1E-08		3.2E-07	1.1E-08	3.2E-07	1.1E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.0E-06	0.49	2.1E-06		5.0E-07	1.0E-06	5.0E-07	1.0E-06
Hexachloro-1,3-butadiene	87-68-3	4.3E-03	11,000	4.0E-07		2.2E-03	2.0E-07	2.2E-03	2.0E-07
Hexachlorobenzene	118-74-1	2.5E-02	6	4.2E-03		1.2E-02	2.1E-03	1.2E-02	2.1E-03
Hexachlorocyclopentadiene	77-47-4	5.9E-02	110	5.4E-04		2.9E-02	2.7E-04	2.9E-02	2.7E-04
Hexachloroethane (Perchloroethane)	67-72-1	3.2E-03	29,000	1.1E-07		1.6E-03	5.4E-08	1.6E-03	5.4E-08
Hexachloropropene	1888-71-7	4.2E-03	905	4.7E-06		2.1E-03	2.3E-06	2.1E-03	2.3E-06
Hexane	110-54-3	5.3E-02	1,100,000	4.8E-08		2.6E-02	2.4E-08	2.6E-02	2.4E-08
Hydrogen chloride	7647-01-0	9.5E+01	2,100	4.5E-02		4.8E+01	2.3E-02	4.8E+01	2.3E-02
Indeno(1,2,3-cd) pyrene	193-39-5	2.1E-03	15	1.4E-04		1.0E-03	6.9E-05	1.0E-03	6.9E-05
Isophorone	78-59-1	2.9E-03	23,000	1.3E-07		1.5E-03	6.4E-08	1.5E-03	6.4E-08
Lead	7439-92-1	2.1E-01	150	1.4E-03		1.1E-01	7.1E-04	1.1E-01	7.1E-04
Manganese	7439-96-5	4.9E-01	3,000	1.6E-04		2.5E-01	8.2E-05	2.5E-01	8.2E-05
Mercuric chloride	7487-94-7	2.8E-05	2,700	1.0E-08		1.4E-05	5.2E-09	1.4E-05	5.2E-09
Methacrylonitrile	126-98-7	3.2E-02	2,700	1.2E-05		1.6E-02	5.8E-06	1.6E-02	5.8E-06
Methyl bromide	74-83-9	6.4E-04	3,900	1.6E-07		3.2E-04	8.2E-08	3.2E-04	8.2E-08
Methyl chloride	74-87-3	7.5E-02	210,000	3.6E-07		3.7E-02	1.8E-07	3.7E-02	1.8E-07
Methyl ethyl ketone	78-93-3	2.1E-02	13,000	1.6E-06		1.0E-02	8.0E-07	1.0E-02	8.0E-07
Methyl isobutyl ketone	108-10-1	4.4E-03	310,000	1.4E-08		2.2E-03	7.1E-09	2.2E-03	7.1E-09
Methyl tert-butyl ether	1634-04-4	7.0E-02	180,000	3.9E-07		3.5E-02	1.9E-07	3.5E-02	1.9E-07
Methylcyclohexane	108-87-2	6.4E-02	1,600,000	4.0E-08		3.2E-02	2.0E-08	3.2E-02	2.0E-08
Methylene chloride	75-09-2	1.3E+00	14,000	9.2E-05		6.4E-01	4.6E-05	6.4E-01	4.6E-05
Methylmethacrylate	80-62-6	8.6E-03	70,000	1.2E-07		4.3E-03	6.1E-08	4.3E-03	6.1E-08

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	4.9E-01	79,000	6.2E-06		2.4E-01	3.1E-06	2.4E-01	3.1E-06
Nickel	7440-02-0	3.0E-01	0.2	1.5E+00		1.5E-01	7.6E-01	2.6E-03	1.3E-02
Nitroaniline, 2-	88-74-4	2.9E-03	4,800	6.1E-07		1.5E-03	3.1E-07	1.5E-03	3.1E-07
Nitroaniline, 3-	99-09-2	1.2E-02	110	1.1E-04		5.9E-03	5.3E-05	5.9E-03	5.3E-05
Nitroaniline, 4-	100-01-6	1.2E-02	9,000	1.3E-06		5.9E-03	6.5E-07	5.9E-03	6.5E-07
Nitrobenzene	98-95-3	3.3E-03	9,100	3.7E-07		1.7E-03	1.8E-07	1.7E-03	1.8E-07
Nitrophenol, 2-	88-75-5	2.5E-02	1,000	2.5E-05		1.3E-02	1.3E-05	1.3E-02	1.3E-05
Nitrophenol, 4-	100-02-7	1.9E-02	1,200	1.6E-05		9.7E-03	8.0E-06	9.7E-03	8.0E-06
Nitroso-di-n-butylamine, n-	924-16-3	2.9E-03	2,000	1.5E-06		1.5E-03	7.3E-07	1.5E-03	7.3E-07
Nitrosodiphenylamine, N-	86-30-6	5.2E-04	1,400	3.7E-07		2.6E-04	1.9E-07	2.6E-04	1.9E-07
Nitrosodipropylamine, n-	621-64-7	2.9E-03	2,000	1.5E-06		1.5E-03	7.3E-07	1.5E-03	7.3E-07
n-Nitrosodiethylamine	55-18-5	2.9E-03	1,700	1.7E-06		1.5E-03	8.6E-07	1.5E-03	8.6E-07
n-Nitrosodimethylamine	62-75-9	3.0E-03	1,700	1.8E-06		1.5E-03	8.8E-07	1.5E-03	8.8E-07
n-Nitrosomethylethylamine	10595-95-6	4.9E-03	1,700	2.9E-06		2.4E-03	1.4E-06	2.4E-03	1.4E-06
n-Nitrosomorpholine	59-89-2	2.9E-03	74	4.0E-05		1.5E-03	2.0E-05	1.5E-03	2.0E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.0E-07	3	6.6E-08		9.8E-08	3.3E-08	9.8E-08	3.3E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	2.8E-06	75	3.8E-08		1.4E-06	1.9E-08	1.4E-06	1.9E-08
o-Tolualdehyde	529-20-4	2.1E-01	17,000	1.3E-05		1.1E-01	6.3E-06	1.1E-01	6.3E-06
p-Dimethylaminoazobenzene	60-11-7	2.9E-03	670	4.3E-06		1.5E-03	2.2E-06	1.5E-03	2.2E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	3.6E-08	0.1	3.6E-07		1.8E-08	1.8E-07	1.8E-08	1.8E-07
PentaCDF, 1,2,3,7,8-	57117-41-6	4.3E-07	0.24	1.8E-06		2.1E-07	8.9E-07	2.1E-07	8.9E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	8.5E-07	0.074	1.2E-05		4.2E-07	5.7E-06	4.2E-07	5.7E-06
Pentachlorobenzene	608-93-5	2.9E-03	1,600	1.8E-06		1.5E-03	9.2E-07	1.5E-03	9.2E-07
Pentachloroethane	76-01-7	3.7E-03	320,000	1.2E-08		1.9E-03	5.8E-09	1.9E-03	5.8E-09
Pentachloronitrobenzene	82-68-8	3.1E-03	1,500	2.1E-06		1.6E-03	1.0E-06	1.6E-03	1.0E-06
Pentachlorophenol	87-86-5	1.5E-01	1,400	1.0E-04		7.3E-02	5.2E-05	7.3E-02	5.2E-05
Perchlorate	14797-73-0	2.6E-03	23	1.1E-04		1.3E-03	5.6E-05	1.3E-03	5.6E-05
Phenanthrene	85-01-8	1.7E-02	760	2.2E-05		8.5E-03	1.1E-05	8.5E-03	1.1E-05
Phenol	108-95-2	1.6E-02	5,800	2.8E-06		8.0E-03	1.4E-06	8.0E-03	1.4E-06

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	5.8E-01	270	2.1E-03		2.9E-01	1.1E-03	2.9E-01	1.1E-03
Propanal	123-38-6	2.8E-01	110,000	2.5E-06		1.4E-01	1.3E-06	1.4E-01	1.3E-06
Propylbenzene	103-65-1	2.5E-02	5,400	4.6E-06		1.2E-02	2.3E-06	1.2E-02	2.3E-06
Propylene	115-07-1	2.6E-01	860,000	3.1E-07		1.3E-01	1.5E-07	1.3E-01	1.5E-07
Pyrene	129-00-0	1.2E-02	150	8.0E-05		6.0E-03	4.0E-05	6.0E-03	4.0E-05
Pyridine	110-86-1	4.3E-03	9,700	4.5E-07		2.2E-03	2.2E-07	2.2E-03	2.2E-07
Selenium	7782-49-2	8.4E-03	200	4.2E-05		4.2E-03	2.1E-05	4.2E-03	2.1E-05
Silver	7440-22-4	6.3E-03	100	6.3E-05		3.1E-03	3.1E-05	3.1E-03	3.1E-05
Styrene	100-42-5	7.0E-03	21,000	3.3E-07		3.5E-03	1.7E-07	3.5E-03	1.7E-07
TetraCDD, 2,3,7,8-	1746-01-6	1.2E-08	0.00003	4.1E-04		6.1E-09	2.0E-04	6.1E-09	2.0E-04
TetraCDF, 2,3,7,8-	51207-31-9	2.1E-07	0.074	2.9E-06		1.1E-07	1.4E-06	1.1E-07	1.4E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.9E-03	240	1.2E-05		1.5E-03	6.1E-06	1.5E-03	6.1E-06
Tetrachloroethane, 1,1,2,2-	79-34-5	2.3E-03	7,000	3.2E-07		1.1E-03	1.6E-07	1.1E-03	1.6E-07
Tetrachloroethylene	127-18-4	1.3E-02	20,000	6.7E-07		6.7E-03	3.3E-07	6.7E-03	3.3E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	3.8E-03	1,300	2.9E-06		1.9E-03	1.5E-06	1.9E-03	1.5E-06
Tetrahydrofuran	109-99-9	4.8E-03	290,000	1.7E-08		2.4E-03	8.3E-09	2.4E-03	8.3E-09
Toluene	108-88-3	1.5E-01	37,000	4.1E-06		7.5E-02	2.0E-06	7.5E-02	2.0E-06
Toluidine, o-	95-53-4	3.8E-02	8,800	4.3E-06		1.9E-02	2.1E-06	1.9E-02	2.1E-06
Trans-1,3-dichloropropene	10061-02-6	3.3E-03	75,000	4.4E-08		1.6E-03	2.2E-08	1.6E-03	2.2E-08
trans-2-Butene	624-64-6	4.1E-02	1,000,000	4.1E-08		2.1E-02	2.1E-08	2.1E-02	2.1E-08
Trichlorobenzene, 1,2,4-	120-82-1	3.5E-03	3,400	1.0E-06		1.7E-03	5.1E-07	1.7E-03	5.1E-07
Trichloroethane, 1,1,1-	71-55-6	1.4E-03	1,300,000	1.1E-09		7.2E-04	5.6E-10	7.2E-04	5.6E-10
Trichloroethane, 1,1,2-	79-00-5	3.9E-03	81,000	4.8E-08		2.0E-03	2.4E-08	2.0E-03	2.4E-08
Trichloroethylene	79-01-6	5.0E-03	700,000	7.2E-09		2.5E-03	3.6E-09	2.5E-03	3.6E-09
Trichlorophenol, 2,4,5-	95-95-4	7.6E-03	7,400	1.0E-06		3.8E-03	5.1E-07	3.8E-03	5.1E-07
Trichlorophenol, 2,4,6-	88-06-2	7.0E-03	1,800	3.9E-06		3.5E-03	1.9E-06	3.5E-03	1.9E-06
Trimethylbenzene, 1,3,5-	108-67-8	1.0E-01	690,000	1.5E-07		5.1E-02	7.4E-08	5.1E-02	7.4E-08
Trinitrobenzene, 1,3,5	99-35-4	2.9E-03	530	5.5E-06		1.5E-03	2.8E-06	1.5E-03	2.8E-06
Undecane	1120-21-4	6.4E-02	1,500	4.3E-05		3.2E-02	2.1E-05	3.2E-02	2.1E-05

Source M-136 A and M-225 A, Acute HQs and HI North Plant Main Admin, with Adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)1	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	4.1E-02	180,000	2.3E-07		2.0E-02	1.1E-07	2.0E-02	1.1E-07
Xylene, m-	108-38-3	5.9E-02	22,000	2.7E-06		2.9E-02	1.3E-06	2.9E-02	1.3E-06
Xylene, o-	95-47-6	7.0E-02	22,000	3.2E-06		3.5E-02	1.6E-06	3.5E-02	1.6E-06
Xylene, p-	106-42-3	5.9E-02	22,000	2.7E-06		2.9E-02	1.3E-06	2.9E-02	1.3E-06
Zinc	7440-66-6	2.9E-01	1,900	1.5E-04		1.5E-01	7.7E-05	1.5E-01	7.7E-05
Chromium adjustment factor	**0.05**		**Total**	**2.0**		**Total**	**1.0**	**With adjusted Ni & Cr**	**0.2**
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	3.1E-04	690,000	4.5E-10		1.6E-04	2.3E-10	1.6E-04	2.3E-10
1,2,4-Trimethylbenzene	95-63-6	1.9E-02	690,000	2.7E-08		9.2E-03	1.3E-08	9.2E-03	1.3E-08
1,4-Diethylbenzene	105-05-5	5.0E-04	12,000	4.1E-08		2.5E-04	2.1E-08	2.5E-04	2.1E-08
1-butene	106-98-9	1.6E-02	1,200,000	1.4E-08		8.1E-03	6.8E-09	8.1E-03	6.8E-09
1-chloronapthalene	90-13-1	4.1E-04	4,600	8.8E-08		2.0E-04	4.4E-08	2.0E-04	4.4E-08
1-Naphthylamine	134-32-7	8.1E-03	210	3.9E-05		4.1E-03	1.9E-05	4.1E-03	1.9E-05
2,2,4-trimethylpentane	540-84-1	1.8E-02	14,000,000	1.3E-09		8.9E-03	6.3E-10	8.9E-03	6.3E-10
2,2-dimethylbutane	75-83-2	1.0E-03	1,800,000	5.8E-10		5.2E-04	2.9E-10	5.2E-04	2.9E-10
2,3,4-trimethylpentane	565-75-3	6.1E-03	14,000,000	4.3E-10		3.0E-03	2.2E-10	3.0E-03	2.2E-10
2,3-dimethylbutane	79-29-8	2.6E-03	1,800,000	1.4E-09		1.3E-03	7.2E-10	1.3E-03	7.2E-10
2,3-dimethylpentane	565-59-3	1.0E-02	1,800,000	5.8E-09		5.2E-03	2.9E-09	5.2E-03	2.9E-09
2,4-dimethylpentane	108-08-7	3.9E-03	180,000	2.1E-08		1.9E-03	1.1E-08	1.9E-03	1.1E-08
2,5-dimethylbenzaldehyde	5779-94-2	2.0E-02	17,000	1.2E-06		1.0E-02	5.9E-07	1.0E-02	5.9E-07
2,6-dichlorophenol	87-65-0	4.1E-04	8,800	4.6E-08		2.0E-04	2.3E-08	2.0E-04	2.3E-08
2-ethyltoluene	611-14-3	3.3E-04	12,000	2.8E-08		1.7E-04	1.4E-08	1.7E-04	1.4E-08
2-hexanone	591-78-6	1.5E-03	41,000	3.6E-08		7.4E-04	1.8E-08	7.4E-04	1.8E-08
2-methylhexane	591-76-4	1.3E-02	1,800,000	7.0E-09		6.3E-03	3.5E-09	6.3E-03	3.5E-09
2-methylnaphthalene	91-57-6	5.5E-03	3,000	1.8E-06		2.8E-03	9.2E-07	2.8E-03	9.2E-07
2-methylpentane	107-83-5	8.1E-03	1,800,000	4.5E-09		4.1E-03	2.3E-09	4.1E-03	2.3E-09
2-naphthylamine	91-59-8	8.0E-03	320	2.5E-05		4.0E-03	1.3E-05	4.0E-03	1.3E-05
3-ethyltoluene	620-14-4	3.6E-03	12,000	3.0E-07		1.8E-03	1.5E-07	1.8E-03	1.5E-07
3-methylheptane	589-81-1	2.6E-03	1,400,000	1.9E-09		1.3E-03	9.2E-10	1.3E-03	9.2E-10
3-methylhexane	589-34-4	1.6E-02	1,800,000	9.1E-09		8.1E-03	4.5E-09	8.1E-03	4.5E-09
3-methylpentane	96-14-0	5.3E-03	1,800,000	2.9E-09		2.6E-03	1.5E-09	2.6E-03	1.5E-09
4,6-dinitro-2-methylphenol	534-52-1	7.1E-03	200	3.5E-05		3.5E-03	1.8E-05	3.5E-03	1.8E-05
4-aminobyphenyl	92-67-1	8.1E-03	490	1.7E-05		4.1E-03	8.3E-06	4.1E-03	8.3E-06
4-ethyltoluene	622-96-8	3.9E-03	12,000	3.3E-07		2.0E-03	1.6E-07	2.0E-03	1.6E-07
Acenaphthene	83-32-9	4.1E-04	3,600	1.1E-07		2.0E-04	5.6E-08	2.0E-04	5.6E-08
acenaphthylene	208-96-8	2.3E-03	10,000	2.3E-07		1.1E-03	1.1E-07	1.1E-03	1.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	6.9E-02	470	1.5E-04		3.4E-02	7.3E-05	3.4E-02	7.3E-05
Acetone	67-64-1	1.8E-02	470,000	3.8E-08		8.9E-03	1.9E-08	8.9E-03	1.9E-08
Acetonitrile	75-05-8	1.4E-02	22,000	6.4E-07		7.0E-03	3.2E-07	7.0E-03	3.2E-07
Acetophenone	98-86-2	2.0E-03	10,000	2.0E-07		9.9E-04	9.9E-08	9.9E-04	9.9E-08
Acrylonitrile	107-13-1	1.2E-02	10,000	1.2E-06		5.9E-03	5.9E-07	5.9E-03	5.9E-07
aluminum	7429-90-5	2.8E+01	3,000	9.3E-03		1.4E+01	4.6E-03	1.4E+01	4.6E-03
Aniline	62-53-3	5.9E-03	30,000	2.0E-07		3.0E-03	9.9E-08	3.0E-03	9.9E-08
Anthracene	120-12-7	9.6E-05	270	3.6E-07		4.8E-05	1.8E-07	4.8E-05	1.8E-07
Antimony	7440-36-0	2.1E-02	500	4.3E-05		1.1E-02	2.1E-05	1.1E-02	2.1E-05
Arsenic	7440-38-2	3.8E-04	0.2	1.9E-03		1.9E-04	9.5E-04	1.9E-04	9.5E-04
Barium	7440-39-3	2.7E-04	1,500	1.8E-07		1.4E-04	9.0E-08	1.4E-04	9.0E-08
Benzaldehyde	100-52-7	2.8E-02	17,000	1.7E-06		1.4E-02	8.3E-07	1.4E-02	8.3E-07
Benzene	71-43-2	8.9E-02	27	3.3E-03		4.4E-02	1.6E-03	4.4E-02	1.6E-03
Benzo(a)anthracene	56-55-3	4.2E-04	1,200	3.5E-07		2.1E-04	1.8E-07	2.1E-04	1.8E-07
Benzo(a)pyrene	50-32-8	5.5E-05	600	9.1E-08		2.7E-05	4.6E-08	2.7E-05	4.6E-08
Benzo(b)fluoranthene	205-99-2	8.5E-04	31	2.7E-05		4.2E-04	1.4E-05	4.2E-04	1.4E-05
benzo(g,h,i)perylene	191-24-2	3.2E-04	30,000	1.1E-08		1.6E-04	5.3E-09	1.6E-04	5.3E-09
Benzo(k)fluoranthene	207-08-9	8.2E-04	19	4.3E-05		4.1E-04	2.2E-05	4.1E-04	2.2E-05
Benzoic acid	65-85-0	4.6E-02	2,800	1.7E-05		2.3E-02	8.2E-06	2.3E-02	8.2E-06
Benzyl alcohol	100-51-6	5.8E-04	130,000	4.4E-09		2.9E-04	2.2E-09	2.9E-04	2.2E-09
Benzyl chloride	100-44-7	4.2E-04	240	1.8E-06		2.1E-04	8.8E-07	2.1E-04	8.8E-07
Bis(2-chlorethyl)ether	111-44-4	4.5E-04	58,000	7.8E-09		2.3E-04	3.9E-09	2.3E-04	3.9E-09
bis(2-chloroethoxy)methane	111-91-1	4.1E-04	920	4.4E-07		2.0E-04	2.2E-07	2.0E-04	2.2E-07
Bromodichloromethane	75-27-4	5.8E-04	260	2.2E-06		2.9E-04	1.1E-06	2.9E-04	1.1E-06
Bromoform (Tribromomethane)	75-25-2	9.6E-04	15,000	6.4E-08		4.8E-04	3.2E-08	4.8E-04	3.2E-08
Bromophenyl-phenylether, 4-	101-55-3	4.1E-04	290	1.4E-06		2.0E-04	7.0E-07	2.0E-04	7.0E-07
Butylbenzylphthalate	85-68-7	1.1E-04	15,000	7.4E-09		5.5E-05	3.7E-09	5.5E-05	3.7E-09
Cadmium	7440-43-9	3.3E-05	100	3.3E-07		1.6E-05	1.6E-07	1.6E-05	1.6E-07
carbazole	86-74-8	5.2E-04	660	7.9E-07		2.6E-04	3.9E-07	2.6E-04	3.9E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	7.3E-03	6,200	1.2E-06		3.6E-03	5.8E-07	3.6E-03	5.8E-07
Carbon tetrachloride	56-23-5	1.1E-02	1,900	5.8E-06		5.5E-03	2.9E-06	5.5E-03	2.9E-06
Chlorine	7782-50-5	8.7E+00	210	4.2E-02		4.4E+00	2.1E-02	4.4E+00	2.1E-02
Chloro-3-methylphenol, 4-	59-50-7	5.0E-04	5,500	9.1E-08		2.5E-04	4.6E-08	2.5E-04	4.6E-08
chloroacetonitrile	107-14-2	8.1E-04	9,000	9.1E-08		4.1E-04	4.5E-08	4.1E-04	4.5E-08
Chloroaniline, p-	106-47-8	1.1E-04	2,200	5.2E-08		5.7E-05	2.6E-08	5.7E-05	2.6E-08
Chlorobenzene	108-90-7	1.9E-03	46,000	4.0E-08		9.2E-04	2.0E-08	9.2E-04	2.0E-08
Chloroethane	75-00-3	3.3E-04	260,000	1.3E-09		1.6E-04	6.3E-10	1.6E-04	6.3E-10
Chloroform (Trichloromethane)	67-66-3	4.5E-03	150	3.0E-05		2.3E-03	1.5E-05	2.3E-03	1.5E-05
Chloronaphthalene,2-	91-58-7	4.1E-04	600	6.8E-07		2.0E-04	3.4E-07	2.0E-04	3.4E-07
Chlorophenol, 2-	95-57-8	1.4E-03	1,300	1.1E-06		7.1E-04	5.5E-07	7.1E-04	5.5E-07
Chromium III	7440-47-3	7.7E-03	1,500	5.1E-06		3.8E-03	2.5E-06	1.9E-04	1.3E-07
Chromium, hexavalent	18540-29-9	6.3E-03	89	7.0E-05		3.1E-03	3.5E-05	1.6E-04	1.8E-06
Chrysene	218-01-9	5.3E-04	600	8.8E-07		2.6E-04	4.4E-07	2.6E-04	4.4E-07
cis-1,3-dichloropropene	10062-01-5	9.6E-04	600	1.6E-06		4.8E-04	8.0E-07	4.8E-04	8.0E-07
cis-2-butene	590-18-1	1.3E-03	150,000,000	8.4E-12		6.3E-04	4.2E-12	6.3E-04	4.2E-12
cobalt	7440-48-4	8.3E-05	180	4.6E-07		4.2E-05	2.3E-07	4.2E-05	2.3E-07
copper	7440-50-8	1.7E-02	100	1.7E-04		8.7E-03	8.7E-05	8.7E-03	8.7E-05
Cresol, m-	108-39-4	9.5E-05	20,000	4.8E-09		4.8E-05	2.4E-09	4.8E-05	2.4E-09
Cresol, o-	95-48-7	2.4E-03	20,000	1.2E-07		1.2E-03	6.1E-08	1.2E-03	6.1E-08
Cresol, p-	106-44-5	9.5E-05	20,000	4.8E-09		4.8E-05	2.4E-09	4.8E-05	2.4E-09
crotonaldehyde	4170-30-3	2.4E-03	540	4.4E-06		1.2E-03	2.2E-06	1.2E-03	2.2E-06
Cumene (Isopropylbenzene)	98-82-8	3.1E-04	250,000	1.2E-09		1.6E-04	6.2E-10	1.6E-04	6.2E-10
cyclohexane	110-82-7	1.9E-03	340,000	5.4E-09		9.2E-04	2.7E-09	9.2E-04	2.7E-09
Dibenz(a,h)anthracene	53-70-3	7.2E-05	34	2.1E-06		3.6E-05	1.1E-06	3.6E-05	1.1E-06
dibenzofuran	132-64-9	4.1E-04	30,000	1.4E-08		2.0E-04	6.8E-09	2.0E-04	6.8E-09
Dibromochloromethane	124-48-1	6.5E-04	7,400	8.8E-08		3.3E-04	4.4E-08	3.3E-04	4.4E-08
Dichlorobenzene, 1,2-	95-50-1	4.1E-04	300,000	1.4E-09		2.1E-04	6.9E-10	2.1E-04	6.9E-10
Dichlorobenzene, 1,3-	541-73-1	4.6E-04	16,000	2.9E-08		2.3E-04	1.4E-08	2.3E-04	1.4E-08

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	4.3E-04	60,000	7.2E-09		2.1E-04	3.6E-09	2.1E-04	3.6E-09
Dichloroethane 1,1-	75-34-3	2.4E-04	650,000	3.6E-10		1.2E-04	1.8E-10	1.2E-04	1.8E-10
Dichloroethane, 1,2- (Ethylene Dichloride)	107-06-2	4.0E-04	200,000	2.0E-09		2.0E-04	1.0E-09	2.0E-04	1.0E-09
Dichloroethylene 1,1-	75-35-4	3.2E-04	180,000	1.8E-09		1.6E-04	8.8E-10	1.6E-04	8.8E-10
Dichloroethylene, cis-1,2-	156-59-2	8.9E-05	560,000	1.6E-10		4.4E-05	7.9E-11	4.4E-05	7.9E-11
Dichloroethylene-1,2 (trans)	156-60-5	5.3E-04	1,100,000	4.8E-10		2.7E-04	2.4E-10	2.7E-04	2.4E-10
Dichlorophenol, 2,4-	120-83-2	6.9E-04	1,300	5.3E-07		3.4E-04	2.6E-07	3.4E-04	2.6E-07
Dichloropropane, 1,2-	78-87-5	2.7E-04	140,000	2.0E-09		1.4E-04	9.8E-10	1.4E-04	9.8E-10
Diethyl phthalate	84-66-2	5.9E-04	5,000	1.2E-07		3.0E-04	5.9E-08	3.0E-04	5.9E-08
Dimethyl phthalate	131-11-3	4.1E-04	15,000	2.7E-08		2.0E-04	1.4E-08	2.0E-04	1.4E-08
Dimethylphenol, 2,4-	105-67-9	5.1E-03	4,500	1.1E-06		2.6E-03	5.7E-07	2.6E-03	5.7E-07
Di-n-butyl phthalate	84-74-2	8.1E-03	15,000	5.4E-07		4.1E-03	2.7E-07	4.1E-03	2.7E-07
Dinitrobenzene, 1,3-	99-65-0	4.2E-04	1,000	4.2E-07		2.1E-04	2.1E-07	2.1E-04	2.1E-07
Dinitrophenol, 2,4-	51-28-5	1.8E-02	220	8.1E-05		8.9E-03	4.0E-05	8.9E-03	4.0E-05
Dinitrotoluene, 2,4-	121-14-2	4.1E-04	600	6.8E-07		2.0E-04	3.4E-07	2.0E-04	3.4E-07
Dinitrotoluene, 2,6-	606-20-2	4.2E-04	600	7.0E-07		2.1E-04	3.5E-07	2.1E-04	3.5E-07
Di-n-octylphthalate	117-84-0	2.7E-03	6,800	4.0E-07		1.4E-03	2.0E-07	1.4E-03	2.0E-07
Dioxane, 1,4-	123-91-1	4.7E-04	3,000	1.6E-07		2.4E-04	7.9E-08	2.4E-04	7.9E-08
diphenylamine	122-39-4	4.1E-04	30,000	1.4E-08		2.0E-04	6.8E-09	2.0E-04	6.8E-09
Ethyl methacrylate	97-63-2	1.2E-03	13,000	9.1E-08		5.9E-04	4.5E-08	5.9E-04	4.5E-08
Ethylbenzene	100-41-4	8.1E-03	140,000	5.8E-08		4.1E-03	2.9E-08	4.1E-03	2.9E-08
Ethylene Dibromide	106-93-4	6.6E-04	130,000	5.1E-09		3.3E-04	2.5E-09	3.3E-04	2.5E-09
ethylether	60-29-7	1.9E-03	1,500,000	1.2E-09		9.2E-04	6.2E-10	9.2E-04	6.2E-10
Ethylhexyl phthalate, bis-2-	117-81-7	8.3E-04	10,000	8.3E-08		4.1E-04	4.1E-08	4.1E-04	4.1E-08
Fluoranthene	206-44-0	1.9E-03	1,500	1.3E-06		9.7E-04	6.5E-07	9.7E-04	6.5E-07
Fluorene	86-73-7	4.8E-04	6,600	7.3E-08		2.4E-04	3.7E-08	2.4E-04	3.7E-08
Formaldehyde	50-00-0	3.5E-02	55	6.3E-04		1.7E-02	3.2E-04	1.7E-02	3.2E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	2.0E-08	3	6.8E-09		1.0E-08	3.4E-09	1.0E-08	3.4E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	5.1E-07	45	1.1E-08		2.6E-07	5.7E-09	2.6E-07	5.7E-09

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.3E-07	60	2.2E-09		6.7E-08	1.1E-09	6.7E-08	1.1E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	2.5E-09	0.07	3.5E-08		1.2E-09	1.8E-08	1.2E-09	1.8E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	6.3E-09	0.75	8.3E-09		3.1E-09	4.2E-09	3.1E-09	4.2E-09
HexaCDD, 1,2,3,7,8,9-	19408-74-3	4.3E-09	4	1.1E-09		2.1E-09	5.3E-10	2.1E-09	5.3E-10
HexaCDF, 1,2,3,4,7,8-	70648-26-9	1.8E-07	0.07	2.6E-06		9.1E-08	1.3E-06	9.1E-08	1.3E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.1E-07	0.04	2.8E-06		5.6E-08	1.4E-06	5.6E-08	1.4E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	8.5E-08	30	2.8E-09		4.2E-08	1.4E-09	4.2E-08	1.4E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.3E-07	0.49	2.7E-07		6.7E-08	1.4E-07	6.7E-08	1.4E-07
Hexachloro-1,3-butadiene	87-68-3	6.0E-04	11,000	5.5E-08		3.0E-04	2.7E-08	3.0E-04	2.7E-08
Hexachlorobenzene	118-74-1	3.5E-03	6	5.8E-04		1.7E-03	2.9E-04	1.7E-03	2.9E-04
Hexachlorocyclopentadiene	77-47-4	8.1E-03	110	7.4E-05		4.1E-03	3.7E-05	4.1E-03	3.7E-05
Hexachloroethane (Perchloroethane)	67-72-1	4.4E-04	29,000	1.5E-08		2.2E-04	7.5E-09	2.2E-04	7.5E-09
hexachloropropene	1888-71-7	5.8E-04	905	6.5E-07		2.9E-04	3.2E-07	2.9E-04	3.2E-07
hexane	110-54-3	7.3E-03	1,100,000	6.6E-09		3.6E-03	3.3E-09	3.6E-03	3.3E-09
Hydrogen chloride	7647-01-0	1.3E+01	2,100	6.3E-03		6.6E+00	3.1E-03	6.6E+00	3.1E-03
Indeno(1,2,3-cd) pyrene	193-39-5	2.8E-04	15	1.8E-05		1.4E-04	9.2E-06	1.4E-04	9.2E-06
Isophorone	78-59-1	4.1E-04	23,000	1.8E-08		2.0E-04	8.8E-09	2.0E-04	8.8E-09
Lead	7439-92-1	2.9E-02	150	1.9E-04		1.4E-02	9.5E-05	1.4E-02	9.5E-05
manganese	7439-96-5	6.5E-02	3,000	2.2E-05		3.3E-02	1.1E-05	3.3E-02	1.1E-05
Mercuric chloride	7487-94-7	3.7E-06	2,700	1.4E-09		1.9E-06	6.9E-10	1.9E-06	6.9E-10
Methacrylonitrile	126-98-7	4.4E-03	2,700	1.6E-06		2.2E-03	8.1E-07	2.2E-03	8.1E-07
Methyl bromide (Bromomethane)	74-83-9	8.9E-05	74,000	1.2E-09		4.4E-05	6.0E-10	4.4E-05	6.0E-10
Methyl chloride (Chloromethane)	74-87-3	1.0E-02	210,000	4.9E-08		5.2E-03	2.5E-08	5.2E-03	2.5E-08
Methyl ethyl ketone (2-Butanone)	78-93-3	2.9E-03	13,000	2.2E-07		1.4E-03	1.1E-07	1.4E-03	1.1E-07
Methyl isobutyl ketone	108-10-1	6.1E-04	310,000	2.0E-09		3.0E-04	9.8E-10	3.0E-04	9.8E-10
methyl tert-butyl ether	1634-04-4	9.6E-03	180,000	5.4E-08		4.8E-03	2.7E-08	4.8E-03	2.7E-08
methylcyclohexane	108-87-2	8.9E-03	1,600,000	5.6E-09		4.4E-03	2.8E-09	4.4E-03	2.8E-09
Methylene chloride	75-09-2	1.8E-01	14,000	1.3E-05		8.9E-02	6.3E-06	8.9E-02	6.3E-06
methymethacrylate	80-62-6	1.2E-03	70,000	1.7E-08		5.9E-04	8.4E-09	5.9E-04	8.4E-09

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	6.8E-02	79,000	8.6E-07		3.4E-02	4.3E-07	3.4E-02	4.3E-07
Nickel	7440-02-0	4.0E-02	0.2	2.0E-01		2.0E-02	1.0E-01	3.5E-04	1.7E-03
Nitroaniline, 2-	88-74-4	4.1E-04	4,800	8.5E-08		2.0E-04	4.2E-08	2.0E-04	4.2E-08
Nitroaniline, 3-	99-09-2	1.6E-03	110	1.5E-05		8.1E-04	7.4E-06	8.1E-04	7.4E-06
Nitroaniline, 4-	100-01-6	1.6E-03	9,000	1.8E-07		8.1E-04	9.0E-08	8.1E-04	9.0E-08
Nitrobenzene	98-95-3	4.6E-04	9,100	5.1E-08		2.3E-04	2.5E-08	2.3E-04	2.5E-08
Nitrophenol, 2-	88-75-5	3.5E-03	1,000	3.5E-06		1.7E-03	1.7E-06	1.7E-03	1.7E-06
Nitrophenol, 4-	100-02-7	2.7E-03	1,200	2.2E-06		1.3E-03	1.1E-06	1.3E-03	1.1E-06
Nitroso-di-n-butylamine, n-	924-16-3	4.1E-04	2,000	2.0E-07		2.0E-04	1.0E-07	2.0E-04	1.0E-07
Nitrosodiphenylamine, N-	86-30-6	7.2E-05	1,400	5.2E-08		3.6E-05	2.6E-08	3.6E-05	2.6E-08
Nitrosodipropylamine, n-	621-64-7	4.1E-04	2,000	2.0E-07		2.0E-04	1.0E-07	2.0E-04	1.0E-07
n-nitrosodiethylamine	55-18-5	4.1E-04	1,700	2.4E-07		2.0E-04	1.2E-07	2.0E-04	1.2E-07
n-nitrosodimethylamine	62-75-9	4.1E-04	1,700	2.4E-07		2.1E-04	1.2E-07	2.1E-04	1.2E-07
n-nitrosomethylethylamine	10595-95-6	6.7E-04	1,700	4.0E-07		3.4E-04	2.0E-07	3.4E-04	2.0E-07
n-nitrosomorpholine	59-89-2	4.1E-04	74	5.5E-06		2.0E-04	2.7E-06	2.0E-04	2.7E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	2.6E-08	3	8.7E-09		1.3E-08	4.3E-09	1.3E-08	4.3E-09
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	3.7E-07	75	5.0E-09		1.9E-07	2.5E-09	1.9E-07	2.5E-09
o-tolualdehyde	529-20-4	3.0E-02	17,000	1.7E-06		1.5E-02	8.7E-07	1.5E-02	8.7E-07
p-dimethylaminoazobenzene	60-11-7	3.9E-04	670	5.8E-07		1.9E-04	2.9E-07	1.9E-04	2.9E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	4.7E-09	0.1	4.7E-08		2.4E-09	2.4E-08	2.4E-09	2.4E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	5.7E-08	0.24	2.4E-07		2.8E-08	1.2E-07	2.8E-08	1.2E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	1.1E-07	0.07	1.6E-06		5.7E-08	8.1E-07	5.7E-08	8.1E-07
Pentachlorobenzene	608-93-5	4.1E-04	1,600	2.5E-07		2.0E-04	1.3E-07	2.0E-04	1.3E-07
pentachloroethane	76-01-7	5.2E-04	320,000	1.6E-09		2.6E-04	8.1E-10	2.6E-04	8.1E-10
Pentachloronitrobenzene (PCNB)	82-68-8	4.3E-04	1,500	2.9E-07		2.1E-04	1.4E-07	2.1E-04	1.4E-07
Pentachlorophenol	87-86-5	2.0E-02	1,400	1.4E-05		1.0E-02	7.2E-06	1.0E-02	7.2E-06
perchlorate	14797-73-0	3.4E-04	23	1.5E-05		1.7E-04	7.5E-06	1.7E-04	7.5E-06
Phenanthrene	85-01-8	2.3E-03	760	3.1E-06		1.2E-03	1.5E-06	1.2E-03	1.5E-06
Phenol	108-95-2	2.2E-03	5,800	3.8E-07		1.1E-03	1.9E-07	1.1E-03	1.9E-07

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
phosphorous	7723-14-0	7.7E-02	270	2.8E-04		3.8E-02	1.4E-04	3.8E-02	1.4E-04
propanal	123-38-6	3.9E-02	110,000	3.5E-07		1.9E-02	1.7E-07	1.9E-02	1.7E-07
propylbenzene	103-65-1	3.4E-03	5,400	6.3E-07		1.7E-03	3.1E-07	1.7E-03	3.1E-07
propylene	115-07-1	3.6E-02	860,000	4.2E-08		1.8E-02	2.1E-08	1.8E-02	2.1E-08
Pyrene	129-00-0	1.7E-03	150	1.1E-05		8.3E-04	5.5E-06	8.3E-04	5.5E-06
Pyridine	110-86-1	6.0E-04	9,700	6.2E-08		3.0E-04	3.1E-08	3.0E-04	3.1E-08
Selenium	7782-49-2	1.1E-03	200	5.6E-06		5.6E-04	2.8E-06	5.6E-04	2.8E-06
Silver	7440-22-4	8.4E-04	100	8.4E-06		4.2E-04	4.2E-06	4.2E-04	4.2E-06
Styrene	100-42-5	9.6E-04	21,000	4.6E-08		4.8E-04	2.3E-08	4.8E-04	2.3E-08
TetraCDD, 2,3,7,8-	1746-01-6	1.7E-09	0.00003	5.6E-05		8.3E-10	2.8E-05	8.3E-10	2.8E-05
TetraCDF, 2,3,7,8-	51207-31-9	2.9E-08	0.07	4.2E-07		1.5E-08	2.1E-07	1.5E-08	2.1E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	4.1E-04	240	1.7E-06		2.0E-04	8.4E-07	2.0E-04	8.4E-07
Tetrachloroethane, 1,1,2,2-	79-34-5	3.1E-04	7,000	4.4E-08		1.6E-04	2.2E-08	1.6E-04	2.2E-08
Tetrachloroethylene (Perchloroethylene)	127-18-4	1.9E-03	20,000	9.3E-08		9.2E-04	4.6E-08	9.2E-04	4.6E-08
Tetrachlorophenol, 2,3,4,6-	58-90-2	5.3E-04	1,300	4.1E-07		2.6E-04	2.0E-07	2.6E-04	2.0E-07
Tetrahydrofuran	109-99-9	6.7E-04	290,000	2.3E-09		3.3E-04	1.1E-09	3.3E-04	1.1E-09
Toluene	108-88-3	2.1E-02	37,000	5.6E-07		1.0E-02	2.8E-07	1.0E-02	2.8E-07
Toluidine, o-	95-53-4	5.2E-03	8,800	5.9E-07		2.6E-03	2.9E-07	2.6E-03	2.9E-07
trans-1,3-dichloropropene	10061-02-6	4.5E-04	75,000	6.0E-09		2.3E-04	3.0E-09	2.3E-04	3.0E-09
trans-2-butene	624-64-6	5.7E-03	1,000,000	5.7E-09		2.8E-03	2.8E-09	2.8E-03	2.8E-09
Trichlorobenzene, 1,2,4-	120-82-1	4.8E-04	3,400	1.4E-07		2.4E-04	7.0E-08	2.4E-04	7.0E-08
Trichloroethane, 1,1,1-	71-55-6	2.0E-04	1,300,000	1.5E-10		1.0E-04	7.7E-11	1.0E-04	7.7E-11
Trichloroethane, 1,1,2-	79-00-5	5.4E-04	81,000	6.7E-09		2.7E-04	3.3E-09	2.7E-04	3.3E-09
Trichloroethylene	79-01-6	7.0E-04	700,000	9.9E-10		3.5E-04	5.0E-10	3.5E-04	5.0E-10
Trichlorophenol, 2,4,5-	95-95-4	1.1E-03	7,400	1.4E-07		5.2E-04	7.1E-08	5.2E-04	7.1E-08
Trichlorophenol, 2,4,6-	88-06-2	9.7E-04	1,800	5.4E-07		4.8E-04	2.7E-07	4.8E-04	2.7E-07
Trimethylbenzene, 1,3,5-	108-67-8	1.4E-02	690,000	2.0E-08		7.0E-03	1.0E-08	7.0E-03	1.0E-08
Trinitrobenzene, 1,3,5 (sym-)	99-35-4	4.1E-04	530	7.7E-07		2.0E-04	3.8E-07	2.0E-04	3.8E-07
undecane	1120-21-4	8.9E-03	1,500	5.9E-06		4.4E-03	3.0E-06	4.4E-03	3.0E-06

COPC Name	CAS Number	Acute Air Conc (ug/m3)	AIEC (ug/m3)	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	5.6E-03	180,000	3.1E-08		2.8E-03	1.6E-08	2.8E-03	1.6E-08
Xylene, m-	108-38-3	8.1E-03	22,000	3.7E-07		4.1E-03	1.8E-07	4.1E-03	1.8E-07
Xylene, o-	95-47-6	9.6E-03	22,000	4.4E-07		4.8E-03	2.2E-07	4.8E-03	2.2E-07
Xylene, p-	106-42-3	8.1E-03	22,000	3.7E-07		4.1E-03	1.8E-07	4.1E-03	1.8E-07
Zinc	7440-66-6	3.9E-02	1,900	2.1E-05		1.9E-02	1.0E-05	1.9E-02	1.0E-05
			Total	**0.3**		**Total**	**0.1**	**With adjusted Ni & Cr**	**3.4E-02**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	4.3E-03	690,000	6.2E-09		2.1E-03	3.1E-09	2.1E-03	3.1E-09
1,2,4-Trimethylbenzene	95-63-6	2.6E-01	690,000	3.7E-07		1.3E-01	1.8E-07	1.3E-01	1.8E-07
1,4-Diethylbenzene	105-05-5	6.9E-03	12,000	5.7E-07		3.4E-03	2.8E-07	3.4E-03	2.8E-07
1-Butene	106-98-9	2.3E-01	1,200,000	1.9E-07		1.1E-01	9.4E-08	1.1E-01	9.4E-08
1-Chloronapthalene	90-13-1	5.6E-03	4,600	1.2E-06		2.8E-03	6.1E-07	2.8E-03	6.1E-07
1-Naphthylamine	134-32-7	1.1E-01	210	5.4E-04		5.6E-02	2.7E-04	5.6E-02	2.7E-04
2,2,4-Trimethylpentane	540-84-1	2.5E-01	14,000,000	1.8E-08		1.2E-01	8.8E-09	1.2E-01	8.8E-09
2,2-Dimethylbutane	75-83-2	1.4E-02	1,800,000	8.0E-09		7.1E-03	4.0E-09	7.1E-03	4.0E-09
2,3,4-Trimethylpentane	565-75-3	8.4E-02	14,000,000	6.0E-09		4.2E-02	3.0E-09	4.2E-02	3.0E-09
2,3-Dimethylbutane	79-29-8	3.6E-02	1,800,000	2.0E-08		1.8E-02	9.9E-09	1.8E-02	9.9E-09
2,3-Dimethylpentane	565-59-3	1.4E-01	1,800,000	8.0E-08		7.1E-02	4.0E-08	7.1E-02	4.0E-08
2,4-Dimethylpentane	108-08-7	5.3E-02	180,000	3.0E-07		2.7E-02	1.5E-07	2.7E-02	1.5E-07
2,5-Dimethylbenzaldehyde	5779-94-2	2.8E-01	17,000	1.6E-05		1.4E-01	8.1E-06	1.4E-01	8.1E-06
2,6-Dichlorophenol	87-65-0	5.6E-03	8,800	6.4E-07		2.8E-03	3.2E-07	2.8E-03	3.2E-07
2-Ethyltoluene	611-14-3	4.6E-03	12,000	3.8E-07		2.3E-03	1.9E-07	2.3E-03	1.9E-07
2-Hexanone	591-78-6	2.0E-02	41,000	5.0E-07		1.0E-02	2.5E-07	1.0E-02	2.5E-07
2-Methylhexane	591-76-4	1.7E-01	1,800,000	9.7E-08		8.7E-02	4.8E-08	8.7E-02	4.8E-08
2-Methylnaphthalene	91-57-6	7.6E-02	3,000	2.5E-05		3.8E-02	1.3E-05	3.8E-02	1.3E-05
2-Methylpentane	107-83-5	1.1E-01	1,800,000	6.3E-08		5.6E-02	3.1E-08	5.6E-02	3.1E-08
2-Naphthylamine	91-59-8	1.1E-01	320	3.5E-04		5.6E-02	1.8E-04	5.6E-02	1.8E-04
3-Ethyltoluene	620-14-4	4.9E-02	12,000	4.1E-06		2.5E-02	2.0E-06	2.5E-02	2.0E-06
3-Methylheptane	589-81-1	3.6E-02	1,400,000	2.6E-08		1.8E-02	1.3E-08	1.8E-02	1.3E-08
3-Methylhexane	589-34-4	2.3E-01	1,800,000	1.3E-07		1.1E-01	6.2E-08	1.1E-01	6.2E-08
3-Methylpentane	96-14-0	7.3E-02	1,800,000	4.0E-08		3.6E-02	2.0E-08	3.6E-02	2.0E-08
4,6-Dinitro-2-methylphenol	534-52-1	9.7E-02	200	4.9E-04		4.9E-02	2.4E-04	4.9E-02	2.4E-04
4-Aminobyphenyl	92-67-1	1.1E-01	490	2.3E-04		5.6E-02	1.1E-04	5.6E-02	1.1E-04
4-Ethyltoluene	622-96-8	5.4E-02	12,000	4.5E-06		2.7E-02	2.3E-06	2.7E-02	2.3E-06
Acenaphthene	83-32-9	5.6E-03	3,600	1.6E-06		2.8E-03	7.8E-07	2.8E-03	7.8E-07
Acenaphthylene	208-96-8	3.2E-02	10,000	3.2E-06		1.6E-02	1.6E-06	1.6E-02	1.6E-06

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	9.5E-01	470	2.0E-03		4.7E-01	1.0E-03	4.7E-01	1.0E-03
Acetone	67-64-1	2.5E-01	470,000	5.2E-07		1.2E-01	2.6E-07	1.2E-01	2.6E-07
Acetonitrile	75-05-8	1.9E-01	22,000	8.8E-06		9.7E-02	4.4E-06	9.7E-02	4.4E-06
Acetophenone	98-86-2	2.7E-02	10,000	2.7E-06		1.4E-02	1.4E-06	1.4E-02	1.4E-06
Acrylonitrile	107-13-1	1.6E-01	10,000	1.6E-05		8.2E-02	8.2E-06	8.2E-02	8.2E-06
Aluminum	7429-90-5	4.0E+02	3,000	1.3E-01		2.0E+02	6.7E-02	2.0E+02	6.7E-02
Aniline	62-53-3	8.2E-02	30,000	2.7E-06		4.1E-02	1.4E-06	4.1E-02	1.4E-06
Anthracene	120-12-7	1.3E-03	270	4.9E-06		6.6E-04	2.5E-06	6.6E-04	2.5E-06
Antimony	7440-36-0	3.0E-01	500	5.9E-04		1.5E-01	3.0E-04	1.5E-01	3.0E-04
Arsenic	7440-38-2	5.6E-03	0.20	2.8E-02		2.8E-03	1.4E-02	2.8E-03	1.4E-02
Barium	7440-39-3	3.9E-03	1,500	2.6E-06		2.0E-03	1.3E-06	2.0E-03	1.3E-06
Benzaldehyde	100-52-7	3.9E-01	17,000	2.3E-05		1.9E-01	1.1E-05	1.9E-01	1.1E-05
Benzene	71-43-2	1.2E+00	27	4.5E-02		6.1E-01	2.3E-02	6.1E-01	2.3E-02
Benzo(a)anthracene	56-55-3	6.0E-03	1,200	5.0E-06		3.0E-03	2.5E-06	3.0E-03	2.5E-06
Benzo(a)pyrene	50-32-8	7.8E-04	600	1.3E-06		3.9E-04	6.5E-07	3.9E-04	6.5E-07
Benzo(b)fluoranthene	205-99-2	1.2E-02	31	3.8E-04		5.9E-03	1.9E-04	5.9E-03	1.9E-04
Benzo(g,h,i)perylene	191-24-2	4.6E-03	30,000	1.5E-07		2.3E-03	7.7E-08	2.3E-03	7.7E-08
Benzo(k)fluoranthene	207-08-9	1.2E-02	19	6.2E-04		5.8E-03	3.1E-04	5.8E-03	3.1E-04
Benzoic acid	65-85-0	6.4E-01	2,800	2.3E-04		3.2E-01	1.1E-04	3.2E-01	1.1E-04
Benzyl alcohol	100-51-6	7.9E-03	130,000	6.1E-08		4.0E-03	3.1E-08	4.0E-03	3.1E-08
Benzyl chloride	100-44-7	5.8E-03	240	2.4E-05		2.9E-03	1.2E-05	2.9E-03	1.2E-05
Bis(2-chlorethyl)ether	111-44-4	6.3E-03	58,000	1.1E-07		3.1E-03	5.4E-08	3.1E-03	5.4E-08
Bis(2-chloroethoxy)methane	111-91-1	5.6E-03	920	6.1E-06		2.8E-03	3.0E-06	2.8E-03	3.0E-06
Bromodichloromethane	75-27-4	8.0E-03	260	3.1E-05		4.0E-03	1.5E-05	4.0E-03	1.5E-05
Bromoform	75-25-2	1.3E-02	15,000	8.9E-07		6.6E-03	4.4E-07	6.6E-03	4.4E-07
Bromophenyl-phenylether, 4-	101-55-3	5.6E-03	290	1.9E-05		2.8E-03	9.6E-06	2.8E-03	9.6E-06
Butylbenzylphthalate	85-68-7	1.5E-03	15,000	1.0E-07		7.7E-04	5.1E-08	7.7E-04	5.1E-08
Cadmium	7440-43-9	4.8E-04	100	4.8E-06		2.4E-04	2.4E-06	2.4E-04	2.4E-06
Carbazole	86-74-8	7.2E-03	660	1.1E-05		3.6E-03	5.4E-06	3.6E-03	5.4E-06

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	1.0E-01	6,200	1.6E-05		5.0E-02	8.1E-06	5.0E-02	8.1E-06
Carbon tetrachloride	56-23-5	1.5E-01	1,900	8.1E-05		7.7E-02	4.0E-05	7.7E-02	4.0E-05
Chlorine	7782-50-5	1.2E+02	210	5.7E-01		6.0E+01	2.9E-01	6.0E+01	2.9E-01
Chloro-3-methylphenol, 4-	59-50-7	6.9E-03	5,500	1.3E-06		3.5E-03	6.3E-07	3.5E-03	6.3E-07
Chloroacetonitrile	107-14-2	1.1E-02	9,000	1.3E-06		5.6E-03	6.2E-07	5.6E-03	6.2E-07
Chloroaniline, p-	106-47-8	1.6E-03	2,200	7.2E-07		7.9E-04	3.6E-07	7.9E-04	3.6E-07
Chlorobenzene	108-90-7	2.6E-02	46,000	5.6E-07		1.3E-02	2.8E-07	1.3E-02	2.8E-07
Chloroethane	75-00-3	4.5E-03	260,000	1.7E-08		2.2E-03	8.6E-09	2.2E-03	8.6E-09
Chloroform (Trichloromethane)	67-66-3	6.2E-02	150	4.2E-04		3.1E-02	2.1E-04	3.1E-02	2.1E-04
Chloronaphthalene,2-	91-58-7	5.6E-03	600	9.3E-06		2.8E-03	4.7E-06	2.8E-03	4.7E-06
Chlorophenol, 2-	95-57-8	2.0E-02	1,300	1.5E-05		9.8E-03	7.5E-06	9.8E-03	7.5E-06
Chromium III	7440-47-3	1.1E-01	1,500	7.4E-05		5.6E-02	3.7E-05	2.8E-03	1.9E-06
Chromium, hexavalent	18540-29-9	9.1E-02	89	1.0E-03		4.5E-02	5.1E-04	2.3E-03	2.6E-05
Chrysene	218-01-9	7.4E-03	600	1.2E-05		3.7E-03	6.1E-06	3.7E-03	6.1E-06
Cis-1,3-dichloropropene	10062-01-5	1.3E-02	600	2.2E-05		6.6E-03	1.1E-05	6.6E-03	1.1E-05
cis-2-Butene	590-18-1	1.7E-02	150,000,000	1.2E-10		8.7E-03	5.8E-11	8.7E-03	5.8E-11
Cobalt	7440-48-4	1.2E-03	180	6.7E-06		6.1E-04	3.4E-06	6.1E-04	3.4E-06
Copper	7440-50-8	2.5E-01	100	2.5E-03		1.3E-01	1.3E-03	1.3E-01	1.3E-03
Cresol, m-	108-39-4	1.3E-03	20,000	6.6E-08		6.6E-04	3.3E-08	6.6E-04	3.3E-08
Cresol, o-	95-48-7	3.4E-02	20,000	1.7E-06		1.7E-02	8.4E-07	1.7E-02	8.4E-07
Cresol, p-	106-44-5	1.3E-03	20,000	6.6E-08		6.6E-04	3.3E-08	6.6E-04	3.3E-08
Crotonaldehyde	4170-30-3	3.3E-02	540	6.1E-05		1.6E-02	3.0E-05	1.6E-02	3.0E-05
Cumene	98-82-8	4.3E-03	250,000	1.7E-08		2.1E-03	8.6E-09	2.1E-03	8.6E-09
Cyclohexane	110-82-7	2.6E-02	340,000	7.5E-08		1.3E-02	3.8E-08	1.3E-02	3.8E-08
Dibenz(a,h)anthracene	53-70-3	1.0E-03	34	3.1E-05		5.2E-04	1.5E-05	5.2E-04	1.5E-05
Dibenzofuran	132-64-9	5.6E-03	30,000	1.9E-07		2.8E-03	9.3E-08	2.8E-03	9.3E-08
Dibromochloromethane	124-48-1	9.0E-03	7,400	1.2E-06		4.5E-03	6.1E-07	4.5E-03	6.1E-07
Dichlorobenzene, 1,2-	95-50-1	5.7E-03	300,000	1.9E-08		2.9E-03	9.5E-09	2.9E-03	9.5E-09
Dichlorobenzene, 1,3-	541-73-1	6.4E-03	16,000	4.0E-07		3.2E-03	2.0E-07	3.2E-03	2.0E-07

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	5.9E-03	60,000	9.9E-08		3.0E-03	4.9E-08	3.0E-03	4.9E-08
Dichloroethane 1,1-	75-34-3	3.3E-03	650,000	5.0E-09		1.6E-03	2.5E-09	1.6E-03	2.5E-09
Dichloroethane, 1,2	107-06-2	5.5E-03	200,000	2.8E-08		2.8E-03	1.4E-08	2.8E-03	1.4E-08
Dichloroethylene 1,1-	75-35-4	4.4E-03	180,000	2.4E-08		2.2E-03	1.2E-08	2.2E-03	1.2E-08
Dichloroethylene, cis-1,2-	156-59-2	1.2E-03	560,000	2.2E-09		6.1E-04	1.1E-09	6.1E-04	1.1E-09
Dichloroethylene-1,2 (trans)	156-60-5	7.4E-03	1,100,000	6.7E-09		3.7E-03	3.3E-09	3.7E-03	3.3E-09
Dichlorophenol, 2,4-	120-83-2	9.5E-03	1,300	7.3E-06		4.7E-03	3.6E-06	4.7E-03	3.6E-06
Dichloropropane, 1,2-	78-87-5	3.8E-03	140,000	2.7E-08		1.9E-03	1.3E-08	1.9E-03	1.3E-08
Diethyl phthalate	84-66-2	8.2E-03	5,000	1.6E-06		4.1E-03	8.2E-07	4.1E-03	8.2E-07
Dimethyl phthalate	131-11-3	5.6E-03	15,000	3.7E-07		2.8E-03	1.9E-07	2.8E-03	1.9E-07
Dimethylphenol, 2,4-	105-67-9	7.1E-02	4,500	1.6E-05		3.5E-02	7.8E-06	3.5E-02	7.8E-06
Di-n-butyl phthalate	84-74-2	1.1E-01	15,000	7.5E-06		5.6E-02	3.7E-06	5.6E-02	3.7E-06
Dinitrobenzene, 1,3-	99-65-0	5.8E-03	1,000	5.8E-06		2.9E-03	2.9E-06	2.9E-03	2.9E-06
Dinitrophenol, 2,4-	51-28-5	2.5E-01	220	1.1E-03		1.2E-01	5.6E-04	1.2E-01	5.6E-04
Dinitrotoluene, 2,4-	121-14-2	5.6E-03	600	9.3E-06		2.8E-03	4.7E-06	2.8E-03	4.7E-06
Dinitrotoluene, 2,6-	606-20-2	5.8E-03	600	9.6E-06		2.9E-03	4.8E-06	2.9E-03	4.8E-06
Di-n-octylphthalate	117-84-0	3.8E-02	6,800	5.6E-06		1.9E-02	2.8E-06	1.9E-02	2.8E-06
Dioxane, 1,4-	123-91-1	6.5E-03	3,000	2.2E-06		3.3E-03	1.1E-06	3.3E-03	1.1E-06
Diphenylamine	122-39-4	5.6E-03	30,000	1.9E-07		2.8E-03	9.3E-08	2.8E-03	9.3E-08
Ethyl methacrylate	97-63-2	1.6E-02	13,000	1.3E-06		8.2E-03	6.3E-07	8.2E-03	6.3E-07
Ethylbenzene	100-41-4	1.1E-01	140,000	8.0E-07		5.6E-02	4.0E-07	5.6E-02	4.0E-07
Ethylene Dibromide	106-93-4	9.1E-03	130,000	7.0E-08		4.5E-03	3.5E-08	4.5E-03	3.5E-08
Ethylether	60-29-7	2.6E-02	1,500,000	1.7E-08		1.3E-02	8.5E-09	1.3E-02	8.5E-09
Ethylhexyl phthalate, bis-2-	117-81-7	1.2E-02	10,000	1.2E-06		5.9E-03	5.9E-07	5.9E-03	5.9E-07
Fluoranthene	206-44-0	2.7E-02	1,500	1.8E-05		1.3E-02	8.9E-06	1.3E-02	8.9E-06
Fluorene	86-73-7	6.7E-03	6,600	1.0E-06		3.3E-03	5.1E-07	3.3E-03	5.1E-07
Formaldehyde	50-00-0	4.8E-01	55	8.7E-03		2.4E-01	4.4E-03	2.4E-01	4.4E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	3.0E-07	3	9.8E-08		1.5E-07	4.9E-08	1.5E-07	4.9E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	7.4E-06	45	1.7E-07		3.7E-06	8.2E-08	3.7E-06	8.2E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.9E-06	60	3.2E-08		9.6E-07	1.6E-08	9.6E-07	1.6E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	3.6E-08	0.07	4.8E-07		1.8E-08	2.4E-07	1.8E-08	2.4E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	9.1E-08	0.75	1.2E-07		4.5E-08	6.0E-08	4.5E-08	6.0E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	6.2E-08	4	1.6E-08		3.1E-08	7.9E-09	3.1E-08	7.9E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	2.6E-06	0.07	3.6E-05		1.3E-06	1.8E-05	1.3E-06	1.8E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.6E-06	0.04	4.4E-05		8.1E-07	2.2E-05	8.1E-07	2.2E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.2E-06	30	4.1E-08		6.1E-07	2.0E-08	6.1E-07	2.0E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.9E-06	0.49	3.9E-06		9.6E-07	2.0E-06	9.6E-07	2.0E-06
Hexachloro-1,3-butadiene	87-68-3	8.3E-03	11,000	7.5E-07		4.1E-03	3.8E-07	4.1E-03	3.8E-07
Hexachlorobenzene	118-74-1	4.8E-02	6	7.9E-03		2.4E-02	4.0E-03	2.4E-02	4.0E-03
Hexachlorocyclopentadiene	77-47-4	1.1E-01	110	1.0E-03		5.6E-02	5.1E-04	5.6E-02	5.1E-04
Hexachloroethane (Perchloroethane)	67-72-1	6.0E-03	29,000	2.1E-07		3.0E-03	1.0E-07	3.0E-03	1.0E-07
Hexachloropropene	1888-71-7	8.1E-03	905	8.9E-06		4.0E-03	4.5E-06	4.0E-03	4.5E-06
Hexane	110-54-3	1.0E-01	1,100,000	9.1E-08		5.0E-02	4.5E-08	5.0E-02	4.5E-08
Hydrogen chloride	7647-01-0	1.8E+02	2,100	8.7E-02		9.1E+01	4.3E-02	9.1E+01	4.3E-02
Indeno(1,2,3-cd) pyrene	193-39-5	4.0E-03	15	2.7E-04		2.0E-03	1.3E-04	2.0E-03	1.3E-04
Isophorone	78-59-1	5.6E-03	23,000	2.4E-07		2.8E-03	1.2E-07	2.8E-03	1.2E-07
Lead	7439-92-1	4.1E-01	150	2.8E-03		2.1E-01	1.4E-03	2.1E-01	1.4E-03
Manganese	7439-96-5	9.5E-01	3,000	3.2E-04		4.7E-01	1.6E-04	4.7E-01	1.6E-04
Mercuric chloride	7487-94-7	5.4E-05	2,700	2.0E-08		2.7E-05	1.0E-08	2.7E-05	1.0E-08
Methacrylonitrile	126-98-7	6.0E-02	2,700	2.2E-05		3.0E-02	1.1E-05	3.0E-02	1.1E-05
Methyl bromide	74-83-9	1.2E-03	3,900	3.1E-07		6.1E-04	1.6E-07	6.1E-04	1.6E-07
Methyl chloride	74-87-3	1.4E-01	210,000	6.8E-07		7.1E-02	3.4E-07	7.1E-02	3.4E-07
Methyl ethyl ketone	78-93-3	4.0E-02	13,000	3.1E-06		2.0E-02	1.5E-06	2.0E-02	1.5E-06
Methyl isobutyl ketone	108-10-1	8.4E-03	310,000	2.7E-08		4.2E-03	1.4E-08	4.2E-03	1.4E-08
Methyl tert-butyl ether	1634-04-4	1.3E-01	180,000	7.4E-07		6.6E-02	3.7E-07	6.6E-02	3.7E-07
Methylcyclohexane	108-87-2	1.2E-01	1,600,000	7.7E-08		6.1E-02	3.8E-08	6.1E-02	3.8E-08
Methylene chloride	75-09-2	2.5E+00	14,000	1.8E-04		1.2E+00	8.8E-05	1.2E+00	8.8E-05
Methylmethacrylate	80-62-6	1.6E-02	70,000	2.3E-07		8.2E-03	1.2E-07	8.2E-03	1.2E-07

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	9.4E-01	79,000	1.2E-05		4.7E-01	5.9E-06	4.7E-01	5.9E-06
Nickel	7440-02-0	5.9E-01	0.20	2.9E+00		2.9E-01	1.5E+00	5.0E-03	2.5E-02
Nitroaniline, 2-	88-74-4	5.6E-03	4,800	1.2E-06		2.8E-03	5.8E-07	2.8E-03	5.8E-07
Nitroaniline, 3-	99-09-2	2.2E-02	110	2.0E-04		1.1E-02	1.0E-04	1.1E-02	1.0E-04
Nitroaniline, 4-	100-01-6	2.2E-02	9,000	2.5E-06		1.1E-02	1.2E-06	1.1E-02	1.2E-06
Nitrobenzene	98-95-3	6.4E-03	9,100	7.0E-07		3.2E-03	3.5E-07	3.2E-03	3.5E-07
Nitrophenol, 2-	88-75-5	4.8E-02	1,000	4.8E-05		2.4E-02	2.4E-05	2.4E-02	2.4E-05
Nitrophenol, 4-	100-02-7	3.7E-02	1,200	3.1E-05		1.8E-02	1.5E-05	1.8E-02	1.5E-05
Nitroso-di-n-butylamine, n-	924-16-3	5.6E-03	2,000	2.8E-06		2.8E-03	1.4E-06	2.8E-03	1.4E-06
Nitrosodiphenylamine, N-	86-30-6	1.0E-03	1,400	7.1E-07		5.0E-04	3.6E-07	5.0E-04	3.6E-07
Nitrosodipropylamine, n-	621-64-7	5.6E-03	2,000	2.8E-06		2.8E-03	1.4E-06	2.8E-03	1.4E-06
n-Nitrosodiethylamine	55-18-5	5.6E-03	1,700	3.3E-06		2.8E-03	1.6E-06	2.8E-03	1.6E-06
n-Nitrosodimethylamine	62-75-9	5.7E-03	1,700	3.4E-06		2.8E-03	1.7E-06	2.8E-03	1.7E-06
n-Nitrosomethylethylamine	10595-95-6	9.3E-03	1,700	5.5E-06		4.6E-03	2.7E-06	4.6E-03	2.7E-06
n-Nitrosomorpholine	59-89-2	5.6E-03	74	7.6E-05		2.8E-03	3.8E-05	2.8E-03	3.8E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	3.8E-07	3	1.3E-07		1.9E-07	6.3E-08	1.9E-07	6.3E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	5.4E-06	75	7.2E-08		2.7E-06	3.6E-08	2.7E-06	3.6E-08
o-Tolualdehyde	529-20-4	4.1E-01	17,000	2.4E-05		2.0E-01	1.2E-05	2.0E-01	1.2E-05
p-Dimethylaminoazobenzene	60-11-7	5.6E-03	670	8.3E-06		2.8E-03	4.2E-06	2.8E-03	4.2E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	6.8E-08	0.10	6.8E-07		3.4E-08	3.4E-07	3.4E-08	3.4E-07
PentaCDF, 1,2,3,7,8-	57117-41-6	8.2E-07	0.24	3.4E-06		4.1E-07	1.7E-06	4.1E-07	1.7E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	1.6E-06	0.07	2.2E-05		8.1E-07	1.1E-05	8.1E-07	1.1E-05
Pentachlorobenzene	608-93-5	5.6E-03	1,600	3.5E-06		2.8E-03	1.7E-06	2.8E-03	1.7E-06
Pentachloroethane	76-01-7	7.1E-03	320,000	2.2E-08		3.6E-03	1.1E-08	3.6E-03	1.1E-08
Pentachloronitrobenzene	82-68-8	5.9E-03	1,500	4.0E-06		3.0E-03	2.0E-06	3.0E-03	2.0E-06
Pentachlorophenol	87-86-5	2.8E-01	1,400	2.0E-04		1.4E-01	1.0E-04	1.4E-01	1.0E-04
Perchlorate	14797-73-0	5.0E-03	23	2.2E-04		2.5E-03	1.1E-04	2.5E-03	1.1E-04
Phenanthrene	85-01-8	3.2E-02	760	4.3E-05		1.6E-02	2.1E-05	1.6E-02	2.1E-05
Phenol	108-95-2	3.0E-02	5,800	5.3E-06		1.5E-02	2.6E-06	1.5E-02	2.6E-06

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	1.1E+00	270	4.1E-03		5.6E-01	2.1E-03	5.6E-01	2.1E-03
Propanal	123-38-6	5.3E-01	110,000	4.8E-06		2.7E-01	2.4E-06	2.7E-01	2.4E-06
Propylbenzene	103-65-1	4.7E-02	5,400	8.7E-06		2.3E-02	4.3E-06	2.3E-02	4.3E-06
Propylene	115-07-1	5.0E-01	860,000	5.8E-07		2.5E-01	2.9E-07	2.5E-01	2.9E-07
Pyrene	129-00-0	2.3E-02	150	1.5E-04		1.1E-02	7.7E-05	1.1E-02	7.7E-05
Pyridine	110-86-1	8.3E-03	9,700	8.6E-07		4.1E-03	4.3E-07	4.1E-03	4.3E-07
Selenium	7782-49-2	1.6E-02	200	8.1E-05		8.1E-03	4.0E-05	8.1E-03	4.0E-05
Silver	7440-22-4	1.2E-02	100	1.2E-04		6.1E-03	6.1E-05	6.1E-03	6.1E-05
Styrene	100-42-5	1.3E-02	21,000	6.3E-07		6.6E-03	3.2E-07	6.6E-03	3.2E-07
TetraCDD, 2,3,7,8-	1746-01-6	2.3E-08	0.00003	7.8E-04		1.2E-08	3.9E-04	1.2E-08	3.9E-04
TetraCDF, 2,3,7,8-	51207-31-9	4.1E-07	0.07	5.5E-06		2.0E-07	2.8E-06	2.0E-07	2.8E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	5.6E-03	240	2.3E-05		2.8E-03	1.2E-05	2.8E-03	1.2E-05
Tetrachloroethane, 1,1,2,2-	79-34-5	4.3E-03	7,000	6.1E-07		2.1E-03	3.1E-07	2.1E-03	3.1E-07
Tetrachloroethylene	127-18-4	2.6E-02	20,000	1.3E-06		1.3E-02	6.4E-07	1.3E-02	6.4E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	7.3E-03	1,300	5.6E-06		3.6E-03	2.8E-06	3.6E-03	2.8E-06
Tetrahydrofuran	109-99-9	9.2E-03	290,000	3.2E-08		4.6E-03	1.6E-08	4.6E-03	1.6E-08
Toluene	108-88-3	2.9E-01	37,000	7.7E-06		1.4E-01	3.9E-06	1.4E-01	3.9E-06
Toluidine, o-	95-53-4	7.2E-02	8,800	8.1E-06		3.6E-02	4.1E-06	3.6E-02	4.1E-06
Trans-1,3-dichloropropene	10061-02-6	6.2E-03	75,000	8.3E-08		3.1E-03	4.2E-08	3.1E-03	4.2E-08
trans-2-Butene	624-64-6	7.9E-02	1,000,000	7.9E-08		3.9E-02	3.9E-08	3.9E-02	3.9E-08
Trichlorobenzene, 1,2,4-	120-82-1	6.6E-03	3,400	1.9E-06		3.3E-03	9.7E-07	3.3E-03	9.7E-07
Trichloroethane, 1,1,1-	71-55-6	2.8E-03	1,300,000	2.1E-09		1.4E-03	1.1E-09	1.4E-03	1.1E-09
Trichloroethane, 1,1,2-	79-00-5	7.5E-03	81,000	9.2E-08		3.7E-03	4.6E-08	3.7E-03	4.6E-08
Trichloroethylene	79-01-6	9.6E-03	700,000	1.4E-08		4.8E-03	6.9E-09	4.8E-03	6.9E-09
Trichlorophenol, 2,4,5-	95-95-4	1.5E-02	7,400	2.0E-06		7.2E-03	9.8E-07	7.2E-03	9.8E-07
Trichlorophenol, 2,4,6-	88-06-2	1.3E-02	1,800	7.4E-06		6.7E-03	3.7E-06	6.7E-03	3.7E-06
Trimethylbenzene, 1,3,5-	108-67-8	1.9E-01	690,000	2.8E-07		9.7E-02	1.4E-07	9.7E-02	1.4E-07
Trinitrobenzene, 1,3,5	99-35-4	5.6E-03	530	1.1E-05		2.8E-03	5.3E-06	2.8E-03	5.3E-06
Undecane	1120-21-4	1.2E-01	1,500	8.2E-05		6.1E-02	4.1E-05	6.1E-02	4.1E-05

Sources M-136 A and M-225 A, Acute HQs and HI for South Plant Main Admin, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	7.8E-02	180,000	4.3E-07		3.9E-02	2.2E-07	3.9E-02	2.2E-07
Xylene, m-	108-38-3	1.1E-01	22,000	5.1E-06		5.6E-02	2.6E-06	5.6E-02	2.6E-06
Xylene, o-	95-47-6	1.3E-01	22,000	6.0E-06		6.6E-02	3.0E-06	6.6E-02	3.0E-06
Xylene, p-	106-42-3	1.1E-01	22,000	5.1E-06		5.6E-02	2.6E-06	5.6E-02	2.6E-06
Zinc	7440-66-6	5.7E-01	1,900	3.0E-04		2.8E-01	1.5E-04	2.8E-01	1.5E-04
			Total	**3.8**		**Total**	**1.9**	**With adjusted Ni & Cr**	**0.5**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	4.0E-04	690,000	5.8E-10		2.0E-04	2.9E-10	2.0E-04	2.9E-10
1,2,4-Trimethylbenzene	95-63-6	2.4E-02	690,000	3.5E-08		1.2E-02	1.7E-08	1.2E-02	1.7E-08
1,4-Diethylbenzene	105-05-5	6.4E-04	12,000	5.4E-08		3.2E-04	2.7E-08	3.2E-04	2.7E-08
1-Butene	106-98-9	2.1E-02	1,200,000	1.8E-08		1.1E-02	8.8E-09	1.1E-02	8.8E-09
1-Chloronapthalene	90-13-1	5.3E-04	4,600	1.1E-07		2.6E-04	5.7E-08	2.6E-04	5.7E-08
1-Naphthylamine	134-32-7	1.1E-02	210	5.0E-05		5.3E-03	2.5E-05	5.3E-03	2.5E-05
2,2,4-Trimethylpentane	540-84-1	2.3E-02	14,000,000	1.6E-09		1.2E-02	8.2E-10	1.2E-02	8.2E-10
2,2-Dimethylbutane	75-83-2	1.3E-03	1,800,000	7.5E-10		6.7E-04	3.7E-10	6.7E-04	3.7E-10
2,3,4-Trimethylpentane	565-75-3	7.9E-03	14,000,000	5.6E-10		3.9E-03	2.8E-10	3.9E-03	2.8E-10
2,3-Dimethylbutane	79-29-8	3.4E-03	1,800,000	1.9E-09		1.7E-03	9.3E-10	1.7E-03	9.3E-10
2,3-Dimethylpentane	565-59-3	1.3E-02	1,800,000	7.5E-09		6.7E-03	3.7E-09	6.7E-03	3.7E-09
2,4-Dimethylpentane	108-08-7	5.0E-03	180,000	2.8E-08		2.5E-03	1.4E-08	2.5E-03	1.4E-08
2,5-Dimethylbenzaldehyde	5779-94-2	2.6E-02	17,000	1.5E-06		1.3E-02	7.6E-07	1.3E-02	7.6E-07
2,6-Dichlorophenol	87-65-0	5.3E-04	8,800	6.0E-08		2.6E-04	3.0E-08	2.6E-04	3.0E-08
2-Ethyltoluene	611-14-3	4.3E-04	12,000	3.6E-08		2.2E-04	1.8E-08	2.2E-04	1.8E-08
2-Hexanone	591-78-6	1.9E-03	41,000	4.7E-08		9.6E-04	2.3E-08	9.6E-04	2.3E-08
2-Methylhexane	591-76-4	1.6E-02	1,800,000	9.1E-09		8.1E-03	4.5E-09	8.1E-03	4.5E-09
2-Methylnaphthalene	91-57-6	7.2E-03	3,000	2.4E-06		3.6E-03	1.2E-06	3.6E-03	1.2E-06
2-Methylpentane	107-83-5	1.1E-02	1,800,000	5.9E-09		5.3E-03	2.9E-09	5.3E-03	2.9E-09
2-Naphthylamine	91-59-8	1.0E-02	320	3.3E-05		5.2E-03	1.6E-05	5.2E-03	1.6E-05
3-Ethyltoluene	620-14-4	4.6E-03	12,000	3.8E-07		2.3E-03	1.9E-07	2.3E-03	1.9E-07
3-Methylheptane	589-81-1	3.4E-03	1,400,000	2.4E-09		1.7E-03	1.2E-09	1.7E-03	1.2E-09
3-Methylhexane	589-34-4	2.1E-02	1,800,000	1.2E-08		1.1E-02	5.9E-09	1.1E-02	5.9E-09
3-Methylpentane	96-14-0	6.8E-03	1,800,000	3.8E-09		3.4E-03	1.9E-09	3.4E-03	1.9E-09
4,6-Dinitro-2-methylphenol	534-52-1	9.2E-03	200	4.6E-05		4.6E-03	2.3E-05	4.6E-03	2.3E-05
4-Aminobyphenyl	92-67-1	1.1E-02	490	2.2E-05		5.3E-03	1.1E-05	5.3E-03	1.1E-05
4-Ethyltoluene	622-96-8	5.1E-03	12,000	4.2E-07		2.5E-03	2.1E-07	2.5E-03	2.1E-07
Acenaphthene	83-32-9	5.3E-04	3,600	1.5E-07		2.6E-04	7.3E-08	2.6E-04	7.3E-08
Acenaphthylene	208-96-8	3.0E-03	10,000	3.0E-07		1.5E-03	1.5E-07	1.5E-03	1.5E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	8.9E-02	470	1.9E-04		4.5E-02	9.5E-05	4.5E-02	9.5E-05
Acetone	67-64-1	2.3E-02	470,000	4.9E-08		1.2E-02	2.4E-08	1.2E-02	2.4E-08
Acetonitrile	75-05-8	1.8E-02	22,000	8.3E-07		9.1E-03	4.1E-07	9.1E-03	4.1E-07
Acetophenone	98-86-2	2.6E-03	10,000	2.6E-07		1.3E-03	1.3E-07	1.3E-03	1.3E-07
Acrylonitrile	107-13-1	1.5E-02	10,000	1.5E-06		7.7E-03	7.7E-07	7.7E-03	7.7E-07
Aluminum	7429-90-5	3.5E+01	3,000	1.2E-02		1.8E+01	5.9E-03	1.8E+01	5.9E-03
Aniline	62-53-3	7.7E-03	30,000	2.6E-07		3.8E-03	1.3E-07	3.8E-03	1.3E-07
Anthracene	120-12-7	1.2E-04	270	4.6E-07		6.2E-05	2.3E-07	6.2E-05	2.3E-07
Antimony	7440-36-0	2.8E-02	500	5.6E-05		1.4E-02	2.8E-05	1.4E-02	2.8E-05
Arsenic	7440-38-2	4.9E-04	0.20	2.4E-03		2.4E-04	1.2E-03	2.4E-04	1.2E-03
Barium	7440-39-3	3.4E-04	1,500	2.3E-07		1.7E-04	1.1E-07	1.7E-04	1.1E-07
Benzaldehyde	100-52-7	3.7E-02	17,000	2.1E-06		1.8E-02	1.1E-06	1.8E-02	1.1E-06
Benzene	71-43-2	1.2E-01	27	4.3E-03		5.8E-02	2.1E-03	5.8E-02	2.1E-03
Benzo(a)anthracene	56-55-3	5.5E-04	1,200	4.6E-07		2.8E-04	2.3E-07	2.8E-04	2.3E-07
Benzo(a)pyrene	50-32-8	7.2E-05	600	1.2E-07		3.6E-05	6.0E-08	3.6E-05	6.0E-08
Benzo(b)fluoranthene	205-99-2	1.1E-03	31	3.6E-05		5.5E-04	1.8E-05	5.5E-04	1.8E-05
Benzo(g,h,i)perylene	191-24-2	4.0E-04	30,000	1.3E-08		2.0E-04	6.7E-09	2.0E-04	6.7E-09
Benzo(k)fluoranthene	207-08-9	1.1E-03	19	5.7E-05		5.4E-04	2.8E-05	5.4E-04	2.8E-05
Benzoic acid	65-85-0	6.0E-02	2,800	2.1E-05		3.0E-02	1.1E-05	3.0E-02	1.1E-05
Benzyl alcohol	100-51-6	7.5E-04	130,000	5.7E-09		3.7E-04	2.9E-09	3.7E-04	2.9E-09
Benzyl chloride	100-44-7	5.5E-04	240	2.3E-06		2.7E-04	1.1E-06	2.7E-04	1.1E-06
Bis(2-chlorethyl)ether	111-44-4	5.9E-04	58,000	1.0E-08		2.9E-04	5.1E-09	2.9E-04	5.1E-09
Bis(2-chloroethoxy)methane	111-91-1	5.3E-04	920	5.7E-07		2.6E-04	2.9E-07	2.6E-04	2.9E-07
Bromodichloromethane	75-27-4	7.5E-04	260	2.9E-06		3.7E-04	1.4E-06	3.7E-04	1.4E-06
Bromoform	75-25-2	1.2E-03	15,000	8.3E-08		6.2E-04	4.2E-08	6.2E-04	4.2E-08
Bromophenyl-phenylether, 4-	101-55-3	5.3E-04	290	1.8E-06		2.6E-04	9.1E-07	2.6E-04	9.1E-07
Butylbenzylphthalate	85-68-7	1.4E-04	15,000	9.6E-09		7.2E-05	4.8E-09	7.2E-05	4.8E-09
Cadmium	7440-43-9	4.2E-05	100	4.2E-07		2.1E-05	2.1E-07	2.1E-05	2.1E-07
Carbazole	86-74-8	6.7E-04	660	1.0E-06		3.4E-04	5.1E-07	3.4E-04	5.1E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	9.4E-03	6,200	1.5E-06		4.7E-03	7.6E-07	4.7E-03	7.6E-07
Carbon tetrachloride	56-23-5	1.4E-02	1,900	7.6E-06		7.2E-03	3.8E-06	7.2E-03	3.8E-06
Chlorine	7782-50-5	1.1E+01	210	5.4E-02		5.7E+00	2.7E-02	5.7E+00	2.7E-02
Chloro-3-methylphenol, 4-	59-50-7	6.5E-04	5,500	1.2E-07		3.3E-04	5.9E-08	3.3E-04	5.9E-08
Chloroacetonitrile	107-14-2	1.1E-03	9,000	1.2E-07		5.3E-04	5.9E-08	5.3E-04	5.9E-08
Chloroaniline, p-	106-47-8	1.5E-04	2,200	6.8E-08		7.4E-05	3.4E-08	7.4E-05	3.4E-08
Chlorobenzene	108-90-7	2.4E-03	46,000	5.2E-08		1.2E-03	2.6E-08	1.2E-03	2.6E-08
Chloroethane	75-00-3	4.2E-04	260,000	1.6E-09		2.1E-04	8.1E-10	2.1E-04	8.1E-10
Chloroform (Trichloromethane)	67-66-3	5.9E-03	150	3.9E-05		2.9E-03	1.9E-05	2.9E-03	1.9E-05
Chloronaphthalene,2-	91-58-7	5.3E-04	600	8.8E-07		2.6E-04	4.4E-07	2.6E-04	4.4E-07
Chlorophenol, 2-	95-57-8	1.8E-03	1,300	1.4E-06		9.2E-04	7.1E-07	9.2E-04	7.1E-07
Chromium III	7440-47-3	9.7E-03	1,500	6.5E-06		4.8E-03	3.2E-06	2.4E-04	1.6E-07
Chromium, hexavalent	18540-29-9	7.9E-03	89	8.9E-05		4.0E-03	4.5E-05	2.0E-04	2.2E-06
Chrysene	218-01-9	6.9E-04	600	1.1E-06		3.4E-04	5.7E-07	3.4E-04	5.7E-07
Cis-1,3-dichloropropene	10062-01-5	1.2E-03	600	2.1E-06		6.2E-04	1.0E-06	6.2E-04	1.0E-06
cis-2-Butene	590-18-1	1.6E-03	150,000,000	1.1E-11		8.1E-04	5.4E-12	8.1E-04	5.4E-12
Cobalt	7440-48-4	1.1E-04	180	5.9E-07		5.3E-05	2.9E-07	5.3E-05	2.9E-07
Copper	7440-50-8	2.2E-02	100	2.2E-04		1.1E-02	1.1E-04	1.1E-02	1.1E-04
Cresol, m-	108-39-4	1.2E-04	20,000	6.2E-09		6.2E-05	3.1E-09	6.2E-05	3.1E-09
Cresol, o-	95-48-7	3.2E-03	20,000	1.6E-07		1.6E-03	7.9E-08	1.6E-03	7.9E-08
Cresol, p-	106-44-5	1.2E-04	20,000	6.2E-09		6.2E-05	3.1E-09	6.2E-05	3.1E-09
Crotonaldehyde	4170-30-3	3.1E-03	540	5.7E-06		1.5E-03	2.8E-06	1.5E-03	2.8E-06
Cumene	98-82-8	4.0E-04	250,000	1.6E-09		2.0E-04	8.1E-10	2.0E-04	8.1E-10
Cyclohexane	110-82-7	2.4E-03	340,000	7.1E-09		1.2E-03	3.5E-09	1.2E-03	3.5E-09
Dibenz(a,h)anthracene	53-70-3	9.5E-05	34	2.8E-06		4.8E-05	1.4E-06	4.8E-05	1.4E-06
Dibenzofuran	132-64-9	5.3E-04	30,000	1.8E-08		2.6E-04	8.8E-09	2.6E-04	8.8E-09
Dibromochloromethane	124-48-1	8.5E-04	7,400	1.1E-07		4.2E-04	5.7E-08	4.2E-04	5.7E-08
Dichlorobenzene, 1,2-	95-50-1	5.4E-04	300,000	1.8E-09		2.7E-04	8.9E-10	2.7E-04	8.9E-10
Dichlorobenzene, 1,3-	541-73-1	6.0E-04	16,000	3.7E-08		3.0E-04	1.9E-08	3.0E-04	1.9E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	5.6E-04	60,000	9.3E-09		2.8E-04	4.6E-09	2.8E-04	4.6E-09
Dichloroethane 1,1-	75-34-3	3.1E-04	650,000	4.7E-10		1.5E-04	2.4E-10	1.5E-04	2.4E-10
Dichloroethane, 1,2	107-06-2	5.2E-04	200,000	2.6E-09		2.6E-04	1.3E-09	2.6E-04	1.3E-09
Dichloroethylene 1,1-	75-35-4	4.1E-04	180,000	2.3E-09		2.1E-04	1.1E-09	2.1E-04	1.1E-09
Dichloroethylene, cis-1,2-	156-59-2	1.2E-04	560,000	2.1E-10		5.8E-05	1.0E-10	5.8E-05	1.0E-10
Dichloroethylene-1,2 (trans)	156-60-5	6.9E-04	1,100,000	6.3E-10		3.5E-04	3.1E-10	3.5E-04	3.1E-10
Dichlorophenol, 2,4-	120-83-2	8.9E-04	1,300	6.8E-07		4.4E-04	3.4E-07	4.4E-04	3.4E-07
Dichloropropane, 1,2-	78-87-5	3.6E-04	140,000	2.5E-09		1.8E-04	1.3E-09	1.8E-04	1.3E-09
Diethyl phthalate	84-66-2	7.7E-04	5,000	1.5E-07		3.8E-04	7.7E-08	3.8E-04	7.7E-08
Dimethyl phthalate	131-11-3	5.3E-04	15,000	3.5E-08		2.6E-04	1.8E-08	2.6E-04	1.8E-08
Dimethylphenol, 2,4-	105-67-9	6.6E-03	4,500	1.5E-06		3.3E-03	7.3E-07	3.3E-03	7.3E-07
Di-n-butyl phthalate	84-74-2	1.1E-02	15,000	7.0E-07		5.3E-03	3.5E-07	5.3E-03	3.5E-07
Dinitrobenzene, 1,3-	99-65-0	5.5E-04	1,000	5.5E-07		2.7E-04	2.7E-07	2.7E-04	2.7E-07
Dinitrophenol, 2,4-	51-28-5	2.3E-02	220	1.1E-04		1.2E-02	5.3E-05	1.2E-02	5.3E-05
Dinitrotoluene, 2,4-	121-14-2	5.3E-04	600	8.8E-07		2.6E-04	4.4E-07	2.6E-04	4.4E-07
Dinitrotoluene, 2,6-	606-20-2	5.4E-04	600	9.0E-07		2.7E-04	4.5E-07	2.7E-04	4.5E-07
Di-n-octylphthalate	117-84-0	3.5E-03	6,800	5.2E-07		1.8E-03	2.6E-07	1.8E-03	2.6E-07
Dioxane, 1,4-	123-91-1	6.1E-04	3,000	2.0E-07		3.1E-04	1.0E-07	3.1E-04	1.0E-07
Diphenylamine	122-39-4	5.3E-04	30,000	1.8E-08		2.6E-04	8.8E-09	2.6E-04	8.8E-09
Ethyl methacrylate	97-63-2	1.5E-03	13,000	1.2E-07		7.7E-04	5.9E-08	7.7E-04	5.9E-08
Ethylbenzene	100-41-4	1.1E-02	140,000	7.5E-08		5.3E-03	3.8E-08	5.3E-03	3.8E-08
Ethylene Dibromide	106-93-4	8.5E-04	130,000	6.6E-09		4.3E-04	3.3E-09	4.3E-04	3.3E-09
Ethylether	60-29-7	2.4E-03	1,500,000	1.6E-09		1.2E-03	8.0E-10	1.2E-03	8.0E-10
Ethylhexyl phthalate, bis-2-	117-81-7	1.1E-03	10,000	1.1E-07		5.5E-04	5.5E-08	5.5E-04	5.5E-08
Fluoranthene	206-44-0	2.5E-03	1,500	1.7E-06		1.3E-03	8.4E-07	1.3E-03	8.4E-07
Fluorene	86-73-7	6.3E-04	6,600	9.5E-08		3.1E-04	4.7E-08	3.1E-04	4.7E-08
Formaldehyde	50-00-0	4.5E-02	55	8.2E-04		2.3E-02	4.1E-04	2.3E-02	4.1E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	2.7E-08	3	9.0E-09		1.4E-08	4.5E-09	1.4E-08	4.5E-09
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	6.8E-07	45	1.5E-08		3.4E-07	7.6E-09	3.4E-07	7.6E-09

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	1.8E-07	60	3.0E-09		8.9E-08	1.5E-09	8.9E-08	1.5E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	3.3E-09	0.07	4.4E-08		1.6E-09	2.2E-08	1.6E-09	2.2E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	8.3E-09	0.75	1.1E-08		4.2E-09	5.5E-09	4.2E-09	5.5E-09
HexaCDD, 1,2,3,7,8,9-	19408-74-3	5.7E-09	4	1.5E-09		2.8E-09	7.3E-10	2.8E-09	7.3E-10
HexaCDF, 1,2,3,4,7,8-	70648-26-9	2.4E-07	0.07	3.3E-06		1.2E-07	1.6E-06	1.2E-07	1.6E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	1.5E-07	0.04	4.0E-06		7.5E-08	2.0E-06	7.5E-08	2.0E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	1.1E-07	30	3.7E-09		5.6E-08	1.9E-09	5.6E-08	1.9E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	1.8E-07	0.49	3.6E-07		8.9E-08	1.8E-07	8.9E-08	1.8E-07
Hexachloro-1,3-butadiene	87-68-3	7.8E-04	11,000	7.1E-08		3.9E-04	3.5E-08	3.9E-04	3.5E-08
Hexachlorobenzene	118-74-1	4.5E-03	6	7.5E-04		2.2E-03	3.7E-04	2.2E-03	3.7E-04
Hexachlorocyclopentadiene	77-47-4	1.1E-02	110	9.6E-05		5.3E-03	4.8E-05	5.3E-03	4.8E-05
Hexachloroethane (Perchloroethane)	67-72-1	5.7E-04	29,000	2.0E-08		2.8E-04	9.8E-09	2.8E-04	9.8E-09
Hexachloropropene	1888-71-7	7.6E-04	905	8.4E-07		3.8E-04	4.2E-07	3.8E-04	4.2E-07
Hexane	110-54-3	9.4E-03	1,100,000	8.6E-09		4.7E-03	4.3E-09	4.7E-03	4.3E-09
Hydrogen chloride	7647-01-0	1.7E+01	2,100	8.1E-03		8.5E+00	4.1E-03	8.5E+00	4.1E-03
Indeno(1,2,3-cd) pyrene	193-39-5	3.5E-04	15	2.3E-05		1.8E-04	1.2E-05	1.8E-04	1.2E-05
Isophorone	78-59-1	5.3E-04	23,000	2.3E-08		2.6E-04	1.1E-08	2.6E-04	1.1E-08
Lead	7439-92-1	3.6E-02	150	2.4E-04		1.8E-02	1.2E-04	1.8E-02	1.2E-04
Manganese	7439-96-5	8.3E-02	3,000	2.8E-05		4.1E-02	1.4E-05	4.1E-02	1.4E-05
Mercuric chloride	7487-94-7	5.0E-06	2,700	1.8E-09		2.5E-06	9.2E-10	2.5E-06	9.2E-10
Methacrylonitrile	126-98-7	5.7E-03	2,700	2.1E-06		2.8E-03	1.0E-06	2.8E-03	1.0E-06
Methyl bromide	74-83-9	1.2E-04	3,900	3.0E-08		5.8E-05	1.5E-08	5.8E-05	1.5E-08
Methyl chloride	74-87-3	1.3E-02	210,000	6.4E-08		6.7E-03	3.2E-08	6.7E-03	3.2E-08
Methyl ethyl ketone	78-93-3	3.7E-03	13,000	2.9E-07		1.9E-03	1.4E-07	1.9E-03	1.4E-07
Methyl isobutyl ketone	108-10-1	7.9E-04	310,000	2.5E-09		3.9E-04	1.3E-09	3.9E-04	1.3E-09
Methyl tert-butyl ether	1634-04-4	1.2E-02	180,000	6.9E-08		6.2E-03	3.5E-08	6.2E-03	3.5E-08
Methylcyclohexane	108-87-2	1.2E-02	1,600,000	7.2E-09		5.8E-03	3.6E-09	5.8E-03	3.6E-09
Methylene chloride	75-09-2	2.3E-01	14,000	1.6E-05		1.2E-01	8.2E-06	1.2E-01	8.2E-06
Methylmethacrylate	80-62-6	1.5E-03	70,000	2.2E-08		7.7E-04	1.1E-08	7.7E-04	1.1E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	8.8E-02	79,000	1.1E-06		4.4E-02	5.6E-07	4.4E-02	5.6E-07
Nickel	7440-02-0	5.1E-02	0.20	2.6E-01		2.6E-02	1.3E-01	4.4E-04	2.2E-03
Nitroaniline, 2-	88-74-4	5.3E-04	4,800	1.1E-07		2.6E-04	5.5E-08	2.6E-04	5.5E-08
Nitroaniline, 3-	99-09-2	2.1E-03	110	1.9E-05		1.0E-03	9.5E-06	1.0E-03	9.5E-06
Nitroaniline, 4-	100-01-6	2.1E-03	9,000	2.3E-07		1.0E-03	1.2E-07	1.0E-03	1.2E-07
Nitrobenzene	98-95-3	6.0E-04	9,100	6.6E-08		3.0E-04	3.3E-08	3.0E-04	3.3E-08
Nitrophenol, 2-	88-75-5	4.5E-03	1,000	4.5E-06		2.3E-03	2.3E-06	2.3E-03	2.3E-06
Nitrophenol, 4-	100-02-7	3.5E-03	1,200	2.9E-06		1.7E-03	1.4E-06	1.7E-03	1.4E-06
Nitroso-di-n-butylamine, n-	924-16-3	5.3E-04	2,000	2.6E-07		2.6E-04	1.3E-07	2.6E-04	1.3E-07
Nitrosodiphenylamine, N-	86-30-6	9.4E-05	1,400	6.7E-08		4.7E-05	3.3E-08	4.7E-05	3.3E-08
Nitrosodipropylamine, n-	621-64-7	5.3E-04	2,000	2.6E-07		2.6E-04	1.3E-07	2.6E-04	1.3E-07
n-Nitrosodiethylamine	55-18-5	5.3E-04	1,700	3.1E-07		2.6E-04	1.5E-07	2.6E-04	1.5E-07
n-Nitrosodimethylamine	62-75-9	5.4E-04	1,700	3.2E-07		2.7E-04	1.6E-07	2.7E-04	1.6E-07
n-Nitrosomethylethylamine	10595-95-6	8.7E-04	1,700	5.1E-07		4.4E-04	2.6E-07	4.4E-04	2.6E-07
n-Nitrosomorpholine	59-89-2	5.3E-04	74	7.1E-06		2.6E-04	3.5E-06	2.6E-04	3.5E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	3.5E-08	3	1.2E-08		1.7E-08	5.8E-09	1.7E-08	5.8E-09
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	5.0E-07	75	6.6E-09		2.5E-07	3.3E-09	2.5E-07	3.3E-09
o-Tolualdehyde	529-20-4	3.8E-02	17,000	2.3E-06		1.9E-02	1.1E-06	1.9E-02	1.1E-06
p-Dimethylaminoazobenzene	60-11-7	5.1E-04	670	7.7E-07		2.6E-04	3.8E-07	2.6E-04	3.8E-07
PentaCDD, 1,2,3,7,8-	40321-76-4	6.3E-09	0.10	6.3E-08		3.1E-09	3.1E-08	3.1E-09	3.1E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	7.5E-08	0.24	3.1E-07		3.8E-08	1.6E-07	3.8E-08	1.6E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	1.5E-07	0.07	2.0E-06		7.5E-08	1.0E-06	7.5E-08	1.0E-06
Pentachlorobenzene	608-93-5	5.3E-04	1,600	3.3E-07		2.6E-04	1.6E-07	2.6E-04	1.6E-07
Pentachloroethane	76-01-7	6.7E-04	320,000	2.1E-09		3.3E-04	1.0E-09	3.3E-04	1.0E-09
Pentachloronitrobenzene	82-68-8	5.6E-04	1,500	3.7E-07		2.8E-04	1.9E-07	2.8E-04	1.9E-07
Pentachlorophenol	87-86-5	2.6E-02	1,400	1.9E-05		1.3E-02	9.4E-06	1.3E-02	9.4E-06
Perchlorate	14797-73-0	4.6E-04	23	2.0E-05		2.3E-04	9.9E-06	2.3E-04	9.9E-06
Phenanthrene	85-01-8	3.0E-03	760	4.0E-06		1.5E-03	2.0E-06	1.5E-03	2.0E-06
Phenol	108-95-2	2.9E-03	5,800	4.9E-07		1.4E-03	2.5E-07	1.4E-03	2.5E-07

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	9.7E-02	270	3.6E-04		4.8E-02	1.8E-04	4.8E-02	1.8E-04
Propanal	123-38-6	5.0E-02	110,000	4.5E-07		2.5E-02	2.3E-07	2.5E-02	2.3E-07
Propylbenzene	103-65-1	4.4E-03	5,400	8.2E-07		2.2E-03	4.1E-07	2.2E-03	4.1E-07
Propylene	115-07-1	4.7E-02	860,000	5.5E-08		2.3E-02	2.7E-08	2.3E-02	2.7E-08
Pyrene	129-00-0	2.2E-03	150	1.4E-05		1.1E-03	7.2E-06	1.1E-03	7.2E-06
Pyridine	110-86-1	7.8E-04	9,700	8.0E-08		3.9E-04	4.0E-08	3.9E-04	4.0E-08
Selenium	7782-49-2	1.4E-03	200	7.1E-06		7.0E-04	3.5E-06	7.0E-04	3.5E-06
Silver	7440-22-4	1.1E-03	100	1.1E-05		5.3E-04	5.3E-06	5.3E-04	5.3E-06
Styrene	100-42-5	1.2E-03	21,000	5.9E-08		6.2E-04	3.0E-08	6.2E-04	3.0E-08
TetraCDD, 2,3,7,8-	1746-01-6	2.2E-09	0.00003	7.3E-05		1.1E-09	3.6E-05	1.1E-09	3.6E-05
TetraCDF, 2,3,7,8-	51207-31-9	3.8E-08	0.07	5.2E-07		1.9E-08	2.6E-07	1.9E-08	2.6E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	5.3E-04	240	2.2E-06		2.6E-04	1.1E-06	2.6E-04	1.1E-06
Tetrachloroethane, 1,1,2,2-	79-34-5	4.0E-04	7,000	5.8E-08		2.0E-04	2.9E-08	2.0E-04	2.9E-08
Tetrachloroethylene	127-18-4	2.4E-03	20,000	1.2E-07		1.2E-03	6.0E-08	1.2E-03	6.0E-08
Tetrachlorophenol, 2,3,4,6-	58-90-2	6.8E-04	1,300	5.3E-07		3.4E-04	2.6E-07	3.4E-04	2.6E-07
Tetrahydrofuran	109-99-9	8.6E-04	290,000	3.0E-09		4.3E-04	1.5E-09	4.3E-04	1.5E-09
Toluene	108-88-3	2.7E-02	37,000	7.3E-07		1.3E-02	3.6E-07	1.3E-02	3.6E-07
Toluidine, o-	95-53-4	6.7E-03	8,800	7.7E-07		3.4E-03	3.8E-07	3.4E-03	3.8E-07
Trans-1,3-dichloropropene	10061-02-6	5.9E-04	75,000	7.8E-09		2.9E-04	3.9E-09	2.9E-04	3.9E-09
trans-2-Butene	624-64-6	7.4E-03	1,000,000	7.4E-09		3.7E-03	3.7E-09	3.7E-03	3.7E-09
Trichlorobenzene, 1,2,4-	120-82-1	6.2E-04	3,400	1.8E-07		3.1E-04	9.1E-08	3.1E-04	9.1E-08
Trichloroethane, 1,1,1-	71-55-6	2.6E-04	1,300,000	2.0E-10		1.3E-04	1.0E-10	1.3E-04	1.0E-10
Trichloroethane, 1,1,2-	79-00-5	7.0E-04	81,000	8.7E-09		3.5E-04	4.3E-09	3.5E-04	4.3E-09
Trichloroethylene	79-01-6	9.0E-04	700,000	1.3E-09		4.5E-04	6.4E-10	4.5E-04	6.4E-10
Trichlorophenol, 2,4,5-	95-95-4	1.4E-03	7,400	1.8E-07		6.8E-04	9.2E-08	6.8E-04	9.2E-08
Trichlorophenol, 2,4,6-	88-06-2	1.3E-03	1,800	7.0E-07		6.3E-04	3.5E-07	6.3E-04	3.5E-07
Trimethylbenzene, 1,3,5-	108-67-8	1.8E-02	690,000	2.6E-08		9.1E-03	1.3E-08	9.1E-03	1.3E-08
Trinitrobenzene, 1,3,5	99-35-4	5.3E-04	530	9.9E-07		2.6E-04	5.0E-07	2.6E-04	5.0E-07
Undecane	1120-21-4	1.2E-02	1,500	7.7E-06		5.8E-03	3.8E-06	5.8E-03	3.8E-06

Source M-136 A and M-225 A, Acute HQs and HI for Thatcher, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	7.3E-03	180,000	4.1E-08		3.6E-03	2.0E-08	3.6E-03	2.0E-08
Xylene, m-	108-38-3	1.1E-02	22,000	4.8E-07		5.3E-03	2.4E-07	5.3E-03	2.4E-07
Xylene, o-	95-47-6	1.2E-02	22,000	5.7E-07		6.2E-03	2.8E-07	6.2E-03	2.8E-07
Xylene, p-	106-42-3	1.1E-02	22,000	4.8E-07		5.3E-03	2.4E-07	5.3E-03	2.4E-07
Zinc	7440-66-6	4.9E-02	1,900	2.6E-05		2.5E-02	1.3E-05	2.5E-02	1.3E-05
Chromium adjustment factor	**0.05**		**Total**	**0.3**		**Total**	**0.2**	**With adjusted Ni & Cr**	**4.4E-02**
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	1.1E-03	690,000	1.6E-09		5.4E-04	7.9E-10	5.4E-04	7.9E-10
1,2,4-Trimethylbenzene	95-63-6	6.5E-02	690,000	9.4E-08		3.2E-02	4.7E-08	3.2E-02	4.7E-08
1,4-Diethylbenzene	105-05-5	1.7E-03	12,000	1.4E-07		8.7E-04	7.2E-08	8.7E-04	7.2E-08
1-Butene	106-98-9	5.7E-02	1,200,000	4.8E-08		2.8E-02	2.4E-08	2.8E-02	2.4E-08
1-Chloronapthalene	90-13-1	1.4E-03	4,600	3.1E-07		7.1E-04	1.5E-07	7.1E-04	1.5E-07
1-Naphthylamine	134-32-7	2.9E-02	210	1.4E-04		1.4E-02	6.8E-05	1.4E-02	6.8E-05
2,2,4-Trimethylpentane	540-84-1	6.2E-02	14,000,000	4.4E-09		3.1E-02	2.2E-09	3.1E-02	2.2E-09
2,2-Dimethylbutane	75-83-2	3.6E-03	1,800,000	2.0E-09		1.8E-03	1.0E-09	1.8E-03	1.0E-09
2,3,4-Trimethylpentane	565-75-3	2.1E-02	14,000,000	1.5E-09		1.1E-02	7.6E-10	1.1E-02	7.6E-10
2,3-Dimethylbutane	79-29-8	9.1E-03	1,800,000	5.0E-09		4.5E-03	2.5E-09	4.5E-03	2.5E-09
2,3-Dimethylpentane	565-59-3	3.6E-02	1,800,000	2.0E-08		1.8E-02	1.0E-08	1.8E-02	1.0E-08
2,4-Dimethylpentane	108-08-7	1.3E-02	180,000	7.5E-08		6.7E-03	3.7E-08	6.7E-03	3.7E-08
2,5-Dimethylbenzaldehyde	5779-94-2	7.0E-02	17,000	4.1E-06		3.5E-02	2.1E-06	3.5E-02	2.1E-06
2,6-Dichlorophenol	87-65-0	1.4E-03	8,800	1.6E-07		7.1E-04	8.1E-08	7.1E-04	8.1E-08
2-Ethyltoluene	611-14-3	1.2E-03	12,000	9.7E-08		5.8E-04	4.9E-08	5.8E-04	4.9E-08
2-Hexanone	591-78-6	5.2E-03	41,000	1.3E-07		2.6E-03	6.3E-08	2.6E-03	6.3E-08
2-Methylhexane	591-76-4	4.4E-02	1,800,000	2.5E-08		2.2E-02	1.2E-08	2.2E-02	1.2E-08
2-Methylnaphthalene	91-57-6	1.9E-02	3,000	6.5E-06		9.7E-03	3.2E-06	9.7E-03	3.2E-06
2-Methylpentane	107-83-5	2.9E-02	1,800,000	1.6E-08		1.4E-02	7.9E-09	1.4E-02	7.9E-09
2-Naphthylamine	91-59-8	2.9E-02	320	8.9E-05		1.4E-02	4.4E-05	1.4E-02	4.4E-05
3-Ethyltoluene	620-14-4	1.2E-02	12,000	1.0E-06		6.2E-03	5.2E-07	6.2E-03	5.2E-07
3-Methylheptane	589-81-1	9.1E-03	1,400,000	6.5E-09		4.5E-03	3.2E-09	4.5E-03	3.2E-09
3-Methylhexane	589-34-4	5.7E-02	1,800,000	3.2E-08		2.8E-02	1.6E-08	2.8E-02	1.6E-08
3-Methylpentane	96-14-0	1.8E-02	1,800,000	1.0E-08		9.2E-03	5.1E-09	9.2E-03	5.1E-09
4,6-Dinitro-2-methylphenol	534-52-1	2.5E-02	200	1.2E-04		1.2E-02	6.2E-05	1.2E-02	6.2E-05
4-Aminobyphenyl	92-67-1	2.9E-02	490	5.8E-05		1.4E-02	2.9E-05	1.4E-02	2.9E-05
4-Ethyltoluene	622-96-8	1.4E-02	12,000	1.1E-06		6.9E-03	5.7E-07	6.9E-03	5.7E-07
Acenaphthene	83-32-9	1.4E-03	3,600	4.0E-07		7.1E-04	2.0E-07	7.1E-04	2.0E-07
Acenaphthylene	208-96-8	8.0E-03	10,000	8.0E-07		4.0E-03	4.0E-07	4.0E-03	4.0E-07

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Acetaldehyde	75-07-0	2.4E-01	470	5.1E-04		1.2E-01	2.6E-04	1.2E-01	2.6E-04
Acetone	67-64-1	6.2E-02	470,000	1.3E-07		3.1E-02	6.6E-08	3.1E-02	6.6E-08
Acetonitrile	75-05-8	4.9E-02	22,000	2.2E-06		2.5E-02	1.1E-06	2.5E-02	1.1E-06
Acetophenone	98-86-2	7.0E-03	10,000	7.0E-07		3.5E-03	3.5E-07	3.5E-03	3.5E-07
Acrylonitrile	107-13-1	4.2E-02	10,000	4.2E-06		2.1E-02	2.1E-06	2.1E-02	2.1E-06
Aluminum	7429-90-5	9.9E+01	3,000	3.3E-02		4.9E+01	1.6E-02	4.9E+01	1.6E-02
Aniline	62-53-3	2.1E-02	30,000	6.9E-07		1.0E-02	3.5E-07	1.0E-02	3.5E-07
Anthracene	120-12-7	3.4E-04	270	1.2E-06		1.7E-04	6.2E-07	1.7E-04	6.2E-07
Antimony	7440-36-0	7.5E-02	500	1.5E-04		3.8E-02	7.5E-05	3.8E-02	7.5E-05
Arsenic	7440-38-2	1.4E-03	0.20	6.8E-03		6.8E-04	3.4E-03	6.8E-04	3.4E-03
Barium	7440-39-3	9.7E-04	1,500	6.4E-07		4.8E-04	3.2E-07	4.8E-04	3.2E-07
Benzaldehyde	100-52-7	9.9E-02	17,000	5.8E-06		4.9E-02	2.9E-06	4.9E-02	2.9E-06
Benzene	71-43-2	3.1E-01	27	1.2E-02		1.6E-01	5.8E-03	1.6E-01	5.8E-03
Benzo(a)anthracene	56-55-3	1.5E-03	1,200	1.3E-06		7.6E-04	6.3E-07	7.6E-04	6.3E-07
Benzo(a)pyrene	50-32-8	2.0E-04	600	3.3E-07		9.9E-05	1.7E-07	9.9E-05	1.7E-07
Benzo(b)fluoranthene	205-99-2	3.0E-03	31	9.6E-05		1.5E-03	4.8E-05	1.5E-03	4.8E-05
Benzo(g,h,i)perylene	191-24-2	1.1E-03	30,000	3.8E-08		5.6E-04	1.9E-08	5.6E-04	1.9E-08
Benzo(k)fluoranthene	207-08-9	3.0E-03	19	1.6E-04		1.5E-03	7.8E-05	1.5E-03	7.8E-05
Benzoic acid	65-85-0	1.6E-01	2,800	5.8E-05		8.1E-02	2.9E-05	8.1E-02	2.9E-05
Benzyl alcohol	100-51-6	2.0E-03	130,000	1.6E-08		1.0E-03	7.7E-09	1.0E-03	7.7E-09
Benzyl chloride	100-44-7	1.5E-03	240	6.2E-06		7.4E-04	3.1E-06	7.4E-04	3.1E-06
Bis(2-chlorethyl)ether	111-44-4	1.6E-03	58,000	2.7E-08		7.9E-04	1.4E-08	7.9E-04	1.4E-08
Bis(2-chloroethoxy)methane	111-91-1	1.4E-03	920	1.5E-06		7.1E-04	7.7E-07	7.1E-04	7.7E-07
Bromodichloromethane	75-27-4	2.0E-03	260	7.8E-06		1.0E-03	3.9E-06	1.0E-03	3.9E-06
Bromoform	75-25-2	3.4E-03	15,000	2.2E-07		1.7E-03	1.1E-07	1.7E-03	1.1E-07
Bromophenyl-phenylether, 4-	101-55-3	1.4E-03	290	4.9E-06		7.1E-04	2.4E-06	7.1E-04	2.4E-06
Butylbenzylphthalate	85-68-7	3.9E-04	15,000	2.6E-08		1.9E-04	1.3E-08	1.9E-04	1.3E-08
Cadmium	7440-43-9	1.2E-04	100	1.2E-06		5.8E-05	5.8E-07	5.8E-05	5.8E-07
Carbazole	86-74-8	1.8E-03	660	2.8E-06		9.1E-04	1.4E-06	9.1E-04	1.4E-06

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Carbon disulfide	75-15-0	2.5E-02	6,200	4.1E-06		1.3E-02	2.0E-06	1.3E-02	2.0E-06
Carbon tetrachloride	56-23-5	3.9E-02	1,900	2.0E-05		1.9E-02	1.0E-05	1.9E-02	1.0E-05
Chlorine	7782-50-5	3.1E+01	210	1.5E-01		1.5E+01	7.3E-02	1.5E+01	7.3E-02
Chloro-3-methylphenol, 4-	59-50-7	1.8E-03	5,500	3.2E-07		8.8E-04	1.6E-07	8.8E-04	1.6E-07
Chloroacetonitrile	107-14-2	2.9E-03	9,000	3.2E-07		1.4E-03	1.6E-07	1.4E-03	1.6E-07
Chloroaniline, p-	106-47-8	4.0E-04	2,200	1.8E-07		2.0E-04	9.1E-08	2.0E-04	9.1E-08
Chlorobenzene	108-90-7	6.5E-03	46,000	1.4E-07		3.2E-03	7.0E-08	3.2E-03	7.0E-08
Chloroethane	75-00-3	1.1E-03	260,000	4.4E-09		5.7E-04	2.2E-09	5.7E-04	2.2E-09
Chloroform (Trichloromethane)	67-66-3	1.6E-02	150	1.1E-04		7.9E-03	5.3E-05	7.9E-03	5.3E-05
Chloronaphthalene,2-	91-58-7	1.4E-03	600	2.4E-06		7.1E-04	1.2E-06	7.1E-04	1.2E-06
Chlorophenol, 2-	95-57-8	5.0E-03	1,300	3.8E-06		2.5E-03	1.9E-06	2.5E-03	1.9E-06
Chromium III	7440-47-3	2.7E-02	1,500	1.8E-05		1.4E-02	9.1E-06	6.8E-04	4.5E-07
Chromium, hexavalent	18540-29-9	2.2E-02	89	2.5E-04		1.1E-02	1.3E-04	5.6E-04	6.3E-06
Chrysene	218-01-9	1.9E-03	600	3.1E-06		9.4E-04	1.6E-06	9.4E-04	1.6E-06
Cis-1,3-dichloropropene	10062-01-5	3.4E-03	600	5.6E-06		1.7E-03	2.8E-06	1.7E-03	2.8E-06
cis-2-Butene	590-18-1	4.4E-03	150,000,000	2.9E-11		2.2E-03	1.5E-11	2.2E-03	1.5E-11
Cobalt	7440-48-4	3.0E-04	180	1.7E-06		1.5E-04	8.2E-07	1.5E-04	8.2E-07
Copper	7440-50-8	6.2E-02	100	6.2E-04		3.1E-02	3.1E-04	3.1E-02	3.1E-04
Cresol, m-	108-39-4	3.3E-04	20,000	1.7E-08		1.7E-04	8.3E-09	1.7E-04	8.3E-09
Cresol, o-	95-48-7	8.5E-03	20,000	4.3E-07		4.3E-03	2.1E-07	4.3E-03	2.1E-07
Cresol, p-	106-44-5	3.3E-04	20,000	1.7E-08		1.7E-04	8.3E-09	1.7E-04	8.3E-09
Crotonaldehyde	4170-30-3	8.3E-03	540	1.5E-05		4.1E-03	7.7E-06	4.1E-03	7.7E-06
Cumene	98-82-8	1.1E-03	250,000	4.4E-09		5.4E-04	2.2E-09	5.4E-04	2.2E-09
Cyclohexane	110-82-7	6.5E-03	340,000	1.9E-08		3.2E-03	9.5E-09	3.2E-03	9.5E-09
Dibenz(a,h)anthracene	53-70-3	2.6E-04	34	7.7E-06		1.3E-04	3.9E-06	1.3E-04	3.9E-06
Dibenzofuran	132-64-9	1.4E-03	30,000	4.7E-08		7.1E-04	2.4E-08	7.1E-04	2.4E-08
Dibromochloromethane	124-48-1	2.3E-03	7,400	3.1E-07		1.1E-03	1.5E-07	1.1E-03	1.5E-07
Dichlorobenzene, 1,2-	95-50-1	1.5E-03	300,000	4.8E-09		7.2E-04	2.4E-09	7.2E-04	2.4E-09
Dichlorobenzene, 1,3-	541-73-1	1.6E-03	16,000	1.0E-07		8.1E-04	5.1E-08	8.1E-04	5.1E-08

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Dichlorobenzene,1,4-	106-46-7	1.5E-03	60,000	2.5E-08		7.5E-04	1.3E-08	7.5E-04	1.3E-08
Dichloroethane 1,1-	75-34-3	8.3E-04	650,000	1.3E-09		4.1E-04	6.4E-10	4.1E-04	6.4E-10
Dichloroethane, 1,2	107-06-2	1.4E-03	200,000	7.0E-09		7.0E-04	3.5E-09	7.0E-04	3.5E-09
Dichloroethylene 1,1-	75-35-4	1.1E-03	180,000	6.2E-09		5.6E-04	3.1E-09	5.6E-04	3.1E-09
Dichloroethylene, cis-1,2-	156-59-2	3.1E-04	560,000	5.6E-10		1.6E-04	2.8E-10	1.6E-04	2.8E-10
Dichloroethylene-1,2 (trans)	156-60-5	1.9E-03	1,100,000	1.7E-09		9.3E-04	8.5E-10	9.3E-04	8.5E-10
Dichlorophenol, 2,4-	120-83-2	2.4E-03	1,300	1.8E-06		1.2E-03	9.2E-07	1.2E-03	9.2E-07
Dichloropropane, 1,2-	78-87-5	9.6E-04	140,000	6.9E-09		4.8E-04	3.4E-09	4.8E-04	3.4E-09
Diethyl phthalate	84-66-2	2.1E-03	5,000	4.2E-07		1.0E-03	2.1E-07	1.0E-03	2.1E-07
Dimethyl phthalate	131-11-3	1.4E-03	15,000	9.5E-08		7.1E-04	4.7E-08	7.1E-04	4.7E-08
Dimethylphenol, 2,4-	105-67-9	1.8E-02	4,500	4.0E-06		8.9E-03	2.0E-06	8.9E-03	2.0E-06
Di-n-butyl phthalate	84-74-2	2.9E-02	15,000	1.9E-06		1.4E-02	9.5E-07	1.4E-02	9.5E-07
Dinitrobenzene, 1,3-	99-65-0	1.5E-03	1,000	1.5E-06		7.4E-04	7.4E-07	7.4E-04	7.4E-07
Dinitrophenol, 2,4-	51-28-5	6.3E-02	220	2.8E-04		3.1E-02	1.4E-04	3.1E-02	1.4E-04
Dinitrotoluene, 2,4-	121-14-2	1.4E-03	600	2.4E-06		7.1E-04	1.2E-06	7.1E-04	1.2E-06
Dinitrotoluene, 2,6-	606-20-2	1.5E-03	600	2.4E-06		7.3E-04	1.2E-06	7.3E-04	1.2E-06
Di-n-octylphthalate	117-84-0	9.6E-03	6,800	1.4E-06		4.8E-03	7.0E-07	4.8E-03	7.0E-07
Dioxane, 1,4-	123-91-1	1.7E-03	3,000	5.5E-07		8.3E-04	2.8E-07	8.3E-04	2.8E-07
Diphenylamine	122-39-4	1.4E-03	30,000	4.7E-08		7.1E-04	2.4E-08	7.1E-04	2.4E-08
Ethyl methacrylate	97-63-2	4.2E-03	13,000	3.2E-07		2.1E-03	1.6E-07	2.1E-03	1.6E-07
Ethylbenzene	100-41-4	2.9E-02	140,000	2.0E-07		1.4E-02	1.0E-07	1.4E-02	1.0E-07
Ethylene Dibromide	106-93-4	2.3E-03	130,000	1.8E-08		1.2E-03	8.9E-09	1.2E-03	8.9E-09
Ethylether	60-29-7	6.5E-03	1,500,000	4.3E-09		3.2E-03	2.2E-09	3.2E-03	2.2E-09
Ethylhexyl phthalate, bis-2-	117-81-7	3.0E-03	10,000	3.0E-07		1.5E-03	1.5E-07	1.5E-03	1.5E-07
Fluoranthene	206-44-0	6.8E-03	1,500	4.5E-06		3.4E-03	2.3E-06	3.4E-03	2.3E-06
Fluorene	86-73-7	1.7E-03	6,600	2.6E-07		8.5E-04	1.3E-07	8.5E-04	1.3E-07
Formaldehyde	50-00-0	1.2E-01	55	2.2E-03		6.1E-02	1.1E-03	6.1E-02	1.1E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	7.5E-08	3	2.5E-08		3.7E-08	1.2E-08	3.7E-08	1.2E-08
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.9E-06	45	4.2E-08		9.4E-07	2.1E-08	9.4E-07	2.1E-08

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	4.9E-07	60	8.2E-09		2.4E-07	4.1E-09	2.4E-07	4.1E-09
HexaCDD, 1,2,3,4,7,8-	39227-28-6	9.0E-09	0.07	1.2E-07		4.5E-09	6.1E-08	4.5E-09	6.1E-08
HexaCDD, 1,2,3,6,7,8-	57653-85-7	2.3E-08	0.75	3.1E-08		1.1E-08	1.5E-08	1.1E-08	1.5E-08
HexaCDD, 1,2,3,7,8,9-	19408-74-3	1.6E-08	4	4.0E-09		7.9E-09	2.0E-09	7.9E-09	2.0E-09
HexaCDF, 1,2,3,4,7,8-	70648-26-9	6.7E-07	0.07	9.1E-06		3.4E-07	4.5E-06	3.4E-07	4.5E-06
HexaCDF, 1,2,3,6,7,8-	57117-44-9	4.1E-07	0.04	1.1E-05		2.1E-07	5.6E-06	2.1E-07	5.6E-06
HexaCDF, 1,2,3,7,8,9-	72918-21-9	3.1E-07	30	1.0E-08		1.5E-07	5.2E-09	1.5E-07	5.2E-09
HexaCDF, 2,3,4,6,7,8-	60851-34-5	4.9E-07	0.49	1.0E-06		2.4E-07	5.0E-07	2.4E-07	5.0E-07
Hexachloro-1,3-butadiene	87-68-3	2.1E-03	11,000	1.9E-07		1.1E-03	9.5E-08	1.1E-03	9.5E-08
Hexachlorobenzene	118-74-1	1.2E-02	6	2.0E-03		6.0E-03	1.0E-03	6.0E-03	1.0E-03
Hexachlorocyclopentadiene	77-47-4	2.9E-02	110	2.6E-04		1.4E-02	1.3E-04	1.4E-02	1.3E-04
Hexachloroethane (Perchloroethane)	67-72-1	1.5E-03	29,000	5.3E-08		7.7E-04	2.6E-08	7.7E-04	2.6E-08
Hexachloropropene	1888-71-7	2.0E-03	905	2.3E-06		1.0E-03	1.1E-06	1.0E-03	1.1E-06
Hexane	110-54-3	2.5E-02	1,100,000	2.3E-08		1.3E-02	1.2E-08	1.3E-02	1.2E-08
Hydrogen chloride	7647-01-0	4.6E+01	2,100	2.2E-02		2.3E+01	1.1E-02	2.3E+01	1.1E-02
Indeno(1,2,3-cd) pyrene	193-39-5	9.9E-04	15	6.6E-05		4.9E-04	3.3E-05	4.9E-04	3.3E-05
Isophorone	78-59-1	1.4E-03	23,000	6.2E-08		7.1E-04	3.1E-08	7.1E-04	3.1E-08
Lead	7439-92-1	1.0E-01	150	6.8E-04		5.1E-02	3.4E-04	5.1E-02	3.4E-04
Manganese	7439-96-5	2.3E-01	3,000	7.8E-05		1.2E-01	3.9E-05	1.2E-01	3.9E-05
Mercuric chloride	7487-94-7	1.4E-05	2,700	5.1E-09		6.9E-06	2.5E-09	6.9E-06	2.5E-09
Methacrylonitrile	126-98-7	1.5E-02	2,700	5.7E-06		7.6E-03	2.8E-06	7.6E-03	2.8E-06
Methyl bromide	74-83-9	3.1E-04	3,900	8.0E-08		1.6E-04	4.0E-08	1.6E-04	4.0E-08
Methyl chloride	74-87-3	3.6E-02	210,000	1.7E-07		1.8E-02	8.6E-08	1.8E-02	8.6E-08
Methyl ethyl ketone	78-93-3	1.0E-02	13,000	7.8E-07		5.0E-03	3.9E-07	5.0E-03	3.9E-07
Methyl isobutyl ketone	108-10-1	2.1E-03	310,000	6.9E-09		1.1E-03	3.4E-09	1.1E-03	3.4E-09
Methyl tert-butyl ether	1634-04-4	3.4E-02	180,000	1.9E-07		1.7E-02	9.4E-08	1.7E-02	9.4E-08
Methylcyclohexane	108-87-2	3.1E-02	1,600,000	1.9E-08		1.6E-02	9.7E-09	1.6E-02	9.7E-09
Methylene chloride	75-09-2	6.2E-01	14,000	4.4E-05		3.1E-01	2.2E-05	3.1E-01	2.2E-05
Methylmethacrylate	80-62-6	4.2E-03	70,000	5.9E-08		2.1E-03	3.0E-08	2.1E-03	3.0E-08

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Naphthalene	91-20-3	2.4E-01	79,000	3.0E-06		1.2E-01	1.5E-06	1.2E-01	1.5E-06
Nickel	7440-02-0	1.4E-01	0.20	7.2E-01		7.2E-02	3.6E-01	1.2E-03	6.2E-03
Nitroaniline, 2-	88-74-4	1.4E-03	4,800	3.0E-07		7.1E-04	1.5E-07	7.1E-04	1.5E-07
Nitroaniline, 3-	99-09-2	5.7E-03	110	5.2E-05		2.8E-03	2.6E-05	2.8E-03	2.6E-05
Nitroaniline, 4-	100-01-6	5.7E-03	9,000	6.3E-07		2.8E-03	3.2E-07	2.8E-03	3.2E-07
Nitrobenzene	98-95-3	1.6E-03	9,100	1.8E-07		8.1E-04	8.9E-08	8.1E-04	8.9E-08
Nitrophenol, 2-	88-75-5	1.2E-02	1,000	1.2E-05		6.1E-03	6.1E-06	6.1E-03	6.1E-06
Nitrophenol, 4-	100-02-7	9.4E-03	1,200	7.8E-06		4.7E-03	3.9E-06	4.7E-03	3.9E-06
Nitroso-di-n-butylamine, n-	924-16-3	1.4E-03	2,000	7.1E-07		7.1E-04	3.5E-07	7.1E-04	3.5E-07
Nitrosodiphenylamine, N-	86-30-6	2.5E-04	1,400	1.8E-07		1.3E-04	9.0E-08	1.3E-04	9.0E-08
Nitrosodipropylamine, n-	621-64-7	1.4E-03	2,000	7.1E-07		7.1E-04	3.5E-07	7.1E-04	3.5E-07
n-Nitrosodiethylamine	55-18-5	1.4E-03	1,700	8.4E-07		7.1E-04	4.2E-07	7.1E-04	4.2E-07
n-Nitrosodimethylamine	62-75-9	1.4E-03	1,700	8.5E-07		7.2E-04	4.3E-07	7.2E-04	4.3E-07
n-Nitrosomethylethylamine	10595-95-6	2.4E-03	1,700	1.4E-06		1.2E-03	6.9E-07	1.2E-03	6.9E-07
n-Nitrosomorpholine	59-89-2	1.4E-03	74	1.9E-05		7.1E-04	9.6E-06	7.1E-04	9.6E-06
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	9.6E-08	3	3.2E-08		4.8E-08	1.6E-08	4.8E-08	1.6E-08
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.4E-06	75	1.8E-08		6.8E-07	9.1E-09	6.8E-07	9.1E-09
o-Tolualdehyde	529-20-4	1.0E-01	17,000	6.1E-06		5.2E-02	3.0E-06	5.2E-02	3.0E-06
p-Dimethylaminoazobenzene	60-11-7	1.4E-03	670	2.1E-06		7.1E-04	1.1E-06	7.1E-04	1.1E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	1.7E-08	0.10	1.7E-07		8.6E-09	8.6E-08	8.6E-09	8.6E-08
PentaCDF, 1,2,3,7,8-	57117-41-6	2.1E-07	0.24	8.6E-07		1.0E-07	4.3E-07	1.0E-07	4.3E-07
PentaCDF, 2,3,4,7,8-	57117-31-4	4.1E-07	0.07	5.6E-06		2.1E-07	2.8E-06	2.1E-07	2.8E-06
Pentachlorobenzene	608-93-5	1.4E-03	1,600	8.9E-07		7.1E-04	4.4E-07	7.1E-04	4.4E-07
Pentachloroethane	76-01-7	1.8E-03	320,000	5.7E-09		9.0E-04	2.8E-09	9.0E-04	2.8E-09
Pentachloronitrobenzene	82-68-8	1.5E-03	1,500	1.0E-06		7.5E-04	5.0E-07	7.5E-04	5.0E-07
Pentachlorophenol	87-86-5	7.1E-02	1,400	5.1E-05		3.5E-02	2.5E-05	3.5E-02	2.5E-05
Perchlorate	14797-73-0	1.3E-03	23	5.5E-05		6.3E-04	2.7E-05	6.3E-04	2.7E-05
Phenanthrene	85-01-8	8.2E-03	760	1.1E-05		4.1E-03	5.4E-06	4.1E-03	5.4E-06
Phenol	108-95-2	7.7E-03	5,800	1.3E-06		3.9E-03	6.7E-07	3.9E-03	6.7E-07

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Phosphorous	7723-14-0	2.7E-01	270	1.0E-03		1.4E-01	5.0E-04	1.4E-01	5.0E-04
Propanal	123-38-6	1.3E-01	110,000	1.2E-06		6.7E-02	6.1E-07	6.7E-02	6.1E-07
Propylbenzene	103-65-1	1.2E-02	5,400	2.2E-06		6.0E-03	1.1E-06	6.0E-03	1.1E-06
Propylene	115-07-1	1.3E-01	860,000	1.5E-07		6.3E-02	7.4E-08	6.3E-02	7.4E-08
Pyrene	129-00-0	5.8E-03	150	3.9E-05		2.9E-03	1.9E-05	2.9E-03	1.9E-05
Pyridine	110-86-1	2.1E-03	9,700	2.2E-07		1.1E-03	1.1E-07	1.1E-03	1.1E-07
Selenium	7782-49-2	4.0E-03	200	2.0E-05		2.0E-03	9.9E-06	2.0E-03	9.9E-06
Silver	7440-22-4	3.0E-03	100	3.0E-05		1.5E-03	1.5E-05	1.5E-03	1.5E-05
Styrene	100-42-5	3.4E-03	21,000	1.6E-07		1.7E-03	8.0E-08	1.7E-03	8.0E-08
TetraCDD, 2,3,7,8-	1746-01-6	6.0E-09	0.00003	2.0E-04		3.0E-09	9.9E-05	3.0E-09	9.9E-05
TetraCDF, 2,3,7,8-	51207-31-9	1.0E-07	0.07	1.4E-06		5.2E-08	7.0E-07	5.2E-08	7.0E-07
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.4E-03	240	5.9E-06		7.1E-04	3.0E-06	7.1E-04	3.0E-06
Tetrachloroethane, 1,1,2,2-	79-34-5	1.1E-03	7,000	1.6E-07		5.4E-04	7.8E-08	5.4E-04	7.8E-08
Tetrachloroethylene	127-18-4	6.5E-03	20,000	3.2E-07		3.2E-03	1.6E-07	3.2E-03	1.6E-07
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.8E-03	1,300	1.4E-06		9.2E-04	7.1E-07	9.2E-04	7.1E-07
Tetrahydrofuran	109-99-9	2.3E-03	290,000	8.1E-09		1.2E-03	4.0E-09	1.2E-03	4.0E-09
Toluene	108-88-3	7.3E-02	37,000	2.0E-06		3.6E-02	9.8E-07	3.6E-02	9.8E-07
Toluidine, o-	95-53-4	1.8E-02	8,800	2.1E-06		9.1E-03	1.0E-06	9.1E-03	1.0E-06
Trans-1,3-dichloropropene	10061-02-6	1.6E-03	75,000	2.1E-08		7.9E-04	1.1E-08	7.9E-04	1.1E-08
trans-2-Butene	624-64-6	2.0E-02	1,000,000	2.0E-08		1.0E-02	1.0E-08	1.0E-02	1.0E-08
Trichlorobenzene, 1,2,4-	120-82-1	1.7E-03	3,400	4.9E-07		8.4E-04	2.5E-07	8.4E-04	2.5E-07
Trichloroethane, 1,1,1-	71-55-6	7.0E-04	1,300,000	5.4E-10		3.5E-04	2.7E-10	3.5E-04	2.7E-10
Trichloroethane, 1,1,2-	79-00-5	1.9E-03	81,000	2.3E-08		9.5E-04	1.2E-08	9.5E-04	1.2E-08
Trichloroethylene	79-01-6	2.4E-03	700,000	3.5E-09		1.2E-03	1.7E-09	1.2E-03	1.7E-09
Trichlorophenol, 2,4,5-	95-95-4	3.7E-03	7,400	5.0E-07		1.8E-03	2.5E-07	1.8E-03	2.5E-07
Trichlorophenol, 2,4,6-	88-06-2	3.4E-03	1,800	1.9E-06		1.7E-03	9.4E-07	1.7E-03	9.4E-07
Trimethylbenzene, 1,3,5-	108-67-8	4.9E-02	690,000	7.1E-08		2.5E-02	3.6E-08	2.5E-02	3.6E-08
Trinitrobenzene, 1,3,5	99-35-4	1.4E-03	530	2.7E-06		7.1E-04	1.3E-06	7.1E-04	1.3E-06
Undecane	1120-21-4	3.1E-02	1,500	2.1E-05		1.6E-02	1.0E-05	1.6E-02	1.0E-05

Source M-136 A and M-225 A, Acute HQs and HI for Maximum Off-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.5	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
Vinyl Chloride	75-01-4	2.0E-02	180,000	1.1E-07		9.8E-03	5.5E-08	9.8E-03	5.5E-08
Xylene, m-	108-38-3	2.9E-02	22,000	1.3E-06		1.4E-02	6.5E-07	1.4E-02	6.5E-07
Xylene, o-	95-47-6	3.4E-02	22,000	1.5E-06		1.7E-02	7.7E-07	1.7E-02	7.7E-07
Xylene, p-	106-42-3	2.9E-02	22,000	1.3E-06		1.4E-02	6.5E-07	1.4E-02	6.5E-07
Zinc	7440-66-6	1.4E-01	1,900	7.3E-05		6.9E-02	3.6E-05	6.9E-02	3.6E-05
			Total	**0.9**		**Total**	**0.5**	**With adjusted Ni & Cr**	**1.2E-01**
Chromium adjustment factor	**0.05**								
Nickel adjustment factor	**0.017**								

Source M-136 A and M-225 A, Acute HQs and HI for Maximum On-Site, with adjustment for Ni and Cr

COPC Name	CAS Number	Acute Air Conc (ug/m^3)	AIEC (ug/m3)[1]	Hazard Quotient	0.50	Acute Air Conc Adjusted for 126,500 lbs (ug/m^3)	Hazard Quotient	Acute Air Conc Adjusted for 126,500 lbs, Ni and Cr (ug/m^3)	Hazard Quotient
1,2,3-Trimethylbenzene	526-73-8	8.7E-03	690,000	1.3E-08		4.3E-03	6.3E-09	4.3E-03	6.3E-09
1,2,4-Trimethylbenzene	95-63-6	5.2E-01	690,000	7.5E-07		2.6E-01	3.7E-07	2.6E-01	3.7E-07
1,4-Diethylbenzene	105-05-5	1.4E-02	12,000	1.2E-06		6.9E-03	5.8E-07	6.9E-03	5.8E-07
1-Butene	106-98-9	4.6E-01	1,200,000	3.8E-07		2.3E-01	1.9E-07	2.3E-01	1.9E-07
1-Chloronapthalene	90-13-1	1.1E-02	4,600	2.5E-06		5.7E-03	1.2E-06	5.7E-03	1.2E-06
1-Naphthylamine	134-32-7	2.3E-01	210	1.1E-03		1.1E-01	5.4E-04	1.1E-01	5.4E-04
2,2,4-Trimethylpentane	540-84-1	5.0E-01	14,000,000	3.6E-08		2.5E-01	1.8E-08	2.5E-01	1.8E-08
2,2-Dimethylbutane	75-83-2	2.9E-02	1,800,000	1.6E-08		1.4E-02	8.0E-09	1.4E-02	8.0E-09
2,3,4-Trimethylpentane	565-75-3	1.7E-01	14,000,000	1.2E-08		8.5E-02	6.1E-09	8.5E-02	6.1E-09
2,3-Dimethylbutane	79-29-8	7.3E-02	1,800,000	4.0E-08		3.6E-02	2.0E-08	3.6E-02	2.0E-08
2,3-Dimethylpentane	565-59-3	2.9E-01	1,800,000	1.6E-07		1.4E-01	8.0E-08	1.4E-01	8.0E-08
2,4-Dimethylpentane	108-08-7	1.1E-01	180,000	6.0E-07		5.4E-02	3.0E-07	5.4E-02	3.0E-07
2,5-Dimethylbenzaldehyde	5779-94-2	5.6E-01	17,000	3.3E-05		2.8E-01	1.6E-05	2.8E-01	1.6E-05
2,6-Dichlorophenol	87-65-0	1.1E-02	8,800	1.3E-06		5.7E-03	6.4E-07	5.7E-03	6.4E-07
2-Ethyltoluene	611-14-3	9.3E-03	12,000	7.8E-07		4.7E-03	3.9E-07	4.7E-03	3.9E-07
2-Hexanone	591-78-6	4.1E-02	41,000	1.0E-06		2.1E-02	5.0E-07	2.1E-02	5.0E-07
2-Methylhexane	591-76-4	3.5E-01	1,800,000	2.0E-07		1.8E-01	9.8E-08	1.8E-01	9.8E-08
2-Methylnaphthalene	91-57-6	1.5E-01	3,000	5.2E-05		7.7E-02	2.6E-05	7.7E-02	2.6E-05
2-Methylpentane	107-83-5	2.3E-01	1,800,000	1.3E-07		1.1E-01	6.3E-08	1.1E-01	6.3E-08
2-Naphthylamine	91-59-8	2.3E-01	320	7.1E-04		1.1E-01	3.6E-04	1.1E-01	3.6E-04
3-Ethyltoluene	620-14-4	9.9E-02	12,000	8.3E-06		5.0E-02	4.1E-06	5.0E-02	4.1E-06
3-Methylheptane	589-81-1	7.3E-02	1,400,000	5.2E-08		3.6E-02	2.6E-08	3.6E-02	2.6E-08
3-Methylhexane	589-34-4	4.6E-01	1,800,000	2.5E-07		2.3E-01	1.3E-07	2.3E-01	1.3E-07
3-Methylpentane	96-14-0	1.5E-01	1,800,000	8.2E-08		7.3E-02	4.1E-08	7.3E-02	4.1E-08
4,6-Dinitro-2-methylphenol	534-52-1	2.0E-01	200	9.9E-04		9.9E-02	4.9E-04	9.9E-02	4.9E-04
4-Aminobyphenyl	92-67-1	2.3E-01	490	4.7E-04		1.1E-01	2.3E-04	1.1E-01	2.3E-04
4-Ethyltoluene	622-96-8	1.1E-01	12,000	9.2E-06		5.5E-02	4.6E-06	5.5E-02	4.6E-06
Acenaphthene	83-32-9	1.1E-02	3,600	3.2E-06		5.7E-03	1.6E-06	5.7E-03	1.6E-06
Acenaphthylene	208-96-8	6.4E-02	10,000	6.4E-06		3.2E-02	3.2E-06	3.2E-02	3.2E-06

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Acetaldehyde	75-07-0	1.9E+00	470	4.1E-03	9.6E-01	2.0E-03	9.6E-01	2.0E-03
Acetone	67-64-1	5.0E-01	470,000	1.1E-06	2.5E-01	5.3E-07	2.5E-01	5.3E-07
Acetonitrile	75-05-8	3.9E-01	22,000	1.8E-05	2.0E-01	8.9E-06	2.0E-01	8.9E-06
Acetophenone	98-86-2	5.6E-02	10,000	5.6E-06	2.8E-02	2.8E-06	2.8E-02	2.8E-06
Acrylonitrile	107-13-1	3.3E-01	10,000	3.3E-05	1.7E-01	1.7E-05	1.7E-01	1.7E-05
Aluminum	7429-90-5	8.2E+02	3,000	2.7E-01	4.1E+02	1.4E-01	4.1E+02	1.4E-01
Aniline	62-53-3	1.7E-01	30,000	5.5E-06	8.3E-02	2.8E-06	8.3E-02	2.8E-06
Anthracene	120-12-7	2.7E-03	270	1.0E-05	1.3E-03	5.0E-06	1.3E-03	5.0E-06
Antimony	7440-36-0	6.0E-01	500	1.2E-03	3.0E-01	6.0E-04	3.0E-01	6.0E-04
Arsenic	7440-38-2	1.1E-02	0.20	5.6E-02	5.6E-03	2.8E-02	5.6E-03	2.8E-02
Barium	7440-39-3	8.0E-03	1,500	5.3E-06	4.0E-03	2.7E-06	4.0E-03	2.7E-06
Benzaldehyde	100-52-7	7.9E-01	17,000	4.6E-05	3.9E-01	2.3E-05	3.9E-01	2.3E-05
Benzene	71-43-2	2.5E+00	27	9.2E-02	1.2E+00	4.6E-02	1.2E+00	4.6E-02
Benzo(a)anthracene	56-55-3	1.2E-02	1,200	1.0E-05	6.1E-03	5.0E-06	6.1E-03	5.0E-06
Benzo(a)pyrene	50-32-8	1.6E-03	600	2.7E-06	7.9E-04	1.3E-06	7.9E-04	1.3E-06
Benzo(b)fluoranthene	205-99-2	2.4E-02	31	7.7E-04	1.2E-02	3.8E-04	1.2E-02	3.8E-04
Benzo(g,h,i)perylene	191-24-2	9.3E-03	30,000	3.1E-07	4.6E-03	1.5E-07	4.6E-03	1.5E-07
Benzo(k)fluoranthene	207-08-9	2.4E-02	19	1.3E-03	1.2E-02	6.2E-04	1.2E-02	6.2E-04
Benzoic acid	65-85-0	1.3E+00	2,800	4.6E-04	6.5E-01	2.3E-04	6.5E-01	2.3E-04
Benzyl alcohol	100-51-6	1.6E-02	130,000	1.2E-07	8.0E-03	6.2E-08	8.0E-03	6.2E-08
Benzyl chloride	100-44-7	1.2E-02	240	4.9E-05	5.9E-03	2.5E-05	5.9E-03	2.5E-05
Bis(2-chlorethyl)ether	111-44-4	1.3E-02	58,000	2.2E-07	6.3E-03	1.1E-07	6.3E-03	1.1E-07
Bis(2-chloroethoxy)methane	111-91-1	1.1E-02	920	1.2E-05	5.7E-03	6.2E-06	5.7E-03	6.2E-06
Bromodichloromethane	75-27-4	1.6E-02	260	6.2E-05	8.1E-03	3.1E-05	8.1E-03	3.1E-05
Bromoform	75-25-2	2.7E-02	15,000	1.8E-06	1.3E-02	9.0E-07	1.3E-02	9.0E-07
Bromophenyl-phenylether, 4-	101-55-3	1.1E-02	290	3.9E-05	5.7E-03	2.0E-05	5.7E-03	2.0E-05
Butylbenzylphthalate	85-68-7	3.1E-03	15,000	2.1E-07	1.6E-03	1.0E-07	1.6E-03	1.0E-07
Cadmium	7440-43-9	9.6E-04	100	9.6E-06	4.8E-04	4.8E-06	4.8E-04	4.8E-06
Carbazole	86-74-8	1.5E-02	660	2.2E-05	7.3E-03	1.1E-05	7.3E-03	1.1E-05
Carbon disulfide	75-15-0	2.0E-01	6,200	3.3E-05	1.0E-01	1.6E-05	1.0E-01	1.6E-05
Carbon tetrachloride	56-23-5	3.1E-01	1,900	1.6E-04	1.6E-01	8.2E-05	1.6E-01	8.2E-05
Chlorine	7782-50-5	2.4E+02	210	1.2E+00	1.2E+02	5.8E-01	1.2E+02	5.8E-01
Chloro-3-methylphenol, 4-	59-50-7	1.4E-02	5,500	2.6E-06	7.0E-03	1.3E-06	7.0E-03	1.3E-06
Chloroacetonitrile	107-14-2	2.3E-02	9,000	2.5E-06	1.1E-02	1.3E-06	1.1E-02	1.3E-06

Chloroaniline, p-	106-47-8	3.2E-03	2,200	1.5E-06	1.6E-03	7.3E-07	1.6E-03	7.3E-07
Chlorobenzene	108-90-7	5.2E-02	46,000	1.1E-06	2.6E-02	5.6E-07	2.6E-02	5.6E-07
Chloroethane	75-00-3	9.1E-03	260,000	3.5E-08	4.6E-03	1.8E-08	4.6E-03	1.8E-08
Chloroform (Trichloromethane)	67-66-3	1.3E-01	150	8.4E-04	6.3E-02	4.2E-04	6.3E-02	4.2E-04
Chloronaphthalene,2-	91-58-7	1.1E-02	600	1.9E-05	5.7E-03	9.4E-06	5.7E-03	9.4E-06
Chlorophenol, 2-	95-57-8	4.0E-02	1,300	3.1E-05	2.0E-02	1.5E-05	2.0E-02	1.5E-05
Chromium III	7440-47-3	2.2E-01	1,500	1.5E-04	1.1E-01	7.5E-05	5.6E-03	3.7E-06
Chromium, hexavalent	18540-29-9	1.8E-01	89	2.1E-03	9.2E-02	1.0E-03	4.6E-03	5.2E-05
Chrysene	218-01-9	1.5E-02	600	2.5E-05	7.5E-03	1.2E-05	7.5E-03	1.2E-05
Cis-1,3-dichloropropene	10062-01-5	2.7E-02	600	4.5E-05	1.3E-02	2.2E-05	1.3E-02	2.2E-05
cis-2-Butene	590-18-1	3.5E-02	150,000,000	2.3E-10	1.8E-02	1.2E-10	1.8E-02	1.2E-10
Cobalt	7440-48-4	2.5E-03	180	1.4E-05	1.2E-03	6.8E-06	1.2E-03	6.8E-06
Copper	7440-50-8	5.1E-01	100	5.1E-03	2.5E-01	2.5E-03	2.5E-01	2.5E-03
Cresol, m-	108-39-4	2.7E-03	20,000	1.3E-07	1.3E-03	6.6E-08	1.3E-03	6.6E-08
Cresol, o-	95-48-7	6.8E-02	20,000	3.4E-06	3.4E-02	1.7E-06	3.4E-02	1.7E-06
Cresol, p-	106-44-5	2.7E-03	20,000	1.3E-07	1.3E-03	6.6E-08	1.3E-03	6.6E-08
Crotonaldehyde	4170-30-3	6.6E-02	540	1.2E-04	3.3E-02	6.1E-05	3.3E-02	6.1E-05
Cumene	98-82-8	8.7E-03	250,000	3.5E-08	4.3E-03	1.7E-08	4.3E-03	1.7E-08
Cyclohexane	110-82-7	5.2E-02	340,000	1.5E-07	2.6E-02	7.6E-08	2.6E-02	7.6E-08
Dibenz(a,h)anthracene	53-70-3	2.1E-03	34	6.2E-05	1.1E-03	3.1E-05	1.1E-03	3.1E-05
Dibenzofuran	132-64-9	1.1E-02	30,000	3.8E-07	5.7E-03	1.9E-07	5.7E-03	1.9E-07
Dibromochloromethane	124-48-1	1.8E-02	7,400	2.5E-06	9.1E-03	1.2E-06	9.1E-03	1.2E-06
Dichlorobenzene, 1,2-	95-50-1	1.2E-02	300,000	3.9E-08	5.8E-03	1.9E-08	5.8E-03	1.9E-08
Dichlorobenzene, 1,3-	541-73-1	1.3E-02	16,000	8.1E-07	6.5E-03	4.0E-07	6.5E-03	4.0E-07
Dichlorobenzene,1,4-	106-46-7	1.2E-02	60,000	2.0E-07	6.0E-03	1.0E-07	6.0E-03	1.0E-07
Dichloroethane 1,1-	75-34-3	6.6E-03	650,000	1.0E-08	3.3E-03	5.1E-09	3.3E-03	5.1E-09
Dichloroethane, 1,2	107-06-2	1.1E-02	200,000	5.6E-08	5.6E-03	2.8E-08	5.6E-03	2.8E-08
Dichloroethylene 1,1-	75-35-4	8.9E-03	180,000	5.0E-08	4.4E-03	2.5E-08	4.4E-03	2.5E-08
Dichloroethylene, cis-1,2-	156-59-2	2.5E-03	560,000	4.4E-09	1.2E-03	2.2E-09	1.2E-03	2.2E-09
Dichloroethylene-1,2 (trans)	156-60-5	1.5E-02	1,100,000	1.4E-08	7.4E-03	6.8E-09	7.4E-03	6.8E-09
Dichlorophenol, 2,4-	120-83-2	1.9E-02	1,300	1.5E-05	9.6E-03	7.4E-06	9.6E-03	7.4E-06
Dichloropropane, 1,2-	78-87-5	7.7E-03	140,000	5.5E-08	3.8E-03	2.7E-08	3.8E-03	2.7E-08
Diethyl phthalate	84-66-2	1.7E-02	5,000	3.3E-06	8.3E-03	1.7E-06	8.3E-03	1.7E-06
Dimethyl phthalate	131-11-3	1.1E-02	15,000	7.6E-07	5.7E-03	3.8E-07	5.7E-03	3.8E-07

Dimethylphenol, 2,4-	105-67-9	1.4E-01	4,500	3.2E-05	7.1E-02	1.6E-05	7.1E-02	1.6E-05
Di-n-butyl phthalate	84-74-2	2.3E-01	15,000	1.5E-05	1.1E-01	7.6E-06	1.1E-01	7.6E-06
Dinitrobenzene, 1,3-	99-65-0	1.2E-02	1,000	1.2E-05	5.9E-03	5.9E-06	5.9E-03	5.9E-06
Dinitrophenol, 2,4-	51-28-5	5.0E-01	220	2.3E-03	2.5E-01	1.1E-03	2.5E-01	1.1E-03
Dinitrotoluene, 2,4-	121-14-2	1.1E-02	600	1.9E-05	5.7E-03	9.4E-06	5.7E-03	9.4E-06
Dinitrotoluene, 2,6-	606-20-2	1.2E-02	600	1.9E-05	5.8E-03	9.7E-06	5.8E-03	9.7E-06
Di-n-octylphthalate	117-84-0	7.7E-02	6,800	1.1E-05	3.8E-02	5.6E-06	3.8E-02	5.6E-06
Dioxane, 1,4-	123-91-1	1.3E-02	3,000	4.4E-06	6.6E-03	2.2E-06	6.6E-03	2.2E-06
Diphenylamine	122-39-4	1.1E-02	30,000	3.8E-07	5.7E-03	1.9E-07	5.7E-03	1.9E-07
Ethyl methacrylate	97-63-2	3.3E-02	13,000	2.6E-06	1.7E-02	1.3E-06	1.7E-02	1.3E-06
Ethylbenzene	100-41-4	2.3E-01	140,000	1.6E-06	1.1E-01	8.1E-07	1.1E-01	8.1E-07
Ethylene Dibromide	106-93-4	1.8E-02	130,000	1.4E-07	9.2E-03	7.1E-08	9.2E-03	7.1E-08
Ethylether	60-29-7	5.2E-02	1,500,000	3.5E-08	2.6E-02	1.7E-08	2.6E-02	1.7E-08
Ethylhexyl phthalate, bis-2-	117-81-7	2.4E-02	10,000	2.4E-06	1.2E-02	1.2E-06	1.2E-02	1.2E-06
Fluoranthene	206-44-0	5.5E-02	1,500	3.6E-05	2.7E-02	1.8E-05	2.7E-02	1.8E-05
Fluorene	86-73-7	1.4E-02	6,600	2.1E-06	6.8E-03	1.0E-06	6.8E-03	1.0E-06
Formaldehyde	50-00-0	9.7E-01	55	1.8E-02	4.9E-01	8.8E-03	4.9E-01	8.8E-03
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	6.0E-07	3	2.0E-07	3.0E-07	1.0E-07	3.0E-07	1.0E-07
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	1.5E-05	45	3.4E-07	7.5E-06	1.7E-07	7.5E-06	1.7E-07
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	3.9E-06	60	6.5E-08	2.0E-06	3.3E-08	2.0E-06	3.3E-08
HexaCDD, 1,2,3,4,7,8-	39227-28-6	7.2E-08	0.07	9.8E-07	3.6E-08	4.9E-07	3.6E-08	4.9E-07
HexaCDD, 1,2,3,6,7,8-	57653-85-7	1.8E-07	0.75	2.5E-07	9.2E-08	1.2E-07	9.2E-08	1.2E-07
HexaCDD, 1,2,3,7,8,9-	19408-74-3	1.3E-07	4	3.2E-08	6.3E-08	1.6E-08	6.3E-08	1.6E-08
HexaCDF, 1,2,3,4,7,8-	70648-26-9	5.4E-06	0.07	7.3E-05	2.7E-06	3.6E-05	2.7E-06	3.6E-05
HexaCDF, 1,2,3,6,7,8-	57117-44-9	3.3E-06	0.04	8.9E-05	1.7E-06	4.5E-05	1.7E-06	4.5E-05
HexaCDF, 1,2,3,7,8,9-	72918-21-9	2.5E-06	30	8.3E-08	1.2E-06	4.1E-08	1.2E-06	4.1E-08
HexaCDF, 2,3,4,6,7,8-	60851-34-5	3.9E-06	0.49	8.0E-06	2.0E-06	4.0E-06	2.0E-06	4.0E-06
Hexachloro-1,3-butadiene	87-68-3	1.7E-02	11,000	1.5E-06	8.4E-03	7.6E-07	8.4E-03	7.6E-07
Hexachlorobenzene	118-74-1	9.7E-02	6	1.6E-02	4.8E-02	8.0E-03	4.8E-02	8.0E-03
Hexachlorocyclopentadiene	77-47-4	2.3E-01	110	2.1E-03	1.1E-01	1.0E-03	1.1E-01	1.0E-03
Hexachloroethane (Perchloroethane)	67-72-1	1.2E-02	29,000	4.2E-07	6.1E-03	2.1E-07	6.1E-03	2.1E-07
Hexachloropropene	1888-71-7	1.6E-02	905	1.8E-05	8.2E-03	9.0E-06	8.2E-03	9.0E-06
Hexane	110-54-3	2.0E-01	1,100,000	1.8E-07	1.0E-01	9.2E-08	1.0E-01	9.2E-08
Hydrogen chloride	7647-01-0	3.7E+02	2,100	1.8E-01	1.8E+02	8.8E-02	1.8E+02	8.8E-02

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Indeno(1,2,3-cd) pyrene	193-39-5	8.1E-03	15	5.4E-04	4.1E-03	2.7E-04	4.1E-03	2.7E-04
Isophorone	78-59-1	1.1E-02	23,000	4.9E-07	5.7E-03	2.5E-07	5.7E-03	2.5E-07
Lead	7439-92-1	8.4E-01	150	5.6E-03	4.2E-01	2.8E-03	4.2E-01	2.8E-03
Manganese	7439-96-5	1.9E+00	3,000	6.4E-04	9.6E-01	3.2E-04	9.6E-01	3.2E-04
Mercuric chloride	7487-94-7	1.1E-04	2,700	4.1E-08	5.5E-05	2.0E-08	5.5E-05	2.0E-08
Methacrylonitrile	126-98-7	1.2E-01	2,700	4.5E-05	6.1E-02	2.3E-05	6.1E-02	2.3E-05
Methyl bromide	74-83-9	2.5E-03	3,900	6.4E-07	1.2E-03	3.2E-07	1.2E-03	3.2E-07
Methyl chloride	74-87-3	2.9E-01	210,000	1.4E-06	1.4E-01	6.9E-07	1.4E-01	6.9E-07
Methyl ethyl ketone	78-93-3	8.1E-02	13,000	6.2E-06	4.0E-02	3.1E-06	4.0E-02	3.1E-06
Methyl isobutyl ketone	108-10-1	1.7E-02	310,000	5.5E-08	8.5E-03	2.7E-08	8.5E-03	2.7E-08
Methyl tert-butyl ether	1634-04-4	2.7E-01	180,000	1.5E-06	1.3E-01	7.5E-07	1.3E-01	7.5E-07
Methylcyclohexane	108-87-2	2.5E-01	1,600,000	1.6E-07	1.2E-01	7.8E-08	1.2E-01	7.8E-08
Methylene chloride	75-09-2	5.0E+00	14,000	3.6E-04	2.5E+00	1.8E-04	2.5E+00	1.8E-04
Methylmethacrylate	80-62-6	3.3E-02	70,000	4.7E-07	1.7E-02	2.4E-07	1.7E-02	2.4E-07
Naphthalene	91-20-3	1.9E+00	79,000	2.4E-05	9.5E-01	1.2E-05	9.5E-01	1.2E-05
Nickel	7440-02-0	1.2E+00	0.20	5.9E+00	5.9E-01	3.0E+00	1.0E-02	5.1E-02
Nitroaniline, 2-	88-74-4	1.1E-02	4,800	2.4E-06	5.7E-03	1.2E-06	5.7E-03	1.2E-06
Nitroaniline, 3-	99-09-2	4.5E-02	110	4.1E-04	2.3E-02	2.1E-04	2.3E-02	2.1E-04
Nitroaniline, 4-	100-01-6	4.5E-02	9,000	5.0E-06	2.3E-02	2.5E-06	2.3E-02	2.5E-06
Nitrobenzene	98-95-3	1.3E-02	9,100	1.4E-06	6.5E-03	7.1E-07	6.5E-03	7.1E-07
Nitrophenol, 2-	88-75-5	9.8E-02	1,000	9.8E-05	4.9E-02	4.9E-05	4.9E-02	4.9E-05
Nitrophenol, 4-	100-02-7	7.5E-02	1,200	6.2E-05	3.7E-02	3.1E-05	3.7E-02	3.1E-05
Nitroso-di-n-butylamine, n-	924-16-3	1.1E-02	2,000	5.7E-06	5.7E-03	2.8E-06	5.7E-03	2.8E-06
Nitrosodiphenylamine, N-	86-30-6	2.0E-03	1,400	1.4E-06	1.0E-03	7.2E-07	1.0E-03	7.2E-07
Nitrosodipropylamine, n-	621-64-7	1.1E-02	2,000	5.7E-06	5.7E-03	2.8E-06	5.7E-03	2.8E-06
n-Nitrosodiethylamine	55-18-5	1.1E-02	1,700	6.7E-06	5.7E-03	3.3E-06	5.7E-03	3.3E-06
n-Nitrosodimethylamine	62-75-9	1.2E-02	1,700	6.8E-06	5.8E-03	3.4E-06	5.8E-03	3.4E-06
n-Nitrosomethylethylamine	10595-95-6	1.9E-02	1,700	1.1E-05	9.4E-03	5.5E-06	9.4E-03	5.5E-06
n-Nitrosomorpholine	59-89-2	1.1E-02	74	1.5E-04	5.7E-03	7.7E-05	5.7E-03	7.7E-05
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	7.6E-07	3	2.5E-07	3.8E-07	1.3E-07	3.8E-07	1.3E-07
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.1E-05	75	1.5E-07	5.5E-06	7.3E-08	5.5E-06	7.3E-08
o-Tolualdehyde	529-20-4	8.3E-01	17,000	4.9E-05	4.1E-01	2.4E-05	4.1E-01	2.4E-05
p-Dimethylaminoazobenzene	60-11-7	1.1E-02	670	1.7E-05	5.7E-03	8.4E-06	5.7E-03	8.4E-06
PentaCDD, 1,2,3,7,8-	40321-76-4	1.4E-07	0.10	1.4E-06	6.9E-08	6.9E-07	6.9E-08	6.9E-07

PentaCDF, 1,2,3,7,8-	57117-41-6	1.7E-06	0.24	6.9E-06	8.3E-07	3.4E-06	8.3E-07	3.4E-06
PentaCDF, 2,3,4,7,8-	57117-31-4	3.3E-06	0.07	4.5E-05	1.7E-06	2.2E-05	1.7E-06	2.2E-05
Pentachlorobenzene	608-93-5	1.1E-02	1,600	7.1E-06	5.7E-03	3.5E-06	5.7E-03	3.5E-06
Pentachloroethane	76-01-7	1.4E-02	320,000	4.5E-08	7.2E-03	2.3E-08	7.2E-03	2.3E-08
Pentachloronitrobenzene	82-68-8	1.2E-02	1,500	8.0E-06	6.0E-03	4.0E-06	6.0E-03	4.0E-06
Pentachlorophenol	87-86-5	5.7E-01	1,400	4.1E-04	2.8E-01	2.0E-04	2.8E-01	2.0E-04
Perchlorate	14797-73-0	1.0E-02	23	4.4E-04	5.1E-03	2.2E-04	5.1E-03	2.2E-04
Phenanthrene	85-01-8	6.6E-02	760	8.6E-05	3.3E-02	4.3E-05	3.3E-02	4.3E-05
Phenol	108-95-2	6.2E-02	5,800	1.1E-05	3.1E-02	5.3E-06	3.1E-02	5.3E-06
Phosphorous	7723-14-0	2.2E+00	270	8.3E-03	1.1E+00	4.2E-03	1.1E+00	4.2E-03
Propanal	123-38-6	1.1E+00	110,000	9.8E-06	5.4E-01	4.9E-06	5.4E-01	4.9E-06
Propylbenzene	103-65-1	9.5E-02	5,400	1.8E-05	4.8E-02	8.8E-06	4.8E-02	8.8E-06
Propylene	115-07-1	1.0E+00	860,000	1.2E-06	5.1E-01	5.9E-07	5.1E-01	5.9E-07
Pyrene	129-00-0	4.7E-02	150	3.1E-04	2.3E-02	1.6E-04	2.3E-02	1.6E-04
Pyridine	110-86-1	1.7E-02	9,700	1.7E-06	8.4E-03	8.6E-07	8.4E-03	8.6E-07
Selenium	7782-49-2	3.3E-02	200	1.6E-04	1.6E-02	8.2E-05	1.6E-02	8.2E-05
Silver	7440-22-4	2.5E-02	100	2.5E-04	1.2E-02	1.2E-04	1.2E-02	1.2E-04
Styrene	100-42-5	2.7E-02	21,000	1.3E-06	1.3E-02	6.4E-07	1.3E-02	6.4E-07
TetraCDD, 2,3,7,8-	1746-01-6	4.8E-08	0.00003	1.6E-03	2.4E-08	7.9E-04	2.4E-08	7.9E-04
TetraCDF, 2,3,7,8-	51207-31-9	8.3E-07	0.07	1.1E-05	4.1E-07	5.6E-06	4.1E-07	5.6E-06
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.1E-02	240	4.7E-05	5.7E-03	2.4E-05	5.7E-03	2.4E-05
Tetrachloroethane, 1,1,2,2-	79-34-5	8.7E-03	7,000	1.2E-06	4.3E-03	6.2E-07	4.3E-03	6.2E-07
Tetrachloroethylene	127-18-4	5.2E-02	20,000	2.6E-06	2.6E-02	1.3E-06	2.6E-02	1.3E-06
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.5E-02	1,300	1.1E-05	7.4E-03	5.7E-06	7.4E-03	5.7E-06
Tetrahydrofuran	109-99-9	1.9E-02	290,000	6.4E-08	9.3E-03	3.2E-08	9.3E-03	3.2E-08
Toluene	108-88-3	5.8E-01	37,000	1.6E-05	2.9E-01	7.8E-06	2.9E-01	7.8E-06
Toluidine, o-	95-53-4	1.5E-01	8,800	1.7E-05	7.3E-02	8.2E-06	7.3E-02	8.2E-06
Trans-1,3-dichloropropene	10061-02-6	1.3E-02	75,000	1.7E-07	6.3E-03	8.4E-08	6.3E-03	8.4E-08
trans-2-Butene	624-64-6	1.6E-01	1,000,000	1.6E-07	8.0E-02	8.0E-08	8.0E-02	8.0E-08
Trichlorobenzene, 1,2,4-	120-82-1	1.3E-02	3,400	3.9E-06	6.7E-03	2.0E-06	6.7E-03	2.0E-06
Trichloroethane, 1,1,1-	71-55-6	5.6E-03	1,300,000	4.3E-09	2.8E-03	2.1E-09	2.8E-03	2.1E-09
Trichloroethane, 1,1,2-	79-00-5	1.5E-02	81,000	1.9E-07	7.6E-03	9.3E-08	7.6E-03	9.3E-08
Trichloroethylene	79-01-6	1.9E-02	700,000	2.8E-08	9.7E-03	1.4E-08	9.7E-03	1.4E-08
Trichlorophenol, 2,4,5-	95-95-4	2.9E-02	7,400	4.0E-06	1.5E-02	2.0E-06	1.5E-02	2.0E-06

Source M-136 A and M-225 A, Acute HQs and HI for Maximum On-Site, with adjustment for Ni and Cr

Trichlorophenol, 2,4,6-	88-06-2	2.7E-02	1,800	1.5E-05	1.4E-02	7.5E-06	1.4E-02	7.5E-06
Trimethylbenzene, 1,3,5-	108-67-8	3.9E-01	690,000	5.7E-07	2.0E-01	2.8E-07	2.0E-01	2.8E-07
Trinitrobenzene, 1,3,5	99-35-4	1.1E-02	530	2.1E-05	5.7E-03	1.1E-05	5.7E-03	1.1E-05
Undecane	1120-21-4	2.5E-01	1,500	1.7E-04	1.2E-01	8.3E-05	1.2E-01	8.3E-05
Vinyl Chloride	75-01-4	1.6E-01	180,000	8.8E-07	7.9E-02	4.4E-07	7.9E-02	4.4E-07
Xylene, m-	108-38-3	2.3E-01	22,000	1.0E-05	1.1E-01	5.2E-06	1.1E-01	5.2E-06
Xylene, o-	95-47-6	2.7E-01	22,000	1.2E-05	1.3E-01	6.1E-06	1.3E-01	6.1E-06
Xylene, p-	106-42-3	2.3E-01	22,000	1.0E-05	1.1E-01	5.2E-06	1.1E-01	5.2E-06
Zinc	7440-66-6	1.1E+00	1,900	6.0E-04	5.7E-01	3.0E-04	5.7E-01	3.0E-04
			Total	**7.8**	**Total**	**3.9**	**With adjusted Ni & Cr**	**9.7E-01**
Chromium adjustment factor	**0.05**							
Nickel adjustment factor	**0.017**							

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk before	**Resident Adult total risk before**	linear adjustment to inhalation risk	**Resident Adult total risk after**	% of total risk after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.5E-07	91%	1.6E-07	7.3E-09	**2.1E-08**	35.3%
Adams Ranch	Nickel	7440-02-0	cancer risk (inhalation)	1.0E-09	0.6%		1.7E-11		0.08%
Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.2E-08	89%	4.7E-08	2.1E-09	**7.0E-09**	29.9%
Christensen Ranch	Nickel	7440-02-0	cancer risk (inhalation)	2.9E-10	1%		5.0E-12		0.07%
Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.4E-08	90%	1.6E-08	7.2E-10	**2.2E-09**	32.6%
Howell Dairy	Nickel	7440-02-0	cancer risk (inhalation)	1.0E-10	1%		1.7E-12		0.08%
bluecrk	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.9E-07	89%	3.3E-07	1.5E-08	**5.0E-08**	29.5%
bluecrk	Nickel	7440-02-0	cancer risk (inhalation)	2.0E-09	1%		3.5E-11		0.07%
bound 2	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.1E-07	90%	1.2E-07	5.4E-09	**1.6E-08**	32.9%
bound 2	Nickel	7440-02-0	cancer risk (inhalation)	7.6E-10	1%		1.3E-11		0.08%
bound1	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.8E-07	90%	3.1E-07	1.4E-08	**4.3E-08**	32.2%
bound1	Nickel	7440-02-0	cancer risk (inhalation)	1.9E-09	1%		3.3E-11		0.08%
bound 3	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.7E-08	87%	3.1E-08	1.4E-09	**5.1E-09**	26.4%
bound 3	Nickel	7440-02-0	cancer risk (inhalation)	1.9E-10	1%		3.2E-12		0.06%
bound 4	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.9E-08	87%	3.3E-08	1.4E-09	**5.6E-09**	25.8%
bound 4	Nickel	7440-02-0	cancer risk (inhalation)	2.0E-10	0.6%		3.4E-12		0.06%
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.1E-08	88%	2.4E-08	1.1E-09	**3.7E-09**	28.7%
holmgren ranch	Nickel	7440-02-0	cancer risk (inhalation)	1.5E-10	0.6%		2.5E-12		0.07%
Penrose	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.3E-08	86%	1.5E-08	6.5E-10	**2.6E-09**	24.8%
Penrose	Nickel	7440-02-0	cancer risk (inhalation)	9.1E-11	0.6%		1.5E-12		0.06%
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.5E-08	91%	1.7E-08	7.7E-10	**2.3E-09**	33.9%
Thatcher	Nickel	7440-02-0	cancer risk (inhalation)	1.1E-10	0.6%		1.8E-12		0.08%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	8.4E-09	87%	9.7E-09	4.2E-10	**1.6E-09**	25.9%
ATK Ranch Pond	Nickel	7440-02-0	cancer risk (inhalation)	5.9E-11	0.6%		1.0E-12		0.06%
Maximum Off-site	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.3E-07	90%	4.8E-07	2.2E-08	**6.9E-08**	31.4%
Maximum Off-site	Nickel	7440-02-0	cancer risk (inhalation)	3.0E-09	1%		5.1E-11		0.1%

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk before	**Resident Child total risk before**	linear adjustment to inhalation risk	**Resident Child total risk after**	% of total risk after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.3E-08	90%	7.0E-08	3.2E-09	**1.0E-08**	31.4%
Adams Ranch	Nickel	7440-02-0	cancer risk (inhalation)	2.3E-10	0.3%		4.0E-12		0.04%
Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.8E-08	90%	2.0E-08	9.0E-10	**3.0E-09**	30.6%
Christensen Ranch	Nickel	7440-02-0	cancer risk (inhalation)	6.7E-11	0%		1.1E-12		0.04%
Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.2E-09	61%	7.0E-09	3.1E-10	**4.3E-09**	7.2%
Howell Dairy	Nickel	7440-02-0	cancer risk (inhalation)	2.3E-11	0%		4.0E-13		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.3E-07	90%	1.4E-07	6.3E-09	**2.0E-08**	32.0%
bluecrk	Nickel	7440-02-0	cancer risk (inhalation)	4.7E-10	0%		8.0E-12		0.04%
bound 2	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.7E-08	90%	5.2E-08	2.3E-09	**7.5E-09**	31.4%
bound 2	Nickel	7440-02-0	cancer risk (inhalation)	1.7E-10	0%		3.0E-12		0.04%
bound1	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-07	90%	1.3E-07	6.0E-09	**1.9E-08**	31.4%
bound1	Nickel	7440-02-0	cancer risk (inhalation)	4.5E-10	0%		7.6E-12		0.04%
bound 3	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-08	90%	1.3E-08	5.9E-10	**1.9E-09**	30.7%
bound 3	Nickel	7440-02-0	cancer risk (inhalation)	4.4E-11	0%		7.4E-13		0.04%
bound 4	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-08	89%	1.4E-08	6.2E-10	**2.0E-09**	30.3%
bound 4	Nickel	7440-02-0	cancer risk (inhalation)	4.6E-11	0.3%		7.9E-13		0.04%
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	9.2E-09	90%	1.0E-08	4.6E-10	**1.5E-09**	30.6%
holmgren ranch	Nickel	7440-02-0	cancer risk (inhalation)	3.4E-11	0%		5.8E-13		0.04%
Penrose	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	5.6E-09	89%	6.3E-09	2.8E-10	**9.6E-10**	29.3%
Penrose	Nickel	7440-02-0	cancer risk (inhalation)	2.1E-11	0.3%		3.6E-13		0.04%
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.7E-09	90%	7.4E-09	3.3E-10	**1.1E-09**	30.6%
Thatcher	Nickel	7440-02-0	cancer risk (inhalation)	2.5E-11	0.3%		4.2E-13		0.04%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.7E-09	88%	4.1E-09	1.8E-10	**6.5E-10**	28.2%
ATK Ranch Pond	Nickel	7440-02-0	cancer risk (inhalation)	1.4E-11	0.3%		2.3E-13		0.04%
Maximum Off-site	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.8E-07	90%	2.1E-07	9.2E-09	**2.9E-08**	31.8%
Maximum Off-site	Nickel	7440-02-0	cancer risk (inhalation)	6.9E-10	0%		1.2E-11		0.0%

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk before	**Farmer Adult total risk before**	linear adjustment to inhalation risk	**Farmer Adult total risk after**	% of total risk after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.7E-07	49%	3.4E-07	8.4E-09	**1.8E-07**	4.7%
Adams Ranch	Nickel	7440-02-0	cancer risk (inhalation)	1.6E-09	0.5%		2.7E-11		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.8E-08	49%	9.9E-08	2.4E-09	**5.3E-08**	4.6%
Christensen Ranch	Nickel	7440-02-0	cancer risk (inhalation)	4.5E-10	0%		7.6E-12		0.01%
Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.7E-08	46%	3.6E-08	8.3E-10	**2.0E-08**	4.1%
Howell Dairy	Nickel	7440-02-0	cancer risk (inhalation)	1.6E-10	0%		2.6E-12		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.4E-07	50%	6.7E-07	1.7E-08	**3.5E-07**	4.9%
bluecrk	Nickel	7440-02-0	cancer risk (inhalation)	3.1E-09	0%		5.4E-11		0.02%
bound 2	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-07	50%	2.5E-07	6.2E-09	**1.3E-07**	4.8%
bound 2	Nickel	7440-02-0	cancer risk (inhalation)	1.2E-09	0%		2.0E-11		0.02%
bound1	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.2E-07	49%	6.5E-07	1.6E-08	**3.4E-07**	4.7%
bound1	Nickel	7440-02-0	cancer risk (inhalation)	3.0E-09	0%		5.1E-11		0.01%
bound 3	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.1E-08	49%	6.4E-08	1.6E-09	**3.4E-08**	4.6%
bound 3	Nickel	7440-02-0	cancer risk (inhalation)	2.9E-10	0%		4.9E-12		0.01%
bound 4	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.3E-08	48%	6.9E-08	1.7E-09	**3.7E-08**	4.4%
bound 4	Nickel	7440-02-0	cancer risk (inhalation)	3.1E-10	0.4%		5.2E-12		0.01%
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.4E-08	49%	5.0E-08	1.2E-09	**2.7E-08**	4.6%
holmgren ranch	Nickel	7440-02-0	cancer risk (inhalation)	2.3E-10	0.5%		3.9E-12		0.01%
Penrose	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.5E-08	47%	3.2E-08	7.5E-10	**1.8E-08**	4.2%
Penrose	Nickel	7440-02-0	cancer risk (inhalation)	1.4E-10	0.4%		2.4E-12		0.01%
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.8E-08	48%	3.7E-08	8.9E-10	**2.0E-08**	4.4%
Thatcher	Nickel	7440-02-0	cancer risk (inhalation)	1.7E-10	0.4%		2.8E-12		0.01%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	9.7E-09	46%	2.1E-08	4.9E-10	**1.2E-08**	4.2%
ATK Ranch Pond	Nickel	7440-02-0	cancer risk (inhalation)	9.1E-11	0.4%		1.5E-12		0.01%
Maximum Off-site	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.9E-07	50%	9.8E-07	2.5E-08	**5.1E-07**	4.8%
Maximum Off-site	Nickel	7440-02-0	cancer risk (inhalation)	4.6E-09	0%		7.8E-11		0.02%

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk before	**Farmer Child total risk before**	linear adjustment to inhalation risk	**Farmer Child total risk after**	% of total risk after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.3E-08	53%	1.2E-07	3.2E-09	**6.0E-08**	5.3%
Adams Ranch	Nickel	7440-02-0	cancer risk (inhalation)	2.3E-10	0.2%		3.9E-12		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.8E-08	52%	3.5E-08	9.0E-10	**1.8E-08**	5.1%
Christensen Ranch	Nickel	7440-02-0	cancer risk (inhalation)	6.7E-11	0%		1.1E-12		0.01%
Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.2E-09	50%	1.3E-08	3.1E-10	**6.6E-09**	4.7%
Howell Dairy	Nickel	7440-02-0	cancer risk (inhalation)	2.3E-11	0%		4.0E-13		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.3E-07	53%	2.4E-07	6.3E-09	**1.2E-07**	5.4%
bluecrk	Nickel	7440-02-0	cancer risk (inhalation)	4.7E-10	0%		8.0E-12		0.01%
bound 2	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.7E-08	53%	8.9E-08	2.3E-09	**4.4E-08**	5.3%
bound 2	Nickel	7440-02-0	cancer risk (inhalation)	1.7E-10	0%		3.0E-12		0.01%
bound1	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-07	53%	2.3E-07	6.0E-09	**1.1E-07**	5.3%
bound1	Nickel	7440-02-0	cancer risk (inhalation)	4.5E-10	0%		7.6E-12		0.01%
bound 3	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-08	52%	2.3E-08	5.9E-10	**1.1E-08**	5.1%
bound 3	Nickel	7440-02-0	cancer risk (inhalation)	4.4E-11	0%		7.4E-13		0.01%
bound 4	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-08	51%	2.4E-08	6.2E-10	**1.2E-08**	5.0%
bound 4	Nickel	7440-02-0	cancer risk (inhalation)	4.6E-11	0.2%		7.9E-13		0.01%
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	9.2E-09	52%	1.8E-08	4.6E-10	**9.0E-09**	5.1%
holmgren ranch	Nickel	7440-02-0	cancer risk (inhalation)	3.4E-11	0.2%		5.8E-13		0.01%
Penrose	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	5.6E-09	50%	1.1E-08	2.8E-10	**5.8E-09**	4.8%
Penrose	Nickel	7440-02-0	cancer risk (inhalation)	2.1E-11	0.2%		3.6E-13		0.01%
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	5.6E-09	44%	1.3E-08	2.8E-10	**7.5E-09**	3.7%
Thatcher	Nickel	7440-02-0	cancer risk (inhalation)	2.5E-11	0.2%		4.2E-13		0.01%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.7E-09	49%	7.5E-09	1.8E-10	**4.0E-09**	4.6%
ATK Ranch Pond	Nickel	7440-02-0	cancer risk (inhalation)	1.4E-11	0.2%		2.4E-13		0.01%
Maximum Off-site	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.9E-07	54%	3.5E-07	9.5E-09	**1.7E-07**	5.6%
Maximum Off-site	Nickel	7440-02-0	cancer risk (inhalation)	6.9E-10	0%		1.2E-11		0.0%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Resident Adult total HI before**	linear adjustment to inhalation HQ	**Resident Adult total HI after**	% of total HI after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-05	0.1%	**1.7E-02**	8.2E-07	**1.7E-02**	0.00%
Adams Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	3.8E-10	0.0%		1.9E-11		0.00%
Adams Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-04	0.7%		2.0E-06		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.7E-06	0.1%	**5.0E-03**	2.3E-07	**5.0E-03**	0.00%
Christensen Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-10	0.0%		5.4E-12		0.00%
Christensen Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-05	1%		5.7E-07		0.00%
Howell Dairy	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-06	0%	**1.9E-03**	8.1E-08	**1.9E-03**	0.00%
Howell Dairy	Chromium	7440-47-3	hazard quotient (inhalation)	3.7E-11	0%		1.9E-12		0.00%
Howell Dairy	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0%		2.0E-07		0.00%
bluecrk	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.3E-05	0%	**3.3E-02**	1.6E-06	**3.3E-02**	0.01%
bluecrk	Chromium	7440-47-3	hazard quotient (inhalation)	7.6E-10	0%		3.8E-11		0.00%
bluecrk	Nickel	7440-02-0	hazard quotient (inhalation)	2.4E-04	1%		4.0E-06		0.02%
bound 2	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.2E-05	0%	**1.3E-02**	6.1E-07	**1.3E-02**	0.00%
bound 2	Chromium	7440-47-3	hazard quotient (inhalation)	2.8E-10	0%		1.4E-11		0.00%
bound 2	Nickel	7440-02-0	hazard quotient (inhalation)	8.7E-05	1%		1.5E-06		0.01%
bound1	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.1E-05	0%	**3.2E-02**	1.6E-06	**3.2E-02**	0.01%
bound1	Chromium	7440-47-3	hazard quotient (inhalation)	7.2E-10	0%		3.6E-11		0.00%
bound1	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-04	1%		3.8E-06		0.02%
bound 3	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.0E-06	0%	**3.2E-03**	1.5E-07	**3.2E-03**	0.00%
bound 3	Chromium	7440-47-3	hazard quotient (inhalation)	7.0E-11	0%		3.5E-12		0.00%
bound 3	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-05	1%		3.7E-07		0.00%
bound 4	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.2E-06	0%	**3.5E-03**	1.6E-07	**3.5E-03**	0.00%
bound 4	Chromium	7440-47-3	hazard quotient (inhalation)	7.4E-11	0%		3.7E-12		0.00%
bound 4	Nickel	7440-02-0	hazard quotient (inhalation)	2.3E-05	0.7%		3.9E-07		0.00%
holmgren ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	2.4E-06	0%	**2.6E-03**	1.2E-07	**2.5E-03**	0.00%
holmgren ranch	Chromium	7440-47-3	hazard quotient (inhalation)	5.5E-11	0%		2.7E-12		0.00%
holmgren ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.7E-05	1%		2.9E-07		0.00%
Penrose	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.5E-06	0%	**1.7E-03**	7.3E-08	**1.6E-03**	0.00%
Penrose	Chromium	7440-47-3	hazard quotient (inhalation)	3.4E-11	0%		1.7E-12		0.00%
Penrose	Nickel	7440-02-0	hazard quotient (inhalation)	1.0E-05	0.6%		1.8E-07		0.00%
Thatcher	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.7E-06	0%	**1.9E-03**	8.6E-08	**1.8E-03**	0.00%
Thatcher	Chromium	7440-47-3	hazard quotient (inhalation)	4.0E-11	0%		2.0E-12		0.00%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Resident Adult total HI before**	linear adjustment to inhalation HQ	**Resident Adult total HI after**	% of total HI after adjusting
Thatcher	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0.7%		2.1E-07		0.00%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	9.5E-07	0%	**1.1E-03**	4.7E-08	**1.1E-03**	0.00%
ATK Ranch Pond	Chromium	7440-47-3	hazard quotient (inhalation)	2.2E-11	0%		1.1E-12		0.00%
ATK Ranch Pond	Nickel	7440-02-0	hazard quotient (inhalation)	6.8E-06	0.6%		1.2E-07		0.00%
Maximum Off-site	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.8E-05	0%	**4.9E-02**	2.4E-06	**4.8E-02**	0.01%
Maximum Off-site	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-09	0%		5.5E-11		0.00%
Maximum Off-site	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-04	1%		5.8E-06		0.03%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Resident Child total HI before**	linear adjustment to inhalation HQ	**Resident Child total HI after**	% of total HI after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-05	0.1%	**1.7E-02**	8.2E-07	**1.7E-02**	0.00%
Adams Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	3.8E-10	0.0%		1.9E-11		0.00%
Adams Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-04	0.7%		2.0E-06		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.7E-06	0.1%	**5.0E-03**	2.3E-07	**5.0E-03**	0.0%
Christensen Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-10	0.0%		5.4E-12		0.0%
Christensen Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-05	1%		5.7E-07		0.01%
Howell Dairy	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-06	0%	**1.9E-03**	8.1E-08	**1.9E-03**	0.0%
Howell Dairy	Chromium	7440-47-3	hazard quotient (inhalation)	3.7E-11	0%		1.9E-12		0.0%
Howell Dairy	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0%		2.0E-07		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.3E-05	0%	**3.3E-02**	1.6E-06	**3.3E-02**	0.0%
bluecrk	Chromium	7440-47-3	hazard quotient (inhalation)	7.6E-10	0%		3.8E-11		0.0%
bluecrk	Nickel	7440-02-0	hazard quotient (inhalation)	2.4E-04	1%		4.0E-06		0.01%
bound 2	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.2E-05	0%	**1.3E-02**	6.1E-07	**1.3E-02**	0.0%
bound 2	Chromium	7440-47-3	hazard quotient (inhalation)	2.8E-10	0%		1.4E-11		0.0%
bound 2	Nickel	7440-02-0	hazard quotient (inhalation)	8.7E-05	1%		1.5E-06		0.01%
bound1	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.1E-05	0%	**3.2E-02**	1.6E-06	**3.2E-02**	0.0%
bound1	Chromium	7440-47-3	hazard quotient (inhalation)	7.2E-10	0%		3.6E-11		0.0%
bound1	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-04	1%		3.8E-06		0.01%
bound 3	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.0E-06	0%	**3.2E-03**	1.5E-07	**3.2E-03**	0.0%
bound 3	Chromium	7440-47-3	hazard quotient (inhalation)	7.0E-11	0%		3.5E-12		0.0%
bound 3	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-05	1%		3.7E-07		0.01%
bound 4	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.2E-06	0%	**3.5E-03**	1.6E-07	**3.5E-03**	0.0%
bound 4	Chromium	7440-47-3	hazard quotient (inhalation)	7.4E-11	0%		3.7E-12		0.0%
bound 4	Nickel	7440-02-0	hazard quotient (inhalation)	2.3E-05	0.7%		3.9E-07		0.01%
holmgren ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	2.4E-06	0%	**2.6E-03**	1.2E-07	**2.5E-03**	0.0%
holmgren ranch	Chromium	7440-47-3	hazard quotient (inhalation)	5.5E-11	0%		2.7E-12		0.0%
holmgren ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.7E-05	1%		2.9E-07		0.01%
Penrose	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.5E-06	0%	**1.7E-03**	7.3E-08	**1.6E-03**	0.0%
Penrose	Chromium	7440-47-3	hazard quotient (inhalation)	3.4E-11	0%		1.7E-12		0.0%
Penrose	Nickel	7440-02-0	hazard quotient (inhalation)	1.0E-05	0.6%		1.8E-07		0.01%
Thatcher	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.7E-06	0%	**1.9E-03**	8.6E-08	**1.8E-03**	0.0%
Thatcher	Chromium	7440-47-3	hazard quotient (inhalation)	4.0E-11	0%		2.0E-12		0.0%
Thatcher	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0.7%		2.1E-07		0.01%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	9.5E-07	0%	**1.1E-03**	4.7E-08	**1.1E-03**	0.0%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Resident Child total HI before**	linear adjustment to inhalation HQ	**Resident Child total HI after**	% of total HI after adjusting
ATK Ranch Pond	Chromium	7440-47-3	hazard quotient (inhalation)	2.2E-11	0%		1.1E-12		0.0%
ATK Ranch Pond	Nickel	7440-02-0	hazard quotient (inhalation)	6.8E-06	0.6%		1.2E-07		0.01%
Maximum Off-site	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.8E-05	0%	**4.9E-02**	2.4E-06	**4.8E-02**	0.0%
Maximum Off-site	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-09	0%		5.5E-11		0.0%
Maximum Off-site	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-04	1%		5.8E-06		0.0%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Farmer Adult total HI before**	linear adjustment to inhalation HQ	**Farmer Adult total HI after**	% of total HI after adjustin g
Adams Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-05	0.1%	**1.7E-02**	8.2E-07	**1.7E-02**	0.0%
Adams Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	3.8E-10	0.0%		1.9E-11		0.0%
Adams Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-04	0.7%		2.0E-06		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.7E-06	0.1%	**5.0E-03**	2.3E-07	**5.0E-03**	0.0%
Christensen Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-10	0.0%		5.4E-12		0.0%
Christensen Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-05	1%		5.7E-07		0.01%
Howell Dairy	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-06	0%	**1.9E-03**	8.1E-08	**1.9E-03**	0.0%
Howell Dairy	Chromium	7440-47-3	hazard quotient (inhalation)	3.7E-11	0%		1.9E-12		0.0%
Howell Dairy	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0%		2.0E-07		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.3E-05	0%	**3.3E-02**	1.6E-06	**3.3E-02**	0.0%
bluecrk	Chromium	7440-47-3	hazard quotient (inhalation)	7.6E-10	0%		3.8E-11		0.0%
bluecrk	Nickel	7440-02-0	hazard quotient (inhalation)	2.4E-04	1%		4.0E-06		0.01%
bound 2	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.2E-05	0%	**1.3E-02**	6.1E-07	**1.3E-02**	0.0%
bound 2	Chromium	7440-47-3	hazard quotient (inhalation)	2.8E-10	0%		1.4E-11		0.0%
bound 2	Nickel	7440-02-0	hazard quotient (inhalation)	8.7E-05	1%		1.5E-06		0.01%
bound1	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.1E-05	0%	**3.3E-02**	1.6E-06	**3.2E-02**	0.0%
bound1	Chromium	7440-47-3	hazard quotient (inhalation)	7.2E-10	0%		3.6E-11		0.0%
bound1	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-04	1%		3.8E-06		0.01%
bound 3	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.0E-06	0%	**3.2E-03**	1.5E-07	**3.2E-03**	0.0%
bound 3	Chromium	7440-47-3	hazard quotient (inhalation)	7.0E-11	0%		3.5E-12		0.0%
bound 3	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-05	1%		3.7E-07		0.01%
bound 4	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.2E-06	0%	**3.5E-03**	1.6E-07	**3.5E-03**	0.0%
bound 4	Chromium	7440-47-3	hazard quotient (inhalation)	7.4E-11	0%		3.7E-12		0.0%
bound 4	Nickel	7440-02-0	hazard quotient (inhalation)	2.3E-05	0.7%		3.9E-07		0.01%
holmgren ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	2.4E-06	0%	**2.6E-03**	1.2E-07	**2.5E-03**	0.0%
holmgren ranch	Chromium	7440-47-3	hazard quotient (inhalation)	5.5E-11	0%		2.7E-12		0.0%
holmgren ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.7E-05	1%		2.9E-07		0.01%
Penrose	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.5E-06	0%	**1.7E-03**	7.3E-08	**1.6E-03**	0.0%
Penrose	Chromium	7440-47-3	hazard quotient (inhalation)	3.4E-11	0%		1.7E-12		0.0%
Penrose	Nickel	7440-02-0	hazard quotient (inhalation)	1.0E-05	0.6%		1.8E-07		0.01%
Thatcher	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.7E-06	0%	**1.9E-03**	8.6E-08	**1.8E-03**	0.0%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Farmer Adult total HI before**	linear adjustment to inhalation HQ	**Farmer Adult total HI after**	% of total HI after adjustin g
Thatcher	Chromium	7440-47-3	hazard quotient (inhalation)	4.0E-11	0%		2.0E-12		0.0%
Thatcher	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0.7%		2.1E-07		0.01%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	9.5E-07	0%	**1.1E-03**	4.7E-08	**1.1E-03**	0.0%
ATK Ranch Pond	Chromium	7440-47-3	hazard quotient (inhalation)	2.2E-11	0%		1.1E-12		0.0%
ATK Ranch Pond	Nickel	7440-02-0	hazard quotient (inhalation)	6.8E-06	0.6%		1.2E-07		0.01%
Maximum Off-site	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.8E-05	0%	**4.9E-02**	2.4E-06	**4.9E-02**	0.0%
Maximum Off-site	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-09	0%		5.5E-11		0.0%
Maximum Off-site	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-04	1%		5.8E-06		0.01%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Farmer Child total HI before**	linear adjustment to inhalation HQ	**Farmer Child total HI after**	% of total HI after adjusting
Adams Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-05	0.1%	**1.7E-02**	8.2E-07	**1.7E-02**	0.0%
Adams Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	3.8E-10	0.0%		1.9E-11		0.0%
Adams Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-04	0.7%		2.0E-06		0.01%
Christensen Ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.7E-06	0.1%	**5.0E-03**	2.3E-07	**5.0E-03**	0.0%
Christensen Ranch	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-10	0.0%		5.4E-12		0.0%
Christensen Ranch	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-05	1%		5.7E-07		0.01%
Howell Dairy	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.6E-06	0%	**1.9E-03**	8.1E-08	**1.9E-03**	0.0%
Howell Dairy	Chromium	7440-47-3	hazard quotient (inhalation)	3.7E-11	0%		1.9E-12		0.0%
Howell Dairy	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0%		2.0E-07		0.01%
bluecrk	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.3E-05	0%	**3.3E-02**	1.6E-06	**3.3E-02**	0.0%
bluecrk	Chromium	7440-47-3	hazard quotient (inhalation)	7.6E-10	0%		3.8E-11		0.0%
bluecrk	Nickel	7440-02-0	hazard quotient (inhalation)	2.4E-04	1%		4.0E-06		0.01%
bound 2	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.2E-05	0%	**1.3E-02**	6.1E-07	**1.3E-02**	0.0%
bound 2	Chromium	7440-47-3	hazard quotient (inhalation)	2.8E-10	0%		1.4E-11		0.0%
bound 2	Nickel	7440-02-0	hazard quotient (inhalation)	8.7E-05	1%		1.5E-06		0.01%
bound1	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.1E-05	0%	**3.3E-02**	1.6E-06	**3.2E-02**	0.0%
bound1	Chromium	7440-47-3	hazard quotient (inhalation)	7.2E-10	0%		3.6E-11		0.0%
bound1	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-04	1%		3.8E-06		0.01%
bound 3	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.0E-06	0%	**3.3E-03**	1.5E-07	**3.2E-03**	0.0%
bound 3	Chromium	7440-47-3	hazard quotient (inhalation)	7.0E-11	0%		3.5E-12		0.0%
bound 3	Nickel	7440-02-0	hazard quotient (inhalation)	2.2E-05	1%		3.7E-07		0.01%
bound 4	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.2E-06	0%	**3.5E-03**	1.6E-07	**3.5E-03**	0.0%
bound 4	Chromium	7440-47-3	hazard quotient (inhalation)	7.4E-11	0%		3.7E-12		0.0%
bound 4	Nickel	7440-02-0	hazard quotient (inhalation)	2.3E-05	0.7%		3.9E-07		0.01%
holmgren ranch	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	2.4E-06	0%	**2.6E-03**	1.2E-07	**2.6E-03**	0.0%
holmgren ranch	Chromium	7440-47-3	hazard quotient (inhalation)	5.5E-11	0%		2.7E-12		0.0%
holmgren ranch	Nickel	7440-02-0	hazard quotient (inhalation)	1.7E-05	1%		2.9E-07		0.01%
Penrose	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.5E-06	0%	**1.7E-03**	7.3E-08	**1.6E-03**	0.0%
Penrose	Chromium	7440-47-3	hazard quotient (inhalation)	3.4E-11	0%		1.7E-12		0.0%
Penrose	Nickel	7440-02-0	hazard quotient (inhalation)	1.0E-05	0.6%		1.8E-07		0.01%
Thatcher	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.7E-06	0%	**1.9E-03**	8.6E-08	**1.8E-03**	0.0%
Thatcher	Chromium	7440-47-3	hazard quotient (inhalation)	4.0E-11	0%		2.0E-12		0.0%

Receptor Name	COPC Name	CAS Number	Pathway	HQ	% of total HI before	**Farmer Child total HI before**	linear adjustment to inhalation HQ	**Farmer Child total HI after**	% of total HI after adjusting
Thatcher	Nickel	7440-02-0	hazard quotient (inhalation)	1.2E-05	0.7%		2.1E-07		0.01%
ATK Ranch Pond	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	9.5E-07	0%	**1.1E-03**	4.7E-08	**1.1E-03**	0.0%
ATK Ranch Pond	Chromium	7440-47-3	hazard quotient (inhalation)	2.2E-11	0%		1.1E-12		0.0%
ATK Ranch Pond	Nickel	7440-02-0	hazard quotient (inhalation)	6.8E-06	0.6%		1.2E-07		0.01%
Maximum Off-site	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	4.8E-05	0%	**4.9E-02**	2.4E-06	**4.9E-02**	0.0%
Maximum Off-site	Chromium	7440-47-3	hazard quotient (inhalation)	1.1E-09	0%		5.5E-11		0.0%
Maximum Off-site	Nickel	7440-02-0	hazard quotient (inhalation)	3.4E-04	1%		5.8E-06		0.01%

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk before	**Industrial Worker total risk before**	linear adjustment to inhalation risk	**Industrial Worker total risk after**	% of total risk after adjusting
Autoliv	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	6.9E-08	83%	8.3E-08	3.5E-09	**1.6E-08**	21.9%
Autoliv	Nickel	7440-02-0	cancer risk (inhalation)	1.4E-09	2%		2.3E-11		0.15%
North Plant Main Adm	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.4E-08	83%	2.9E-08	1.2E-09	**5.6E-09**	21.5%
North Plant Main Adm	Nickel	7440-02-0	cancer risk (inhalation)	4.8E-10	2%		8.2E-12		0.15%
South Plant Main Adm	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	5.8E-08	83%	6.9E-08	2.9E-09	**1.3E-08**	21.9%
South Plant Main Adm	Nickel	7440-02-0	cancer risk (inhalation)	1.2E-09	2%		2.0E-11		0.15%
Maximum On-site	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	9.9E-08	84%	1.2E-07	4.9E-09	**2.2E-08**	22.0%
Maximum On-site	Nickel	7440-02-0	cancer risk (inhalation)	2.0E-09	2%		3.3E-11		0.15%

Receptor Name	COPC Name	CAS Number	Pathway	HI	% of total risk before	**Industrial Worker total HI before**	linear adjustment to inhalation risk	**Industrial Worker total HI after**	% of total risk after adjusting
Autoliv	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	2.3E-05	0%	**2.4E-02**	1.2E-06	**2.3E-02**	0.0%
Autoliv	Chromium	7440-47-3	hazard quotient (inhalation)	5.3E-10	0%		2.7E-11		0.0%
Autoliv	Nickel	7440-02-0	hazard quotient (inhalation)	1.6E-04	1%		2.8E-06		0.01%
North Plant Main Adm	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	8.1E-06	0%	**8.4E-03**	4.0E-07	**8.3E-03**	0.0%
North Plant Main Adm	Chromium	7440-47-3	hazard quotient (inhalation)	1.9E-10	0%		9.3E-12		0.0%
North Plant Main Adm	Nickel	7440-02-0	hazard quotient (inhalation)	5.8E-05	1%		2.9E-06		0.03%
South Plant Main Adm	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	1.9E-05	0%	**2.0E-02**	9.7E-07	**2.0E-02**	0.0%
South Plant Main Adm	Chromium	7440-47-3	hazard quotient (inhalation)	4.5E-10	0%		2.2E-11		0.0%
South Plant Main Adm	Nickel	7440-02-0	hazard quotient (inhalation)	1.4E-04	1%		6.9E-06		0.04%
Maximum On-site	Chromium, hexavalent	18540-29-9	hazard quotient (inhalation)	3.3E-05	0%	**3.3E-02**	1.6E-06	**3.3E-02**	0.0%
Maximum On-site	Chromium	7440-47-3	hazard quotient (inhalation)	7.6E-10	0%		3.8E-11		0.0%
Maximum On-site	Nickel	7440-02-0	hazard quotient (inhalation)	2.4E-04	1%		1.2E-05		0.04%

#	Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
1	Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.7E-07	49%	3.4E-07	8.4E-09
2	Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk milk	1.3E-11	0.004%		
3	Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk beef	2.7E-12	0.001%		
4	Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	1.9E-12	0.001%		
5	Adams Ranch	Chromium, hexavalent	18540-29-9	cancer risk soil	2.7E-14	0.000%		

#	Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
1	Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	4.8E-08	49%	9.9E-08	2.4E-09
2	Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk milk	3.3E-12	0.003%		
3	Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk beef	7.2E-13	0.001%		
4	Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	4.9E-13	0.000%		
5	Christensen Ranch	Chromium, hexavalent	18540-29-9	cancer risk soil	7.0E-15	0.000%		

#	Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
1	Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.7E-08	46%	3.6E-08	8.3E-10
2	Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk milk	1.3E-12	0.004%		
3	Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk beef	2.9E-13	0.001%		
4	Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	2.0E-13	0.001%		
5	Howell Dairy	Chromium, hexavalent	18540-29-9	cancer risk soil	2.9E-15	0.000%		

#	Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
1	bluecrk	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.4E-07	50%	6.7E-07	1.7E-08
2	bluecrk	Chromium, hexavalent	18540-29-9	cancer risk milk	3.0E-11	0.004%		
3	bluecrk	Chromium, hexavalent	18540-29-9	cancer risk beef	6.5E-12	0.001%		
4	bluecrk	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	4.5E-12	0.001%		
5	bluecrk	Chromium, hexavalent	18540-29-9	cancer risk soil	6.4E-14	0.000%		

#	Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
1	bound 2	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.2E-07	50%	2.5E-07	6.2E-09
2	bound 2	Chromium, hexavalent	18540-29-9	cancer risk milk	8.7E-12	0.003%		
3	bound 2	Chromium, hexavalent	18540-29-9	cancer risk beef	1.9E-12	0.001%		
4	bound 2	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	1.3E-12	0.001%		
5	bound 2	Chromium, hexavalent	18540-29-9	cancer risk soil	1.9E-14	0.000%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
bound1	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.2E-07	49%	6.5E-07	1.6E-08
bound1	Chromium, hexavalent	18540-29-9	cancer risk milk	2.5E-11	0%		
bound1	Chromium, hexavalent	18540-29-9	cancer risk beef	5.4E-12	0%		
bound1	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	3.7E-12	0%		
bound1	Chromium, hexavalent	18540-29-9	cancer risk soil	5.3E-14	0%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
bound 3	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.1E-08	49%	6.4E-08	1.6E-09
bound 3	Chromium, hexavalent	18540-29-9	cancer risk milk	2.7E-12	0%		
bound 3	Chromium, hexavalent	18540-29-9	cancer risk beef	6.0E-13	0%		
bound 3	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	4.1E-13	0%		
bound 3	Chromium, hexavalent	18540-29-9	cancer risk soil	5.8E-15	0%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
bound 4	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	3.3E-08	48%	6.9E-08	1.7E-09
bound 4	Chromium, hexavalent	18540-29-9	cancer risk milk	2.4E-12	0%		
bound 4	Chromium, hexavalent	18540-29-9	cancer risk beef	5.4E-13	0%		
bound 4	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	3.7E-13	0%		
bound 4	Chromium, hexavalent	18540-29-9	cancer risk soil	5.3E-15	0%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	2.4E-08	49%	5.0E-08	1.2E-09
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk milk	2.2E-12	0%		
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk beef	4.8E-13	0%		
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	3.3E-13	0%		
holmgren ranch	Chromium, hexavalent	18540-29-9	cancer risk soil	4.7E-15	0%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
Penrose	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.5E-08	47%	3.2E-08	7.5E-10
Penrose	Chromium, hexavalent	18540-29-9	cancer risk milk	1.5E-12	0%		
Penrose	Chromium, hexavalent	18540-29-9	cancer risk beef	3.4E-13	0%		
Penrose	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	2.3E-13	0%		
Penrose	Chromium, hexavalent	18540-29-9	cancer risk soil	3.3E-15	0%		

Receptor Name	COPC Name	CAS Number	Pathway	Risk	% of total risk	Farmer Adult total risk	linear adjustment to inhalation risk
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk (inhalation)	1.8E-08	48%	3.7E-08	8.9E-10
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk milk	1.2E-12	0%		
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk beef	2.5E-13	0%		
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk above ground vegetables	1.7E-13	0%		
Thatcher	Chromium, hexavalent	18540-29-9	cancer risk soil	2.5E-15	0%		

TRACE METAL ANALYSIS
ICP-OES

LWI : L14030138
ORIGINATOR: Greg Anderson
MATERIAL: Aluminum Powder
Lot 7228-0181 and Lot 7228-0191

DATE: 4-Apr-14
ANALYST: M.T. Burnett

	ICP-OES													ICP-MS
	Ca	Co	Cr	Cu	Fe	Mg	Mn	Na	Ni	Si	Ti	V	Zn	Cr
Sample ID	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
Lot 7228-0181	21.0	1.71	**2.67**	23.7	889	23.2	10.2	107	21.5	573	29.7	69.2	20.7	**3.06**
Lot 7228-0181	23.2	1.66	**2.56**	25.2	874	32.7	9.99	116	21.4	543	29.4	68.7	17.1	**3.11**
Lot 7228-0181	34.1	1.64	**2.60**	23.4	888	25.0	10.1	139	21.5	578	29.8	68.9	32.6	**3.08**
Lot 7228-0191	20.7	2.45	**2.77**	14.4	980	23.3	10.4	167	29.1	569	38.6	87.3	19.4	**3.10**
Lot 7228-0191	65.9	2.38	**2.69**	14.9	993	43.8	10.5	444	29.1	566	40.3	87.0	23.7	**3.06**
Lot 7228-0191	19.6	2.34	**2.96**	14.5	987	23.0	10.4	120	28.6	574	39.0	86.9	32.4	**2.98**

Memorandum

R&D-CY14-0256

Aerospace Systems
P.O. Box 707
Brigham City, UT 84302-0707

Date:	07 April 2014	From:	Michael T Burnett
Subject:	Analyize for Cr in Aluminum Powder by ICP-OES and ICP-MS	Organization:	Research and Development 3300
To:	Gregory A Anderson	M/S:	245A
CC:	Michael O Killpack, Russ S Bennett	Extension:	435/863-2744
LWI:	L14030138	Procedure:	LTP-3330-1397
Proj./Task:	R006 B999W	Instrument ID:	ICP-OES & ICP-MS
SDG:	SDG-14030051	Reviewed By:	Chad Saunders

Both the ICP-OES and ICP-MS instruments were used to determine the chromium content from two samples of aluminum powder. Triplicate runs were analyzed from each lot on both instruments with the analytical data compared one to another.

The aluminum powder samples were put into solution by incorporating an acid digestion using 10 mL of concentrated nitric acid. The sample solutions were heated in an Environmental Express Hot Block heating apparatus and allowed to digest / reflux for approximately one hour. Upon cooling, the samples were then diluted to 50 mL with distilled water.

The prepared solutions were analyzed using a Perkin Elmer 8300DV ICP-OES and a Perkin Elmer Elan 6000 ICP-MS. Calibration of the instruments were accomplished using standards made from NIST traceable reference standards and confirmed with an independently certified quality control standard.

The chromium concentration that was analyzed by the ICP-OES showed very similar results to the chromium concentration obtained by ICP-MS. The table below shows the average analytical results.

Sample ID	Cr by ICP-OES	Cr by ICP-MS
Lot 7228-0181	2.61 ug/g	3.08 ug/g
Lot 7228-0191	2.81 ug/g	3.05 ug/g

The attached analytical results show all of the trace metals found in the aluminum powder that were observed by ICP-OES. If you have any questions or concerns, please contact me at ext. 2744.

Mike Burnett

Memorandum

R&D-CY15-0310

Flight Systems Group

Date:	04 May 2015	From:	Jeremy J Hatch
Subject:	The Fate of Nickel and Chromium in Rocket Propellant Combustion Products	From Organization:	Research and Development 3300
To:	Paul V Hancock	M/S	UT40-301
CC:	Lou Cannizzo, Michael O Killpack, Reed J Blau	From Telephone:	435/863-2726

A survey of the literature was conducted in order to determine the potential fate of trace amounts of nickel and chromium within the aluminum component of solid rocket motors; specifically, whether or not these trace metals are incorporated into the alumina combustion product. While the majority of researchers were uninterested in these metals, some research is presented where nickel and/or chromium were specifically added to propellant mixtures, and the fate of the respective metal is investigated. These studies suggest that the likely fate of these two contaminants are oxidized species (for example, nickel (II) oxide, chromate or dichromate salts [present as Cr(VI)]) although there is evidence to support the existence of nickel or chromium aluminides. Studies where nickel or chromium species were specifically found indicate that these species are present in a solid mixture of aluminum compounds including aluminum chlorides/oxides/nitrides (primarily aluminum oxides). Several of the studies do not specify what speciation of nickel or chromium was under investigation only that the authors looked for the presence of the element. Precedent for incorporation of trace metals in an aluminate spinel structure is also presented.

Xiao-Bin Zhao and Xiao-Ping Zhang studied the decomposition of GAP/AN propellants and the role that nickel played in the process. Their experimental set-up used a combustion chamber which was pressurized with nitrogen for the burning of propellant samples. The results of their study show that the nickel (II) oxide stabilizer reacts to form nickel (II) nitrate which then decomposes back to nickel (II) oxide.[1]

Oak Ridge National Laboratory produced a report on the characterization of combustion products for four different propellant formulations used for Roland, Viper, Hellfire, and MLRS weapons systems: D – double-base propellant, H – double-base propellant with ammonium perchlorate, L – 75% ammonium perchlorate/ remainder PVC, Q – 66% HMX, 11% nitroglycerine and 11% triol tinitrate. Test rockets were fired in a climatic chamber operated at 70° F and 60% RH. The researchers were screening for combustion species that have been identified in rocket motor exhaust including trace metals. The test motors were burned in a chamber wherein the exhaust gasses were measured in real time and the particulate matter was

collected on membrane filters; trace metal analysis was performed by inductively coupled plasma-atomic emission spectroscopy or atomic absorption spectroscopy. They do not report on nickel content; however they show that there is a small amount of chromium present in some of their test firings. Of the four test firings per formulation the highest concentration of chromium detected was 0.64 mg/m^3.[2] They do not report the form or oxidation state of the chromium detected; however, if the species was of low molecular weight, the concentration reported would be in the range of hundreds of parts per billion.

Xiong-Gang Wu and coworkers looked at the pyrochemical properties of micron-sized metal particles in double based propellants, including aluminum, nickel, and magnesium/aluminum alloy additives, at various pressures. As a note, the aluminum and magnesium/aluminum used by the researchers was of a typical reagent grade (99.5% -99.8%) which contains trace amounts of nickel and chromium as well as other metals. Surface analysis of the combustion products was accomplished using SEM/EDS and XRD techniques. For propellant samples with added nickel particles, the researchers show that the surface of condensed the combustion products contains approximately 13% by area nickel; the remaining composition consisted mostly of carbon, nitrogen and oxygen (~64%). The nickel was reported in the form of both elemental nickel and nickel (II) oxide. In the case of the propellants with added aluminum (either Al or Mg/Al), no trace impurities of either nickel or chromium were reported in the surface analysis. While the researchers were not specifically looking for these contaminants, the existence of peaks in the XRD pattern would have been noted. In the case of nickel specifically, there are no observable peaks in the comparison of the XRD patterns between the known nickel containing propellant and the other propellants.[3]

Toner explored the particulates contained in the plume from the firing of a Minuteman SR19 II rocket.[4] The particulate matter was analyzed using aerosol time-of-flight mass spectrometry which analyzes individual particle size and composition. The purpose of this research was to determine the chemical make-up and characterization of the particulate matter given off by rocket motor firing. The results of the particle analysis lead to 12 different classifications based on chemical composition finger printing. The results of this method were compared with a previous study done by D. J. Cziczo and colleagues who studied the particulate matter from the firing of an Athena II rocket motor utilizing particle analysis by laser mass spectrometry.[5] Collection of the particulate matter and general analysis was similar to that of Toner's research. In both studies the presence of nickel and/or chromium was not considered in the elemental analysis of individual particles and is thus absent from any of the classifications even though the instrument is sensitive enough to detect very small quantities (order of parts per trillion). Of note, there is an "unclassified" particle category which may include particles with other trace metals which makes-up less than 1% of the total particles analyzed using either method.

Filatov and Naiborodenko investigated the combustion products for nickel-aluminum thermites in a constant pressure bomb under an inert atmosphere. Using XRD and metallurgical analysis the authors show that the combustion products are made up of nickel, alumina and four different nickel aluminides. The formation of the various products was governed by the original ratio of components, temperature and equilibrium constants of the products formed.[6]

The likelihood that trace metals are integrated within the alumina combustion products is a distinct possibility. Evidence for the existence of such metal aluminate species is abundant; corundum (the sapphire gemstone) is one example, composed of chromium aluminate. In order for a metal aluminate to form, several conditions must be met: the elements must come in contact with each other, there must be enough energy available for the reaction to proceed, and the

product must be stable or energetically favorable. As for the first requirement, trace nickel and chromium start out entrained within the aluminum particles of the propellant. The studies by Toner[4] and Cziczo[5] show that iron is present in a majority of the alumina combustion condensates. This result is interesting because the iron source is from the catalyst which exists as separate particles from the aluminum within the propellant. Also, within their results, there are no free iron or iron oxide particles[4,5], thus showing a propensity for the iron to combine with the alumina which lends weight to the idea that other metals may show the same preference. The second condition is easily met by the exothermic nature of the fuel's combustion as demonstrated by the temperature at which the motor operates, in excess of 2700° C. At this temperature all of the metals in question as well as their respective oxides exist in the liquid state allowing for intimate mixing and reacting. Under these conditions, formation of the metal aluminate is more thermodynamically favorable than any of the metal oxides.[7] Further, Bolt and colleagues demonstrate that alumina coated with nickel (II) oxide forms a nickel aluminate when annealed at 1200° C (a solid state reaction requiring significantly less energy).[8] As for the third requirement, the stability of both nickel aluminates and chromium aluminates is demonstrated by their natural abundance in several minerals and their use as high temperature catalysts in industy.[8-10] While these investigations do not originate with solid rocket motor propellant, they do give precedent to the formation of metal aluminates as condensed combustion products.

Based on the survey of literature, it appears that the ultimate fate of both nickel and chromium within rocket motor exhaust is as part of an agglomerate of multiple metal oxides/chlorides. By far, the most prevalent species of particle reported-on are alumina mixtures. It is probable that the metals of interest would reside in such mixtures, although no reports on the surface speciation of such particles were discovered. However, there is evidence that nickel and chromium will exist in an oxidized state or as an aluminide/aluminate in conjunction with the alumina. The collection of work presented above provides a beginning to the understanding of the fate of nickel and chromium contaminants within the aluminum component of solid rocket fuels. As stated previously, the composition of products is dependent on several factors including the ratio of components and atmospheric conditions. Further investigation will be needed in order to make a final determination as to the eventual fate of either metal.

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From: Sastry, Chandra [chandra.sastry@urs.com]
Sent: Wednesday, October 19, 2011 9:33 AM
To: Palmer, Blair
Subject: RE: Question on SO2 data in our ODOBi testing

Our notes from the testing indicate that it was made from stainless steel .

Chandra

Chandramouli Sastry
URS Corporation,
1093 Commerce Park Drive, Suite 100
Oak Ridge, TN 37830.

Tel: 865-220-8125

From: Palmer, Blair [mailto:Blair.Palmer@ATK.com]
Sent: Wednesday, October 19, 2011 11:30 AM
To: Sastry, Chandra
Subject: RE: Question on SO2 data in our ODOBi testing

Thanks Chandra. This information is very helpful. Do you recall if the tray was made from stainless steel? I just remember what appeared to be a bright shiny new tray.
Thanks,
Blair

From: Sastry, Chandra [mailto:chandra.sastry@urs.com]
Sent: Wednesday, October 19, 2011 9:11 AM
To: Palmer, Blair
Cc: Carson, John R
Subject: RE: Question on SO2 data in our ODOBi testing

Blair, I have some answers:

1) 38 grams of black powder and a squib was used to detonate the items.
2) The exact formulation of the black powder is not available. Our notes say that it was smokeless black powder. However, a typical black powder composition is 74% potassium nitrate, 15.6% charcoal, and 10.4% sulfur.
3) Our recollection on the initiation wire is that it was some form of a nichrome wire that would get hot when electricity passes through – like the wire in a heat gun. I did not find anything in our notes on this.
4) We don't recall the stainless steel pan being anything fancy – it was just a regular tray. I think the Dugway folks found one in their labs for your tests.

Chandra

Chandramouli Sastry
URS Corporation,
1093 Commerce Park Drive, Suite 100
Oak Ridge, TN 37830.

Tel: 865-220-8125

From: Palmer, Blair [mailto:Blair.Palmer@ATK.com]
Sent: Tuesday, October 18, 2011 10:10 AM
To: Sastry, Chandra
Cc: Carson, John R
Subject: RE: Question on SO2 data in our ODOBi testing

Thanks Chandra and John, that does help. I also have a couple of other questions:

1) What was the size (g or mg) of the black powder squib that was used for ignition?
2) Any idea exactly what black powder formulation was used?
3) Also the initiation wire, what was this made of, it seems like we have discussed this before?
4) Last question, I remember the test samples being burned in a small, new, stainless steel tray that was constructed for ATK. Do you have any information on this?

Any information on these questions would be helpful. I appreciate your help.
Thanks,
Blair

From: Sastry, Chandra [mailto:chandra.sastry@urs.com]
Sent: Friday, October 14, 2011 2:14 PM
To: Palmer, Blair
Cc: Carson, John R
Subject: RE: Question on SO2 data in our ODOBi testing

Blair,

John forwarded your request to me and I went back and looked at the CEMS data from the ODOBi testing. The SO2 CEMS was calibrated for a 0 – 30 ppm range during those tests and the measured values during each test were within 0 – 12% of the calibrated range of the instrument. In fact, a majority of the measured values were within 0 – 2% of the calibrated range. See the graph below.

When EPA test methods 6C , 7E etc. (instrumental methods aka CEMS) are used to measure SO2, NOX, etc. the instruments are typically ranged so that a majority of the measured values are within 20 -80% of the calibrated range of the instrument. Hence we made the comment that "SO2 levels were too low to be reliably measured".

Hope this helps.

Chandra

Description: cid:image001.png@01CC8DAF.3171B330

Chandramouli Sastry
URS Corporation,
1093 Commerce Park Drive, Suite 100
Oak Ridge, TN 37830.

Tel: 865-220-8125

From: Carson, John R
Sent: Friday, October 07, 2011 4:56 PM
To: Sastry, Chandra
Subject: FW: Question on SO2 data in our ODOBi testing

Can we help Blair with this?

Note: new email address

John R. Carson
URS Corporation
1093 Commerce Park Drive, Suite 100
Oak Ridge, TN 37830-8029
Phone: (865) 220-8103
Fax: (865) 483-9061
E-mail: john.r.carson@urs.com

From: Palmer, Blair [mailto:Blair.Palmer@ATK.com]
Sent: Friday, October 07, 2011 2:27 PM

To: Carson, John R
Subject: Question on SO2 data in our ODOBi testing

Hello John:
Hope all is going well for you and your family. I have a question relating to our ODOBi testing and SO2. In our report Volume I Summary Report, section 5, page 32, it states that "SO2 levels were too low to be reliably measured." SO2 is giving us some problems in our modeling showing us exceeding the NAAQS. I don't have any experience with CEMs and their reliability. Do you have any information regarding SO2 and the other compounds that were measured by the CEMs from our testing, and information behind the statement "SO2 levels were too low to be reliably measured?" Any information would be helpful.
Thank you,

Blair Palmer
Environmental Engineer
ATK Launch Systems, Inc.
435-863-2430

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Review

Assessment of the mode of action for hexavalent chromium-induced lung cancer following inhalation exposures

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ABSTRACT

Inhalation of hexavalent chromium [Cr(VI)] is associated with increased lung cancer risk among workers in several industries, most notably chromate production workers exposed to high concentrations of Cr(VI) ($\geq$100 μg/m^3), for which clear exposure–response relationships and respiratory irritation and tissue damage have been reported. Data from this industry are used to assess lung cancer risk associated with environmental and current occupational exposures, occurring at concentrations that are significantly lower. There is considerable uncertainty in the low dose extrapolation of historical occupational epidemiology data to assess risk at current exposures because no published or well recognized mode of action (MOA) for Cr(VI)-induced lung tumors exists. We conducted a MOA analysis for Cr(VI)-induced lung cancer evaluating toxicokinetic and toxicological data in humans and rodents and mechanistic data to assess plausibility, dose–response, and temporal concordance for potential MOAs. Toxicokinetic data support that extracellular reduction of Cr(VI), which limits intracellular absorption of Cr(VI) and Cr(VI)-induced toxicity, can be overwhelmed at high exposure levels. *In vivo* genotoxicity and mutagenicity data are mostly negative and do not support a mutagenic MOA. Further, both chronic bioassays and the epidemiologic literature support that lung cancer occurs at exposures that cause tissue damage. Based on this MOA analysis, the overall weight of evidence supports a MOA involving deposition and accumulation of particulate chromium in the bifurcations of the lung resulting in exceedance of clearance mechanisms and cellular absorption of Cr(VI). Once inside the cell, reduction of Cr(VI) results in oxidative stress and the formation of Cr ligands. Subsequent protein and DNA damage lead to tissue irritation, inflammation, and cytotoxicity. These effects, concomitant with increased cell proliferation, result in changes to DNA sequences and/or methylation status that can lead to tumorigenesis. This MOA supports the use of non-linear approaches when extrapolating lung cancer risk occurring at high concentration occupational exposures to environmentally-relevant exposures.

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1. Introduction

Inhalation of hexavalent chromium [Cr(VI)] is associated with increased lung cancer risk based on numerous observations in occupational epidemiology studies (IARC, 1990). The increase in lung cancer risk has been observed among workers in chromate production, plating, pigments and ferrochrome production industries where historical exposures to Cr(VI) have been well in excess of 100 $\mu g/m^3$. Among workers with increased lung cancer risk, nasal irritation and perforation have also been reported (Gibb et al., 2000a; IARC, 1990; Luippold et al., 2003). Consistently, based on animal data collected over several decades, it has been argued that the carcinogenicity of Cr(VI) is associated with tissue damage and inflammation induced by high dose exposure to bronchial tissues or microenvironments within the lung (Steinhoff et al., 1986; Levy et al., 1986; Glaser et al., 1990; Beaver et al., 2009b). Although the mode of action (MOA) for Cr(VI)-induced lung tumors has not been established to date, these observations would generally support a non-mutagenic MOA with a threshold for carcinogenicity.

The cancer risk assessment for chemicals that act by a mutagenic MOA are typically quantified assuming no threshold for carcinogenicity (U.S. EPA, 2005), and Cr(VI) has been observed to be genotoxic and mutagenic *in vitro* and *in vivo* by non-natural exposure routes (*e.g.*, intraperitoneal injection) and at highly toxic doses. Although Cr(VI) demonstrates very limited genotoxicity *via* natural routes of exposure and at environmentally-relevant levels (Holmes et al., 2008; Nickens et al., 2010; Thompson et al., 2013), some have concluded that the MOA of Cr(VI)-induced cancers, regardless of the tumor location, is mutagenicity wherein Cr(VI) induces mutations early in the carcinogenic process (McCarroll et al., 2010; Zhitkovich, 2011). Others have suggested that Cr(VI)-induced carcinogenesis arise from epigenetic changes due to increase in genomic instability characterized by chromosomal instability and/or microsatellite instability (MSI) from loss or hindrance of DNA mismatch repair (MMR) genes (Holmes et al., 2008; Nickens et al., 2010).

Risk assessments for Cr(VI)—particularly those conducted for the purposes of setting regulatory guidelines—have mostly relied upon linear low-dose extrapolation based on the conclusion that Cr(VI) may act by a non-thresholded genotoxic mechanism (Seidler et al., 2013; NIOSH, 2013; OSHA, 2006). It should be noted that DNA reactivity, such as the formation of DNA adducts, is not equivalent to mutagenicity. Chemicals that are DNA reactive do not necessarily induce tumors from direct DNA interactions; thus, considering the potential MOAs for Cr(VI)-induced lung tumors, evidence for DNA reactivity should not be taken as specifically supporting a mutagenic MOA.

The United States Environmental Protection Agency (EPA) Cancer Guidelines (U.S. EPA, 2005) as well as the Agency's draft Framework for Determining a Mutagenic Mode of Action for Carcinogenicity (U.S. EPA, 2007) emphasized that a weight of evidence approach should be applied for determining the MOA for carcinogenicity. An observation of mutation in one mutation assay is not sufficient for concluding that a chemical causes specific tumors by a mutagenic MOA or that the mutations is the only key event in the carcinogenic process (U.S. EPA, 2007). Not all carcinogenic chemicals that can interact with DNA will act by a mutagenic MOA, in which mutagenicity must be an obligatory early action of the chemical that precedes other key events such as cytotoxicity and regenerative proliferation in the carcinogenic process (U.S. EPA, 2007).

Risk assessment approaches for inhalation exposure to Cr(VI) have typically relied on epidemiologic data from occupational exposure in the chromate production industry, and linear models have been used to extrapolate from high concentration occupational exposures to much lower levels for the purpose of risk assessment (OSHA, 2006; NIOSH, 2013; U.S. EPA, 1984; Crump et al., 2003; Park et al., 2004; Seidler et al., 2013; Haney et al., 2014). These assessments either did not consider MOA or assumed that Cr(VI) acted by a mutagenic or genotoxic MOA and that no threshold for carcinogenicity exists or can be measured. However recently, a non-linear cancer risk assessment for inhaled Cr(VI) was developed based on evidence supporting that Cr(VI)-induced lung cancers may be thresholded due to kinetic detoxification at low exposures (Haney et al., 2012). In this paper, a kinetic threshold for Cr(VI) was quantified based on the reductive capacity of the lung and used with epidemiologic data for lung cancer to propose a chronic inhalation reference value of 0.24 $\mu g/m^3$. This value was developed to be protective of lung cancer for continuous environmental exposures and was reported to be 300-fold higher than an equivalent value calculated using linear low-dose extrapolation for an increased risk of 1 in 100,000 (Haney et al., 2012).

Given the divergent MOA opinions and approaches to risk assessment in the regulatory and scientific literature, a rigorous examination of a plausible MOA for lung tumors is important for informing the low-dose extrapolation of cancer risk assessment for Cr(VI). Thus, we conducted a MOA analysis for Cr(VI)-induced lung cancer with the available kinetic, human, animal, and mechanistic data. Based on the modified Hill Criteria outlined in

EPA's cancer risk assessment guideline (U.S. EPA, 2005), plausibility, dose–response, and temporal concordance for potential MOAs were assessed and data gaps were identified.

2. Cr(VI) biochemistry and reduction mechanisms

Cr(VI) enters the cells through anion transporters, whereas Cr(III) enters through passive diffusion; as such, extracellular reduction of Cr(VI) to Cr(III) serves as a well-recognized detoxification process (De Flora, 2000; De Flora et al., 1997; U.S. EPA, 1998). Biologic fluids such as saliva, gastric juice, and epithelial-lining fluids reduce Cr(VI) to Cr(III) (De Flora, 2000). In addition, Cr(VI) is also reduced to Cr(III) by microorganisms, isolated cells (*e.g.*, red blood cells and bronchoalveolar lavage cells), and tissues (*e.g.*, liver, lung parenchyma, stomach, intestine) (De Flora, 2000). It is expected that the capacity for detoxification by reduction in the lung is not as great as that for ingestion, which has been estimated as 84–88 mg Cr(VI) per day (De Flora et al., 1997). The reducing capacity of alveolar epithelial lining fluid was estimated to range from 0.9 to 1.8 mg Cr(VI) per individual, and the overall reduction capacity for pulmonary alveolar macrophages and peripheral lung parenchyma cells per individual was estimated as 136 and 260 mg, respectively (De Flora et al., 1997) (Fig. 1). However, the lung offers significant surface area for deposition and absorption, as compared to the stomach, and it is thought that inhaled Cr(VI) may be accumulated in microenvironments of the lung bronchi resulting in deposits that can overwhelm local reductive capacity (Beaver et al., 2009b). Carcinogenicity of inhaled Cr(VI) is generally thought to be limited to the portal of entry in the respiratory tract (ATSDR, 2012; IARC, 1990). Because Cr(VI) reduction is concentration-dependent and capacity-limited, more Cr(VI) is available for intracellular absorption and toxicity at exposures that saturate reductive capacity (De Flora et al., 1987; Kirman et al., 2012; Proctor et al., 2012).

Within the cell, reduction of Cr(VI) to Cr(III) is mediated primarily by binding to low molecular weight thiols (*e.g.*, GSH), antioxidants (*e.g.*, ascorbate), and macromolecules (*e.g.*, proteins) (De Flora et al., 1985; O'Brien et al., 2003; Zhitkovich, 2005). As Fig. 1 presents, intracellular reduction of Cr(VI) to Cr(III) can lead to binary [Cr(III)-ligand] and ternary [ligand-Cr(III)-ligand] complexes [*e.g.*, GSH-Cr(III)-GSH]. The abundance of cytoplasmic macromolecules suggests that cytoplasmic Cr(III) ternary ligands represent inactive chromium species (Petrilli and De Flora, 1982). Reduction of Cr(VI) can also lead to the formation of less stable intermediates such as Cr(V) and Cr(IV), and thiol radicals (O'Brien et al., 2003; Yao et al., 2008). Molecular oxygen can also reduce Cr (VI) to Cr(V) thereby generating reactive oxygen species (ROS) (Liu and Shi, 2001), which in turn can lead to the formation of hydrogen peroxide. Binary Cr-DNA adducts are estimated to represent more than 75% of all Cr-DNA adducts (including both binary and ternary), but are likely to have weaker mutagenic potential than ternary adduct (Zhitkovich, 2011). Ternary Cr-DNA adducts may be more mutagenic, as these lesions can lead to DNA double strand breaks (Nickens et al., 2010; Zhitkovich, 2011). *In vitro* evidence suggests that Cr(VI)-induced DNA lesions are repaired by base excision repair (BER), nucleotide excision repair (NER), and mismatch repair (MMR) pathways (Nickens et al., 2010; O'Brien et al., 2009).

3. Brief review of Cr(VI) genotoxicity *in vitro*

Genotoxicity is used broadly to describe genetic damage that can result from both mutagenic and nonmutagenic processes; hence, genotoxicity is not equivalent to mutagenicity. In the draft Framework for Determining a Mutagenic Mode Of Action for Carcinogenicity, EPA indicated that "for a chemical to act by a mutagenic MOA, either the chemical or its direct metabolite is the agent inducing mutations that initiate cancer" (U.S. EPA, 2007). Evaluations of data on both genotoxic and mutagenic effects of a chemical are necessary to ensure a comprehensive mutagenicity assessment (U.S. EPA, 2007). Reviews of Cr(VI) genotoxicity have been reported elsewhere (Chiu et al., 2010; Holmes et al., 2008; Nickens et al., 2010; Thompson et al., 2013; Zhitkovich, 2011), and thus, comprehensive evaluation of *in vitro* genotoxicity of Cr(VI) is not presented here. Despite evidence of Cr(VI) genotoxicity *in vitro*, several expert members of a peer-review panel of EPA's Draft Toxicological Review for Hexavalent Chromium characterized the mutagenicity of Cr(VI) as 'weak' at best (ERD, 2011).

Cr(VI) has been characterized as having only modest mutagenic activity in bacterial systems (Petrilli and De Flora, 1982). In *Salmonella typhimurium* (TA 100) and *Escherichia coli*, Cr(VI) has

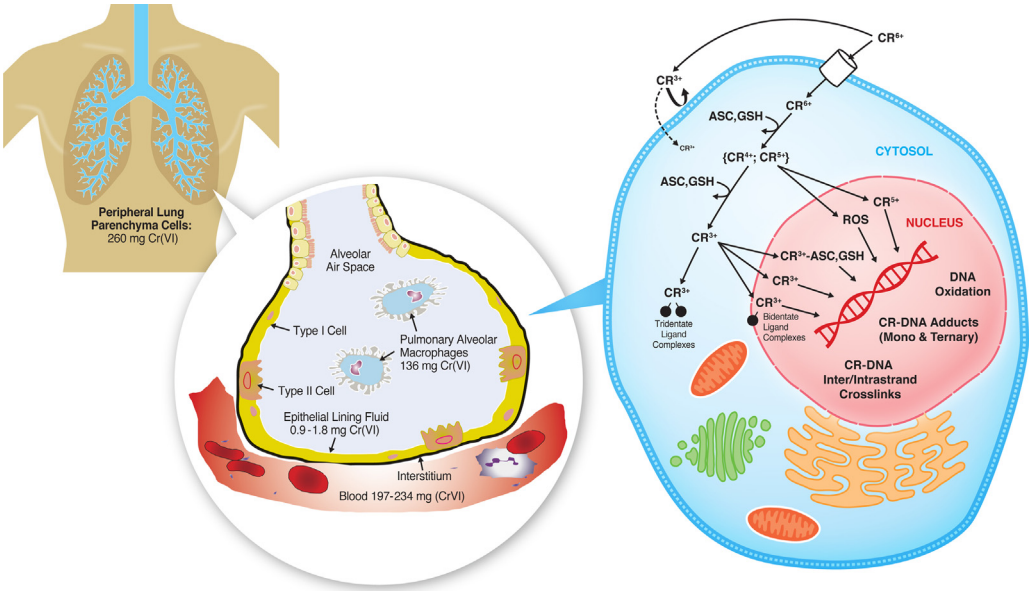

Fig. 1. Estimates of overall Cr(VI) reducing capacity per individual (De Flora et al., 1997) and hypothesized Cr(VI) biochemistry in the lung.

been shown to increase reversions (*i.e.*, mutations); however, mutation formation is mitigated by the addition of microsomal S9 (De Flora, 1978; NTP, 2008b; Petrilli and De Flora, 1978a,b). In addition, the number of Cr(VI)-induced revertants in TA100 were much lower than the positive control sodium azide in the NTP (2007) study further indicating the weak mutagenic potential of Cr(VI).

Based on the known chemistry of Cr(VI) reduction, oxidative stress is a very likely mechanism for genotoxicity. TA102 strain, which better detected mutations from oxidants, was shown to be more sensitive to Cr(VI) than eight other *S. typhimurium* strains (Bennicelli et al., 1983). In contrast, the number of Cr(VI)-induced mutants in *E. coli* strain WP2uvrA (equivalent to TA102) were similar to the positive control methyl methanosulfonate. Several recent studies have reported that continuous passage (4–24 weeks) of human bronchial epithelial Beas-2B cells in relatively low concentrations of Cr(VI) (*e.g.*, 0.25–5 μM) can result in transformation (Azad et al., 2010; Sun et al., 2011; Wang et al., 2011), and one study demonstrated that such transformation could be ameliorated by transfection of plasmids containing superoxide dismutase, catalase, or RNA inhibitors of NADPH oxidase (Wang et al., 2011). Cr(VI) has also been shown to induce 8-hydroxydeoxyguanosine (8-OHdG) DNA damage in cultured cells at lower concentrations compared to those that induced DNA double strand break formation (Thompson et al., 2012).

Importantly, Cr(VI) is also reported to induce epigenetic (*e.g.*, microRNA, histone modification, and DNA methylation) changes in cells. For example, treatment of transgenic gpt^+ Chinese hamster V79 fibroblasts with soluble and insoluble chromate induced mutant colonies (Klein et al., 2002). However, whereas the revertants from cells treated with insoluble chromate arose from gpt deletions, the revertants from cells treated with soluble chromate arose from gpt silencing due to hypermethylation of the gpt promoter region (Klein et al., 2002). Similarly, cellular methylation of histone H3 lysine 9 (H3K9) was increased, and mRNA levels of MLH1 were decreased in A549 cells treated with Cr(VI) (Sun et al., 2009). In addition, cells deficient in MMR were resistant to Cr(VI)-induced toxicity (Peterson-Roth et al., 2005), and it has been posited that Cr(VI) might "select" for cells deficient in MMR, which could increase genomic instability (Salnikow and Zhitkovich, 2008). However, repeated passage of Beas-2B cells in low levels of Cr(VI) resulted in cell transformations with different phenotypes (Rodrigues et al., 2009). These different outcomes in different cell models underscore the complexities and limitations associated with extrapolating *in vitro* findings to *in vivo* conditions.

Another method for assessing genotoxicity is the micronucleus (MN) assay, which can detect DNA damage that arises through either clastogenic or aneugenic mechanisms (Kirsch-Volders et al., 2011; OECD, 2010). Studies in human diploid fibroblasts (MRC-5) have indicated that Cr(VI) induces MN through aneuploidic mechanisms (Seoane and Dulout, 2001; Seoane et al., 2002). Recent studies in CHO-K1 and A549 cells indicate that Cr(VI) induces MN only at cytotoxic concentrations (Thompson et al., 2012). An earlier study reported MN in CHO cells; however there was no dose-dependent response and no statistical analyses were presented, and as such these results are highly uncertain (Howard et al., 1992). The strongest evidence for induction of MN *in vitro* comes from studies that first supplement cells with dehydroascorbic acid (DHA) prior to Cr(VI) exposure (Reynolds et al., 2007, 2012). For discussion on potential caveats to using DHA, the reader is referred to several recent publications (Thompson et al., 2012, 2013; Wise and Wise, 2012).

4. Assessment of Cr(VI) genotoxicity *in vivo*

4.1. Oxidative DNA damage

In vivo studies are quite obviously more relevant in the context of human health risk assessment. The evidence for Cr(VI)-induced genotoxicity *in vivo* is relatively weak; many positive findings are indicative of oxidative DNA damage based on nonphysiological doses and exposure routes (Table 1). No significant changes in DNA cross-linking in leukocytes were observed in human volunteers who ingested a bolus dose of 5 mg potassium dichromate in 0.5 L of water (10 mg/L) (Kuykendall et al., 1996). Female SKH-1 hairless mice exposed to 5 and 20 mg Cr(VI)/L in drinking water for 9 months had no significant changes in either DNA protein crosslink or 8-OHdG formation in the forestomach, glandular stomach, or duodenum (De Flora et al., 2008). Several rodent studies involving oral exposures to Cr(VI) have reported positive responses for genotoxicity in bone marrow, liver, brain or blood cells (Bagchi et al., 1995a,b, 1997; Coogan et al., 1991). However, no tumors were reported in these tissues among the rodents tested in the NTP (2008b) bioassay of Cr(VI), and three of the aforementioned studies (Bagchi et al., 1995a,b, 1997) attributed the genotoxicity to oxidative mechanisms, not direct DNA reactivity.

Table 1
Select *in vivo* studies of Cr(VI) genotoxicity[a].

Reference	Species	Cr(VI) dose/exposure concentration	Study findings
Izzotti et al. (1998)	Sprague-Dawley rats	3 consecutive daily intratracheal implantations of 0.25 mg/kg	Increased DNA fragmentation, DPX, nucleotide modification, 8-OH-dG in lungs The authors concluded that observations were consistent with oxidative DNA damage
Dana Devi et al. (2004)	Welders	Not reported	Increases in DNA damage (measured by Comet assay) in blood leukocytes and buccal cells
Gambelunghe et al. (2003)	Cr platers	Not reported	DNA strand breaks in peripheral lymphocytes
Gao et al. (1994)	Dichromate production workers	55 $\mu g/m^3$	No DNA damage in peripheral lymphocytes
Kuykendall et al. (1996)	Human volunteers	Single bolus DW dose of 10 mg/L	No effects on DNA crosslinking in leukocytes
De Flora et al. (2008)	Female SKH-1 mice	5 and 20 mg/L in DW for 9 months	No changes in DPX or 8-OH-dG formation in the forestomach, glandular stomach, or duodenum
Kirpnick-Sobol et al. (2006)	Offspring of pregnant C57BL/6Jp^{un}/^{un} mice	20 or 45 mg Cr(VI)/L or 375 or 750 mg Cr(III)/L, in DW during gestational days 10–20	Cr(III) and Cr(VI) caused significant increases in DNA deletions in the embryos In units of tissue Cr concentration, Cr(III) was three times more potent at causing deletions than Cr(VI)
Coogan et al. (1991)	F344 rats	100 or 200 mg/L in DW for up to 6 weeks	DPX in the liver; negative DPX in the lymphocytes

8-OH-dG: 8-hydroxy-2′-deoxyguanosine.
DPX: DNA protein crosslink.
DW: drinking water.
[a] *In vitro* genotoxicity has been the subject of several recent reviews (Chiu et al., 2010; Holmes et al., 2008; Nickens et al., 2010; Zhitkovich, 2011) and is not further reviewed here. *In vitro* data support that Cr(VI) genotoxicity occurs primarily by oxidative mechanisms.

The NTP (2008b) study findings provide direct evidence that positive results for genotoxicity are not necessarily predictive of carcinogenesis.

Kirpnick-Sobol et al. (2006) examined Cr(VI) and Cr(III) exposures in pregnant mice to either potassium dichromate (62.5 or 125.0 mg/L) or chromium chloride (1875 or 3750 mg/L), respectively, in drinking water during gestational days 10–20. Both Cr(VI) and Cr(III) resulted in significant increases in the frequencies of large-scale DNA deletions in the pups examined at 20 days of age. Notably, embryos exposed to Cr(III) had significant increases in DNA deletions at 3-fold lower chromium tissue concentrations than in embryos exposed to Cr(VI) (Kirpnick-Sobol et al., 2006). Kirpnick-Sobol et al. concluded that although only small amounts of Cr(III) were absorbed, Cr(III) was highly effective at inducing DNA damage. However, the results of this study were not consistent with those of other ingestion studies (NTP, 2008a,b) which indicated that Cr(VI) that is absorbed into the cells is toxic while Cr(III) had limited toxicity. Even at high doses, Cr(III) was not observed to be carcinogenic in cancer bioassays (NTP, 2008a), drawing into question the applicability of the Kirpnick-Sobol et al. results for assessing cancer hazard or the mutagenic potential of chromium.

Workers exposed to Cr(VI) have also been assessed for DNA damage. Increases in DNA damage (measured by Comet assay) in blood leukocytes and buccal cells were reported in welders relative to control subjects (Dana Devi et al., 2004). Chrome platers were observed to have DNA strand breaks in peripheral lymphocytes (Gambelunghe et al., 2003). However, no DNA damage was observed in peripheral lymphocytes obtained from 10 workers at a dichromate production plant in England; the chromium concentrations in the plant ranged from 1 to 55 $\mu g/m^3$ Cr(VI), but most exposures were well below 10 $\mu g/m^3$ (Gao et al., 1994). The results of these studies are uncertain because the exposure levels were often not reported; additionally, co-exposures to other compounds and the small numbers of workers evaluated need to be also considered.

More relevant to the target tissue of interest following Cr(VI) inhalation exposure (*i.e.*, lung), Izzotti et al. (1998) showed that three consecutive days of intratracheal administration of 0.25 mg/kg Cr(VI) (administered as sodium dichromate dihydrate, SDD) increased DNA fragmentation, DNA–protein cross-links, nucleotide modifications, and 8-OH-dG in rat lungs relative to the lungs of sham treated animals. Izzotti et al. concluded that the nucleotide modifications were consistent with oxidative DNA damage; moreover, they showed that oral administration of *N*-acetylcysteine, a precursor of cysteine and GSH, prevented the aforementioned lesions (Izzotti et al., 1998). As Izzotti et al. point out, 0.25 mg/kg dose was not carcinogenic when administered to rats either once or five-times per week for 30 months in a repeated dose study (Steinhoff et al., 1986). These findings suggest that the damage observed in Izzotti et al. (1998) was not likely sufficient to increase cancer following chronic exposure.

4.2. *Micronucleus formation* in vivo

In vivo MN assays in rodents exposed to Cr(VI) *via* gavage or drinking water are generally negative (De Flora et al., 2006; Mirsalis et al., 1996; NTP, 2007; O'Brien et al., 2013; Shindo et al., 1989) (Table 2). NTP conducted four *in vivo* MN tests in peripheral blood erythrocytes of three strains of mice (i.e., B6C3F1, BALB/C, *am3*-C57BL/6) exposed to Cr(VI) for 3 months, and the results were generally negative (NTP, 2007). More recently, mice exposed to 0.1–180 mg/L Cr(VI) for 7 or 90 days did not have increase MN formation in the stem cell compartment of the duodenum (O'Brien et al., 2013).

In vivo MN assays involving i.p. administration are generally positive, but this route of exposure has very limited application for understanding the MOA from typical environmental exposures because it bypasses the detoxification mechanisms by which Cr(VI) is reduced to Cr(III) in extracellular compartments (De Flora, 2000; De Flora et al., 1997). As such, positive genotoxicity results from studies involving i.p. administration are of questionable relevance in elucidating the MOA of Cr(VI)-induced cancers from environmentally-relevant exposure routes (*e.g.*, oral and inhalation). Several studies have compared the MN formation of Cr(VI) by administration in drinking water (or oral gavage) and i.p. injection.

Table 2
In vivo micronucleus (MN) assays of Cr(VI).

Reference	Study subjects or species	Cr(VI) dose/exposure	Study findings
Benova et al. (2002)	Cr platers	Not reported	Increased MN in peripheral lymphocytes and buccal mucosa, but no increase in chromosomal aberrations were detected[a]
Sarto et al. (1990)	16 Cr platers	Not reported	Negative for MN in the buccal mucosa
Vaglenov et al. (1999)	40 Cr platers and 18 controls	43 and 83 $\mu g/m^3$	Increase in MN and number of binucleated cells[b]
NTP (2007)	B6C3F1, BALB/c, *am3*-C57BL/6 mice	20, 45, 90 mg/L in DW for 90 days; BALB/c also tested at 175, 350 mg/L	No increased MN in NCEs/PCEs for B6C3F1 and BALB/c mice all doses Positive for MN in NCEs of male *am3*-C57BL/6 mice at all doses
O'Brien et al. (2013)	B6C3F1 mice	0.1, 1, 5, 20, 60, 180 mg/L in DW for 7 or 90 days[c]	No increase in MN formation in duodenal crypts of the small intestine
De Flora et al. (2006)	8-month old male mice	10 or 20 mg Cr(VI)/L in DW for 20 days	No increased MN in NCEs or PCEs at 5, 12, and 20 days of exposure
	2-month old male mice	5, 50, 500 mg/L in DW for up to 210 days	No increased MN in NCEs after 14, 18, 146 days of exposure
	Pregnant Swiss albino mice and their fetus	5 and 10 mg/L in DW through pregnancy	No increased MN in PCEs of the bone marrow or fetal livers or peripheral blood
Mirsalis et al. (1996)	Swiss–Weber mice	1, 5, 20 mg/L in DW for 48 h or two bolus doses 24 and 48 h prior to sacrifice	No effects on PCEs

PCE: polychromatic erythrocytes.
NCE: normochromatic erythrocytes.
DW: drinking water.
[a] This was the conclusion reached by Nersesyan (2003) regarding the results of Benova et al. (2002).
[b] At these high concentrations, chromic acid causes severe irritation and tissue damage.
[c] 60 and 180 mg/L were carcinogenic in chronic bioassay (NTP, 2008b).

Shindo et al. (1989) exposed two strains of mice (CD-1 and MS/Ae) to several concentrations of Cr(VI) *via* oral gavage and by i.p. injection. In both strains, there was a dose-dependent decrease in polychromatic erythrocytes (PCEs) and an increase in micronucleated PCEs following i.p. administration; with gavage administration, no changes in micronucleated PCEs were observed (Shindo et al., 1989).

De Flora et al. (2006)showed that i.p. administration of 17.7 mg/kg Cr(VI) to 8-month-old male BDF1 mice resulted in a significant increase in micronucleated PCEs, whereas gavage of the same dose did not. Eight-month-old male mice exposed to 10 or 20 mg Cr(VI)/L in drinking water for 20 days showed no increase in micronucleated normochromatic erythrocytes (NCEs) at 5, 12 and 20 days of exposure, or micronucleated PCEs at day 20 (De Flora et al., 2006). De Flora et al. also exposed two-month-old mice to 5, 50, and 500 mg Cr(VI)/L in drinking water for up to 210 days; no changes in micronucleated NCEs were observed after 14, 28, 56 and 146 days of drinking water exposure (De Flora et al., 2006). A slight but statistically insignificant increase was observed in micronucleated PCEs in the highest dose group relative to controls (*i.e.*, 2.38 vs. 1.83% PCE). Pregnant Swiss albino mice exposed to 5 and 10 mg of Cr(VI)/L in drinking water throughout pregnancy showed no significant increase in micronucleated PCEs in the bone marrow; no increases in micronucleated PCEs were found in the livers or peripheral blood of the fetuses. In contrast, mice administered i.p. dose of 50 mg/kg on day 17 of pregnancy exhibited significant increases in bone marrow micronucleated PCEs, and in the liver and peripheral blood of the fetuses (De Flora et al., 2006). Overall, studies comparing micronucleus formation induced by i.p. dosing of Cr(VI) with that for oral exposures demonstrate that results from i.p. dosing cannot be used to predict responses by natural routes of exposure.

Several studies have evaluated MN in tissues and blood of workers exposed to Cr(VI). In Vaglenov et al. (1999), the frequency of MN was measured in peripheral lymphocytes of 40 chromium electroplaters and 18 control subjects in Bulgaria. Relative to controls, blood from exposed workers was found to contain higher levels of total chromium, and a significant increase in the frequency of the total number of MN and the number of binucleated cells carrying MN was reported (Vaglenov et al., 1999). Benova et al. reported increases in MN in lymphocyte and buccal cells from chromium workers; these MN were both centromere positive and negative – suggesting both aneuploidic and clastogenic mechanisms (Benova et al., 2002). However, the findings by Benova et al. have been questioned (Nersesyan, 2003) because increases in chromosomal aberrations, which usually accompany MN, were not detected. Exfoliated buccal and nasal swabs were obtained from 16 electroplating factory workers with exposure to chromic acid and from 9 additional workers exposed to ethylene oxide in a sterilization unit (Sarto et al., 1990). Among the electroplating workers, the urinary total chromium concentrations ranged from 2.5 to 88 μg/g creatinine, suggesting relatively high levels of exposure. The results were negative for MN among Cr(VI)-exposed workers, and the frequency of MN in buccal mucosa was within the norm (Sarto et al., 1990). The MN frequency in nasal mucosa was not altered in chromium platers, whereas a significant increase ($p < 0.01$) in MN was found in 2 of 3 subjects involved in accidental ethylene oxide leakage, and a non-significant increase in MN was found in the group chronically exposed to ethylene oxide. Airborne concentrations of Cr(VI) were not reported in Sarto et al. (1990) and Benova et al. (2002). In Vaglenov et al. (1999), the mean total chromium concentrations were reported to be 43 and 83 $\mu g/m^3$ in low- and high-exposure groups. At these high concentrations of chromic acid, irritation and cytotoxicity in the buccal mucosa are expected, and thus, findings of MN may be indicative of oxidative mechanisms induced by Cr(VI).

4.3. *Mutagenicity* in vivo

In vivo mutation data represent the highest level of evidence in the hierarchy of data needed to establish a mutagenic MOA, and organ-specific data (*e.g.*, observation of genetic damage in the target tissue of the species showing a tumorigenic response) are the most convincing to establish mutagenicity as the MOA (U.S. EPA, 2007). For mutagenic MOA to be operational, evidence of mutation as the first key event that initiates a cascade of other key events of carcinogenesis is needed (U.S. EPA, 2007). The precursor effects associated with a mutagenic MOA will be indications of reactions with DNA, DNA repair, and fixation of mutations; hence, strength and consistency in evidence for mutagenicity is useful to establish the weight of evidence for mutagenic MOA (U.S. EPA, 2007). Limited data exist for Cr(VI) mutagenicity with only a handful of studies reporting Cr(VI)-induced mutations *in vivo*. Two studies have observed gene mutations following i.p. injection of high doses of Cr (VI) (Itoh and Shimada, 1998; Knudsen, 1980); discussed previously, these exposure routes are not physiologically-relevant.

Recently, O'Brien et al. (2013) evaluated K-*Ras* codon 12 GAT mutations in the duodenum of $B6C3F_1$ mice exposed to 0.1–180 mg/L Cr(VI) in drinking water for 90 days. K-*Ras*-mediated signaling plays a key role in controlling cell cycle progression as well as proliferation, differentiation, and apoptosis; further, this gene is relevant to both intestinal and lung cancers (Castellano and Santos, 2011; Fernandez-Medarde and Santos, 2011; Velho and Haigis, 2011). No treatment-related trend in K-*Ras* codon 12 GAT mutation was observed within the mouse duodenum (O'Brien et al., 2013). It is notable that Cr(VI) induced proliferative response in the duodenal crypts within 7 days of exposure to 180 mg/L Cr (VI), which was carcinogenic in the 2-year bioassay (NTP, 2008b), yet no increase in mutations was observed following 90 days of exposure. The lack of a concentration-dependent increase in K-*Ras* codon 12 GAT mutations in proliferating tissues at carcinogenic doses suggests that mutation is not likely an early key event of Cr(VI)-induced carcinogenesis.

To date, Cheng et al. (2000) is the only study to examine mutations in lung tissue. Therein Big Blue mice were exposed to Cr (VI) by intratracheal administration. Instillation of a single dose of 6.75, 9 and 22.5 mg/kg potassium chromate was lethal in 0/3, 1/3 and 3/3 mice, respectively; therefore, 6.75 mg/kg potassium chromate (equivalent to ~2.4 mg/kg Cr(VI)) was selected as the study dose to assess mutation (Cheng et al., 2000). Although not lethal, 6.75 mg/kg was likely toxic, as 9 mg/kg resulted in 33% lethality, approaching an LD_{50}. In addition, the concentration of Cr(VI) administered was extremely high. Based on the instillation volume of 25 μL, Cheng et al. instilled Cr(VI) at a concentration of 2400 mg/L (2.4 mg/kg × 0.025 kg/0.000025 L). This concentration was approximately equivalent to ~46 mM, which is several orders of magnitude greater than concentrations causing cytotoxicity to lung cells *in vitro* (Thompson et al., 2013). Intratracheal administration of 6.75 mg/kg increased the mutation frequency (MF) in lung by ~4-fold. Cheng et al. also reported increases in lung MF at lower concentrations (~3.3 mg/kg; ~23 mM), but still several orders of magnitude greater than cytotoxic concentrations *in vitro*. It is notable that the MF in treated animals 4 weeks after exposure were compared to the MF in controls at only 1 week post exposure; the lack of time-matched controls assumes that the background MF would be unaltered by the intratracheal surgery. The lower instillation dose of 3.3 mg/kg in Cheng et al., if applied to a human, would require 231 mg Cr (3.3 mg/kg × 70 kg), which is higher than the estimated extracellular reduction capacity of the human lung (137 ± 12 mg) (Table 8 in Haney et al., 2012). Even considering variability between species and individuals, the applied dose in Cheng et al. (2000) is expected to overwhelm lung reduction capacity.

Interestingly, Cheng et al. reported that sequencing of mutants from chromium-treated mice revealed a large increase in GC to TA transversions. Such transversions are commonly induced by reactive oxygen and nitrosative species (Klaunig and Kamendulis, 2008; Klaunig et al., 2010; Marnett, 2000) – suggesting that the increased MF was a result of oxidative and inflammatory processes induced by tissue damage expected from such high concentrations of Cr(VI). Given the high concentrations of Cr(VI) utilized in Cheng et al. (2000), it is difficult to conclude that any observed mutations in lung tissue were the result of a direct DNA-reactivity. Two independent recent reviews on chromium concluded that it was unclear if the mutations observed by Cheng et al. were due to Cr(VI) directly or secondary to Cr(VI)-induced inflammation from surgery and high doses of Cr(VI) (Thompson et al., 2013; Wise and Wise, 2012).

4.4. *Genomic instability* in vivo

Genomic instability is characterized by chromosomal instability (CIN) and/or MSI. The latter can be observed in tumor cells where there is either shortening or lengthening of repetitive DNA sequences that are prone to replication error (Geigl et al., 2008; Grady and Carethers, 2008). MSI is often a result of the loss or hindrance of DNA mismatch repair (MMR) genes such as MutL homolog 1 (MLH1). Indeed, some tumors exhibit hypermethylation of MLH1, and thus epigenetic silencing of MLH1 can result in an MSI phenotype without mutation in MMR genes (Geigl et al., 2008; Grady and Carethers, 2008). Increased genomic instability has been reported in the tumors of Cr(VI)-exposed workers. Analysis of lung tumor biopsies, from 35 workers occupationally exposed to chromate, exhibited fewer p53 point mutations (20%) than in lung tumors from 26 non-chromate exposed individuals (~50%); however, 79% of the tumors examined had signs of MSI as compared to 15% (4/26) in tumors from unexposed individuals (Hirose et al., 2002; Kondo et al., 1997). In addition, when comparing to lung tumors from non-exposed individuals, tumors from chromate workers also exhibited reduced expression of MLH1 as well as signs of MLH1 hypermethylation (Takahashi et al., 2005).

5. Chronic rodent bioassays

There are only two repeated dose studies evaluating Cr(VI) carcinogenicity in the rodent lung. In Steinhoff et al. (1986), sodium dichromate ($Na_2Cr_2O_7$) or calcium chromate ($CaCrO_4$) were administered to rats by intratracheal instillations for up to 30 months at dose rates of once per week or daily to achieve weekly doses of 0.05, 0.25, or 1.25 mg/kg. A dose-rate effect was observed for both $Na_2Cr_2O_7$ and $CaCrO_4$ at 1.25 mg/kg per week—large doses administered once per week were more potent than lower doses administered daily; however, both the high weekly dose and the lower daily dose were equal to same weekly dose. The rats that received ≤0.25 mg/kg of $Na_2Cr_2O_7$ five-times per week did not exhibit an increase in lung tumors, whereas 17.5% of the animals that received a single 1.25 mg/kg exhibited tumors in the lung (Fig. 2A). Tumor formation was accompanied by irritation and chronic inflammation that included the presence of alveolar macrophages, proliferation of bronchiolar epithelium, and chronic inflammatory thickening of alveolar septa. These lesions were much milder in rats exposed to the same weekly dose by daily administration. Steinhoff et al. concluded that concentration and irritancy/inflammation were more important in tumor formation than overall cumulative weekly dose. Calcium chromate, which has a longer half-life in the lung, was more potent than $Na_2Cr_2O_7$.

Glaser et al. (1986) conducted an 18-month inhalation study (22 h/day, 7 days per week) with Cr(VI) administered as submicron aerosols of $Na_2Cr_2O_7$ at 0, 25, 50 and 100 μg/m^3, and as a mixture of sodium dichromate and pyrolyzed chromium(III) oxide mixture of 3Cr(VI):2Cr(III) (Cr_5O_{12}) at 100 μg/m^3 (which was 63 μgCr(VI)/m^3). Lung tumors were only observed in 3/19 (16%) rats exposed to the highest dose of $Na_2Cr_2O_7$ administered (100 μg/m^3) (Fig. 2B). Glaser et al. characterized these findings as indicating weak carcinogenicity of Cr(VI). At study termination (12 months after the last exposure), Glaser et al. (1986) reported similar lesions as Steinhoff et al. in the rats exposed to Cr_5O_{12}, *viz.* accumulation of macrophages in lungs, eosinophilic substances inside the alveolar lumens, focal thickened septa, and fibrosis. In a subsequent study to evaluate the MOA for lung cancer, Glaser et al. (1990) exposed male Wister rats to 50, 100, 200, and 400 μg/m^3 $Na_2Cr_2O_7$ for 30 and 60 days, and 60 days with a 30-day recovery period. The study authors observed pulmonary irritation and inflammation, including increased protein, lactate dehydrogenase and macrophages in bronchioalveolar lavage (BAL) fluid as well as the occurrence of hyperplasia and fibrosis following subchronic exposure (Glaser et al., 1990). Although total protein and albumin in BAL fluid at the top two doses (200 and 400 μg/m^3) were still elevated following the 30-recovery period, macrophage count and lactate dehydrogenase returned to control levels, and fibrosis and hyperplasia were not observed following the 30-day recovery period. Fibrosis and hyperplasia were not observed in the chronic bioassay (Glaser et al., 1986), and Glaser et al. (1990) reported that the fibrosis and hyperplasia observed with subchronic exposures were not preneoplastic. Consistent with Steinhoff et al. (1986), Glaser et al. (1990) concluded that inflammation was essential for the induction of most Cr(VI)-induced pulmonary effects and that oxidative stress influenced the carcinogenicity of Cr(VI).

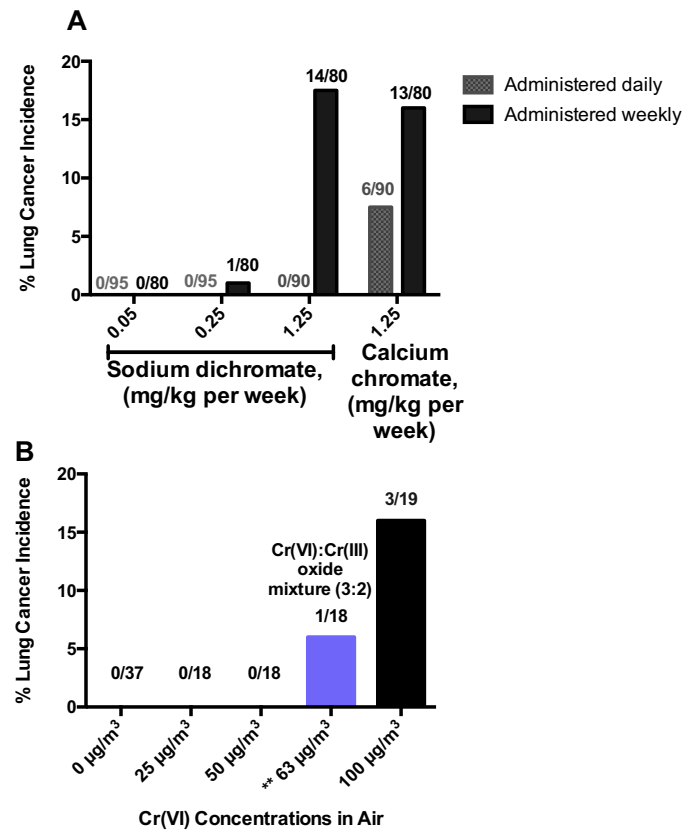

Fig. 2. Cr(VI)-induced lung cancers in (A) Steinhoff et al. (1986) and (B) Glaser et al. (1986). **Cr(VI):Cr(III) oxide mixture (3:2) at nominal Cr concentration of 100 μg/m^3 is equivalent to measured Cr(VI) concentration of 63 μg/m^3.

Taken together, the animal lung cancer data suggest that Cr(VI) is a weak carcinogen. There is evidence of a dose-rate effect, such that low concentrations are more readily detoxified than high exposures, and, that tumor formation occurs only in the presence of tissue irritation and inflammation.

6. Occupational exposures to Cr(VI) and lung cancer

Increased lung cancer risk among chromate production industry workers has been recognized in Europe and the US for many decades, with virtually every study of this industry reporting an excess risk (ATSDR, 2012). Nasal cancer has also been observed among workers with high Cr(VI) exposures including those in chromate and pigment production, chromium plating, and ferrochromium production (ATSDR, 2012; IARC, 1990; OSHA, 2006). In many of these industries, historical exposures have also been sufficient to induce severe respiratory tissue damage, including perforated nasal septum (Gibb et al., 2000a; Langard et al., 1980; Miller 1953; NIOSH, 1975). However, despite large occupational studies in other industries with significant Cr(VI) exposure, such as stainless steel welding and aerospace workers (Boice et al., 1999; Moulin, 1997), dose-dependent association between Cr(VI) exposure and increased lung cancer risk has not been observed.

Increased lung cancer risk is more pronounced among industries with exposure to sparingly soluble Cr(VI), such as exposure to calcium chromate in the "high lime" chromate production process, and zinc, lead and strontium chromate in pigment production (IARC, 1990). Several studies have evaluated the effect on lung cancer risk among workers exposed before and after the use of lime was significantly reduced, or eliminated, from the chromate production process in the 1960s (Davies et al., 1991; Korallus et al., 1993; Luippold et al., 2003, 2005). This process change, as well as reduced overall exposure, was shown to significantly decrease lung cancer risk (Birk et al., 2006; Davies et al., 1991; Korallus et al., 1993; Luippold et al., 2003, 2005). Thus, it is postulated that exposure to sparingly soluble Cr(VI) likely leads to greater Cr(VI) accumulation in the lung and a greater target tissue dose. However, it cannot be said that increased lung cancer risk among Cr(VI)-exposed workers is exclusive to industries with exposure to sparingly soluble Cr(VI) because observations of an increase risk have also been reported among workers in chromium plating where soluble chromic acid accounts for the chromium exposure burden (IARC, 1990; NIOSH, 1975; OSHA, 2006). One factor, which is consistently observed in industries for which there is an increased risk of lung cancer, is that exposures to Cr(VI) are sufficient to cause respiratory tissue damage, suggesting that irritation, proliferative repair and inflammation may play a role in carcinogenicity.

Data from the chromate production industry, specifically those of the Baltimore Maryland and Painesville Ohio cohorts, have been the basis of quantitative risk assessments for Cr(VI)-induced lung cancer (Haney et al., 2014; OSHA, 2006; Seidler et al., 2013; U.S. EPA, 1984), and are discussed herein. These data have led many investigators to consider a non-linear exposure–response (Birk et al., 2006; Haney et al., 2012; Park and Stayner, 2006; Proctor et al., 2004). However, quantitative risk assessments of Cr(VI) derived from these occupational data have primarily employed a default linear approach, with one notable exception being the recent assessment by Haney et al. (2012).

6.1. Lung cancer among chromate production workers

Over the last 50 years, many studies of chromate production workers (ATSDR, 2012; U.S. EPA, 1998) provide relatively robust data to assess the carcinogenicity of Cr(VI). At higher levels of exposure sufficient to induce respiratory tissue damage—at least as high as 25 $\mu g/m^3$—increase lung cancer risk has been reported in several key studies (Gibb et al., 2000a,b; Luippold et al., 2003).

Gibb et al. (2000b) reported increased lung cancer risk among 2357 chromate production workers employed from 1950 to 1974 in the Baltimore production plant. The observed/expected (O/E) ratio of lung cancer among the entire cohort was 1.80 (95% CI: 1.49–2.14); increasing O/E ratios by quartile of cumulative exposure were observed as well as notable difference in O/E ratio by race (Gibb et al., 2000b). The Baltimore cohort consists of a large fraction of short-term workers with 42% of the cohort having worked in the plant for less than 3 months, and the 50th percentile of exposure duration was only 4.7 months. However, even with mostly short-term exposures, airborne concentrations were sufficient to induce tissue damage, and nasal irritation and ulceration were observed in more than 60% of the cohort. Median exposure to Cr(VI) at the time of symptomatic occurrence, such as nasal septum perforation and bleeding, irritated or ulcerated skin, and nasal irritation and ulceration, was approximately 25 μg Cr(VI)/m^3 (Gibb et al., 2000a). Interestingly Gibb et al. (2011), an expanded analysis of the Baltimore cohort, reported a significant dose-rate effect wherein high cumulative exposure over a short period of time was associated with significantly greater risk of lung cancer mortality than the same cumulative exposure spread over a longer duration. This observation is consistent with that observed in animals of the Steinhoff et al. (1986) study.

Luippold et al. (2003) assessed mortality through 1997 for 493 formers workers employed from 1940–1972 in Painesville chromate production plant. The Painesville cohort included workers with at least 12 months of tenure, and workers experienced considerably higher levels of airborne Cr(VI) (Proctor et al., 2003). With a median tenure of 6 years, this cohort also had higher cumulative exposures than that of the Baltimore cohort. Lung cancer occurrence among an earlier cohort, *i.e.*, starting work in the 1930s, had been reported elsewhere (Mancuso, 1975), and the Mancuso study is the basis for the current EPA quantitative risk assessment for Cr(VI) (U.S. EPA, 1998).

The standardized mortality ratios (SMRs) for lung cancer for the cohort was 241 (95% CI: 180–319) (Luippold et al., 2003). The highest SMRs were observed for workers who started in the 1940s, had 20–32 years of exposure, 20–29 years since first exposure, and had cumulative exposure $\geq$2.7 mg/m^3 year. For the entire cohort, the average cumulative exposure was 1.58 mg/m^3 year (range: 0.003–23 mg/m^3 year), and 3.28 mg/m^3 year among those who died of lung cancer (Luippold et al., 2003). Of the 482 workers included in the mortality study, 60% had an estimated exposure $\leq$1.0 mg/m^3 year, and among those exposed at these levels, no significant increase in lung cancer risk was observed. At higher exposures, the SMRs for lung cancer were 365 (1.05–2.69 mg/m^3 year) and 463 (2.70–23 mg/m^3 year) (Luippold et al., 2003). The average Cr(VI) air concentrations measured in the Painesville plant during 1940–1949 was 720 $\mu g/m^3$, which decreased to 270 $\mu g/m^3$ between 1950 and 1964, and to 39 $\mu g/m^3$ by 1965 (Proctor et al., 2003). The reduction in lung cancer mortality over the years observed in the Painesville cohort (Luippold et al., 2003) tracked with the reduced airborne concentrations of Cr(VI) to which the workers were exposed, and no increase in lung cancer risk was observed for workers with highest monthly average exposures of 27 $\mu g/m^3$ (Proctor et al., 2004).

Miller (1953) studied Painesville workers from the 1940s and reported that 92 of 100 workers examined had nasal septum ulceration, and 65% had nasal septum perforation. Further, 98% and 93%, respectively, had engorgement and hypertrophy of the nasal turbinates. As noted earlier, Cr(VI) air concentrations in the Painesville plant studied in the 1940s were very high with an average concentration of 720 $\mu g/m^3$ (Proctor et al., 2003).

Table 3
Review of epidemiology literature for Cr(VI)-induced lung cancer in occupational settings.

Industry	Clear evidence of Cr(VI)-induced lung cancer	Consistent observations respiratory tissue damage	Evidence for a no effect level	Airborne exposure with no risk	Exposure to sparingly soluble Cr(VI)	Primary references
Chromate production	Yes	Yes	Yes	52 μg/m^3 1 mg/m^3 year	Yes	1, 2
Electroplating	Yes	Yes	Yes	Not quantified	No	1, 3
Pigment production	Yes	Yes, but limited data	Limited data—studies with measured exposure–response are based on high exposures	Not quantified	Yes	1, 4
Aerospace	No	No	Yes	15 μg/m^3	Yes	5
Welding (stainless steel)	No	Yes, but not consistently reported	Yes	120 μg/m^3 1.5 mg/m^3 year	Minimal	1, 6
Ferrochromium production	Yes	Yes	Yes	Not quantified	Minimal	1, 7

References: 1: IARC (1990); 2: Gibb et al. (2000a,b),Luippold et al. (2003), Proctor et al. (2004), Birk et al. (2006); 3: Sorahan et al. (1987); 4: Langard and Norseth (1975), Langard and Vigander (1983); 5: Boice et al. (1999), Marano et al. (2000), Alexander et al. (1996); 6: Gerin et al. (1993), Moulin (1997); 7: Langard et al. (1980), Axelsson et al. (1980).

Additionally, Birk et al. (2006) reported on lung cancer mortality of 901 workers in two chromate production facilities in Germany after the facilities changed to a no lime production process. Except for lung cancer, mortality from other causes was not significantly elevated. Consistent trends in lung cancer mortality were not observed with duration of exposure or time since first exposure. Lung cancer was increased among the highest exposure group, and these authors reported a possible threshold effect based on 2-fold increase in lung cancer mortality for workers with a cumulative concentration ≥200 μg/L year in urine.

Evidence for Cr(VI)-induced lung cancer and associated health effects among workers of the chromate production industry, and other industries with significant Cr(VI) exposure are summarized in Table 3.

6.2. Lung cancer among pigment production workers

Chromium compounds are used in the production of pigments to produce a wide range of vivid colors (OSHA, 2006). Forms of Cr (VI) to which pigment production workers are exposed include calcium, lead, zinc, barium and strontium chromate which are slightly soluble to insoluble. Studies of chromate pigment production workers have reported an increased risk of lung cancer and respiratory tissue damage association with high exposure concentrations (ATSDR, 2012). However, no detailed information has been provided to assess exposure–response; only a few studies provide exposure levels in this industry, and those levels were highly elevated as compared to the current OSHA permissible exposure limit (PEL) of 5 μg/m^3 (OSHA, 2006). Hayes et al. (1989) evaluated 1879 workers employed between 1940 and 1969 in a New Jersey lead and zinc chromate pigment production plant. Workers in the high-exposure group were exposed to greater than 2000 μg/m^3 chromate dust, whereas those in the moderate-exposure group were occasionally exposed to concentrations between 500 and 2000 μg/m^3 (Hayes et al., 1989). Although the lung cancer risk was not elevated for the overall cohort, there was a significant trend for increased lung cancer with exposure duration (Hayes et al., 1989). Two Norwegian studies (Langard and Norseth, 1975; Langard and Vigander, 1983) reported elevated lung cancer risk in workers at three pigment plants, which were in operation from 1948 to 1972. The chromium levels for the two older chromate pigment plants in year 1972 ranged from 40 to 1350 μg/m^3, and the levels in the new plant ranged from 10 to 80 μg/m^3 (Langard and Norseth, 1975; Langard and Vigander, 1983). Perforation of the nasal septum was also reported in chromate pigment production workers with lung cancer (Langard and Vigander, 1983).

6.3. Lung cancer among chrome plating workers

Among workers in chrome electroplating, positive exposure–response for lung cancer has also been observed (OSHA, 2006). Sorahan et al. (1987) evaluated mortality among 2689 nickel and chromium platers in England employed from 1946 to 1983. Workers in these plants were exposed to soluble Cr(VI) as chromic acid (CrO_3) mist, and their exposure was estimated based on chrome plating job categories and on cumulative duration of employment in chrome bath jobs. Compared to the general population of England and Wales, the workers had significantly elevated risk of lung and bronchial cancers (Sorahan et al., 1987). Other studies of chrome plating industry were inconclusive for exposure–response, and many studies did not have well-defined exposure data or had a short follow-up period or low statistical power (U.S. EPA, 1998). Respiratory tissue damage, ulceration and perforation of the nasal septum have been also reported among chrome platers (NIOSH, 1975). Highly acidic CrO_3 is a potent irritant; CrO_3 causes nasal irritation at exposures as low as 2 μg/m^3 (Lindberg and Hedenstierna, 1983).

6.4. Lung cancer among ferrochromium production workers

Elevated lung cancer risk has been reported among ferrochromium production workers although the evidence is somewhat limited (IARC, 1990; OSHA, 2006). In Langard et al. (1980), 976 workers employed at a plant that manufactured ferrosilicon and ferrochromium in Norway for more than one year from 1928 to 1977 were evaluated. Nine incident cases of lung cancer were observed in the study population, and 7 were among ferrochomium arc-furnace workers. The observed number of lung cancer cases were elevated compared to the expected number of lung cancer cases (national = 3.1 and local = 1.8) (Langard et al., 1980). However, no airborne Cr(VI) concentrations were measured in this plant. Consistent with Langard et al. (1980), a Swedish occupational study at a ferrochromium plant did not observe elevated rate of respiratory tumors (Axelsson et al., 1980). No increase in tumors was observed among heavily exposed workers at the arc-furnaces although cases of nasal irritation and perforation were reported (Axelsson et al., 1980).

6.5. Lung cancer among aerospace workers and stainless steel welders

It is of interest to further understand the differences in Cr(VI) exposures that occur among workers of other industries for which there is no increase in lung cancer. Significant Cr(VI) exposures occur in stainless steel welding and in the aerospace industry, but

several large epidemiological studies of workers have not demonstrated an increased risk of lung cancer in association with Cr(VI) exposure (Alexander et al., 1996; Boice et al., 1999; Gerin et al., 1993; Moulin, 1997).

Gerin et al. (1993) studied lung cancer mortality from Cr(VI) exposures among 11,092 stainless steel welders. Although a significant risk of lung cancer mortality was found, a positive exposure–response with quantitative measures of cumulative Cr (VI) exposure was not observed. In the highest cumulative exposure category (>1.5 mg/m^3 year), welders were not at an increased risk of lung cancer, but at this exposure in chromate production worker studies (Gibb et al., 2000b; Luippold et al., 2003) a significant increased lung cancer risk was reported. In a meta-analysis based on 18 case-control and 31 cohort studies conducted by Moulin (1997), the relative risk of lung cancer (RR) for mild-steel welders, with minimal to no Cr(VI) exposure, was the same as that for stainless steel welders with much higher Cr(VI) exposures. The author concluded that a 30–40% increase in the RR of lung cancer experienced by welders cannot be explained by exposure to Cr(VI) or to nickel in these stainless steel cohorts (Moulin 1997).

Limited information is available regarding Cr(VI) exposure concentrations among cohorts of stainless steel welders; however, the data that do exist suggest relatively high levels of exposure. Based on a national survey of air pollution in stainless steel welders conducted ten years prior to the actual study, Sjogren et al. estimated time-weighted average (TWA) Cr(VI) levels of 57 μg/m^3 for welding involving coated electrodes, and 5 μg/m^3 for gas-shielded welding (Sjogren et al., 1987). Peak levels were estimated to be 390 μg Cr(VI)/m^3 for welding involving coated electrodes, and 229 μg Cr(VI)/m^3 for gas-shielded welding (Sjogren et al., 1987). In comparison, the TWA exposures for the Gerin et al. cohort were estimated to range from 5 to 120 μg/m^3 for stainless steel welders. IARC (1990) provided a summary of Cr(VI) exposures among stainless steel welders and the concentrations ranged from 1 to 1500 μg/m^3. Cases of perforated nasal septum among welders are less common compared to chromate production workers, possibly due to differences in exposure concentration or particle size. Nonetheless, a few cases have been reported. For example, 11 cases of perforated nasal septum due to Cr(VI) exposure among 2869 welders in Korea was reported (Lee et al., 2002).

There have also been two large epidemiologic studies of aerospace workers exposed to Cr(VI) for which exposure–response was assessed (Alexander et al., 1996; Boice et al., 1999). Based on these studies, as well as others that assessed mortality but did not characterize exposure (Blair et al., 1998; Garabrant et al., 1988; Morgan et al., 1998), there is insufficient evidence in the published literature to conclude that aerospace workers carry an increased risk of lung cancer from Cr(VI) exposure. The Boice et al. (1999) study of aerospace workers in Los Angeles included 3634 Cr(VI)-exposed workers among which 87 had lung cancer. Boice et al. (1999) includes more Cr(VI)-exposed workers than the chromate production studies (Gibb et al., 2000b; Luippold et al., 2003), but no increased lung cancer risk was reported. Exposures among the Cr(VI)-exposed workers in Boice et al. (1999) averaged 15 μg/m^3 (Marano et al., 2000) and were much lower than exposures to chromate production and pigment production workers.

Interestingly, there may be differences in the physiochemical characteristics of Cr(VI) used as pigments in the aerospace industry compared to Cr(VI) exposures in the chromate and pigment production industries that might account for the difference in lung cancer risk in the respective worker populations. Aerospace workers are exposed to zinc and strontium chromate, which are sparingly soluble forms of Cr(VI) used as primers, and also CrO_3 is used to plate and anodize metal (Boice et al., 1999). However, the particle size of Cr(VI) primers used by aerospace workers are large and considerably less than 10% of Cr(VI) in spray drift that may be deposited in the lungs (LaPuma et al., 2001, 2002; Sabty-Daily et al., 2005). Hence, the bioavailability of chromium compounds, including particle size and solubility, as well as exposure concentration, are thought to ultimately affect the potential toxicity of Cr(VI) (discussed further in Section 7).

6.6. Cancers outside the respiratory tract

Well over 100 epidemiological studies in Cr(VI)-exposed workers have been published; although most have focused on lung cancer, dozens have also reported on cancers outside the respiratory system. In the meta-analysis of Gatto et al. (2010), 32 eligible studies published between 1950 and 2009 were identified and measures of effects extracted for gastrointestinal cancers in association with Cr(VI) exposure. More highly exposed occupational subgroups (workers in welding, chrome plating, chromate production, or pigment production) were also analyzed. No statistically elevated meta-SMRs were reported except for esophageal cancer among U.S. cohorts (meta-SMR 1.49; 95% CI: 1.06–2.09) (Gatto et al., 2010). However, that finding was based on a subgroup analysis of 4 studies. A main limitation of this meta-analysis was noted by Gatto et al. as inability to control for potential confounding factors including smoking, alcohol consumption, dietary factors, and socioeconomic status because most primary studies used in the meta-analysis did not include measures of these factors. Similar to the findings of Gatto et al. (2010), agencies such as IARC, EPA, OSHA, and ATSDR have generally not determined that cancers outside the respiratory tract are significantly elevated *via* inhalation exposures to Cr(VI) (ATSDR, 2012; IARC, 1990; OSHA, 2006; U.S. EPA, 1998). It is probable that the systemic bioavailability of inhaled Cr(VI) is low because of the significant reducing capacity of the lung and blood (Fig. 1), limiting exposure to other organs and the potential for carcinogenicity.

7. Cr(VI) pulmonary deposition and bioavailability in the lung

Cr(VI)-induced pulmonary carcinogenesis generally involves localized regions of tissue that sustain high Cr(VI) exposure and chronic cellular toxicity due to the predominant deposition of Cr(VI) particles in the bronchial bifurcations (Ishikawa et al., 1994; Nickens et al., 2010). Animal research demonstrates that sparingly soluble forms of Cr(VI) are likely to have greater carcinogenic potential than soluble forms due to longer residence time in the lung (Levy et al., 1986; Steinhoff et al., 1986). This is consistent with the observation that Cr(VI) carcinogenicity is most pronounced in the chromate production and pigment production industries, where workers are exposed to sparingly soluble chromates, including calcium, zinc and strontium and lead chromates (IARC, 1990; OSHA, 2006; Proctor et al., 2003, 2004).

As discussed previously, aerospace workers were exposed to sparingly soluble chromium but findings of elevated risk of lung cancer have not been reported. LaPuma et al. (2001, 2002) quantified the Cr(VI) content and mass of dry paint particles generated during primer painting operations by aerospace workers. A solvent-based, aviation primer paint was sprayed using a high-volume, low-pressure spray gun, and seven-stage cascade impactors were used to collect and separate paint particles based on their aerodynamic diameter (LaPuma et al., 2001, 2002; Sabty-Daily et al., 2005). The particles were found to range from 0.7 to 34.1 μm. Particles less than 7 μm in size had disproportionately less Cr(VI) per mass of dry paint compared to larger particles. The chromium content per mass of dry paint decreased substantially with decreasing particle size. The smallest particles, which were about 0.7 μm in size, contained about 10% of the

chromium content per mass of dry paint as the larger particles. Due to their smaller size, the smallest particles also have less chromium content per mass of dry paint compared to the larger particles because mass varies with the cube of the radius, *i.e.*, if the radius is reduced to one-tenth, mass reduces to one-thousandth. These findings support that the bioavailability of Cr(VI) and delivered dose to the lung in aerospace industry exposures may be relatively low, compared to Cr(VI) exposures in other industries, which may account for lack of elevated cancer risk among aerospace workers.

Further, Sabty-Daily et al. (2005) evaluated the size distribution of paint spray aerosol particles containing Cr(VI) at an aerospace facility. The sampled paint products consisted of strontium chromate in an epoxy resin matrix. In paint aerosol, particles containing total chromium had a mass median aerodynamic diameter (MMAD) of 7.5 μm; for particles containing Cr(VI), MMAD was 8.5 μm. On average, 62% of the chromium and Cr(VI) mass of the paint aerosol was in particles >10 μm. In Sabty-Daly et al. (2005), the investigators reported that about 72% of the Cr(VI) mass inhaled by a painter as particles from paint aerosol would be deposited in the head airways region, and only about 1.4% of the Cr(VI) mass may potentially deposit in the tracheobronchial region. Only 2% of the Cr(VI) mass was potentially deposited in the alveolar region (Sabty-Daily et al., 2005).

Limited data are available on the particle size of airborne Cr(VI) in the historical chromate production industry. The data that do exist are from the Painesville cohort studied in Luippold et al. (2003), and the aerodynamic equivalent diameter (AED) of the dust in the plant was 1.7 μm (Proctor et al., 2003). Also, the U.S Public Health Service conducted an evaluation of worker health in the early 1950s in the chromate production industry (PHS, 1953). Similar to the particle size reported for the Painesville plant, PHS (1953) reported median particle sizes in the range of 1.0 μm, and particle sizes of the Cr(VI) exposures were likely in the range that deposit in the tracheobronchial and alveolar regions of the lung.

Historical chromate production workers were exposed to a wide range of Cr(VI) particles and aerosols of varying solubility (*e.g.*, calcium chromate, water-soluble chromates and dichromates, chromic acid) (Proctor et al., 2003, 2004). It is recognized that the toxicity of Cr(VI) compounds can vary by the solubility of the salt (ATSDR, 2012). Strontium chromate is sparingly soluble in water at 1200 mg/L at 25 °C. Barium chromate and lead chromate are even less soluble (barium, 4.4 mg/L; lead, 0.58 mg/L); and, by comparison, calcium chromate is orders of magnitude more soluble (163,000 mg/L) than the strontium salt. However, the forms of calcium chromate in the chromate production industry are not simple salts, but complex molecules of sparing solubility (Proctor et al., 2003). Thus, the calcium chromate compounds to which the workers of the historical chromate production industry were exposed from kiln dust and roast were likely far less soluble than commercial grade calcium chromate.

In rats, Levy et al. studied Cr(VI)-induced lung cancer using an intrabronchial pellet implantation system, whereby pellets loaded with 22 different forms of Cr(VI) and a positive control were surgically implanted into the bronchi left bronchus of 100 animals per substance and then observed for 2 years (Levy et al., 1986; Levy and Venitt 1986). Implanting a pellet creates a high level of the compound in a small, localized area, which is more likely to overwhelm the body's defense mechanisms and resulted in metaplasia, dysplasia and chronic inflammation at the site of implantation. Approximately, 43% and 62% of rats with exposures to two forms of strontium chromate had bronchial carcinomas (Levy et al., 1986; Levy and Venitt 1986). By comparison, sodium dichromate, a highly water-soluble compound, only caused a tumor in single animal (1/99) (Levy et al., 1986). These authors concluded that strontium chromates were the most carcinogenic forms of Cr(VI).

8. Hypothesized MOA for lung cancer from inhalation exposures to Cr(VI) and supporting information

8.1. Key events in hypothesized MOA for Cr(VI)-induced lung cancer

Animal, human and mechanistic data suggest that Cr(VI)-induced lung cancer could be the result of thresholded mechanisms, and exhibit some similarities (and some differences) with other tumor locations (*viz.* the small intestine). The MOA is hypothesized to involve deposition and accumulation of particulate chromium in the bifurcations of the lung (*Key Event 1*). At these locations, exceedance of clearance mechanisms and detoxification by reduction, results in dissolved Cr(VI) or chromate particles entering cells through transporters and phagocytosis, respectively (*Key Event 2*). Once inside the cell, reduction of dissolved Cr(VI) results in the generation of ROS as well as binary and ternary Cr ligands. Subsequent protein and DNA damage lead to tissue irritation, inflammation, and cytotoxicity (*Key Event 3*). These effects concomitant with increased cell proliferation result in a changes to DNA sequences or methylation status (*Key Event 4*) that can lead to tumorigenesis. The key events are summarized in Fig. 3, and support for each proposed key event is provided below.

Key Event 1 involves dosimetry within the conducting airways of the lung. Available human data indicate that Cr(VI) inhalation exposure results in chromium accumulation in the bifurcations of the lung. Tissue samples and biopsies of lungs from autopsies and lobectomies of former chromate workers displayed highest chromium concentrations at bifurcation ridge centers followed by ridge edges as compared to adjacent regions (Ishikawa et al., 1994). Notably, these samples were taken from 9 individuals 22 years after (on average) the cessation of exposure, and precancerous lesions in chromate workers were observed at the bronchial bifurcations (Ishikawa et al., 1994). Centralized

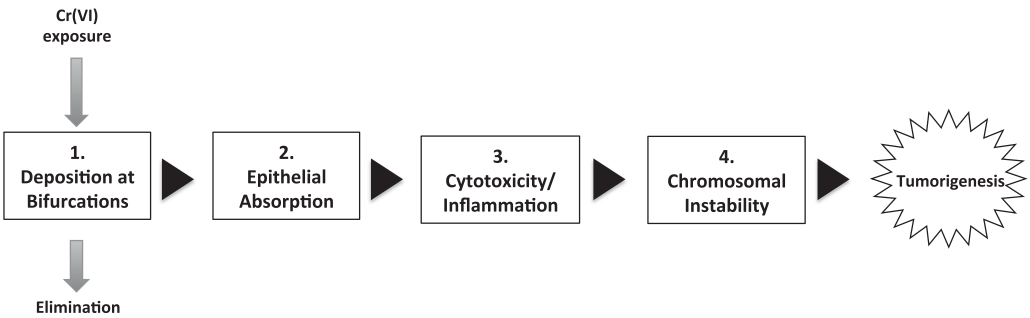

Fig. 3. Hypothesized MOA for Cr(VI)-induced lung cancer. The first two key events concern dosimetry. Herein, elimination process includes extracellular reduction of Cr(VI) to Cr(III) and particle clearance from the lung. Intracellular reduction of Cr(VI) leads to oxidative stress, DNA damage, inflammation, and cytotoxicity. Current data suggest involvement of chromosomal instability leads to tumorigenesis.

responses to Cr(VI) have also been observed following intratracheal exposures to chromium in animals (Beaver et al., 2009b; Steinhoff et al., 1986).

Key Event 2 involves uptake of chromium into epithelial cells near points of deposition. Chromate deposits result in transporter-mediated uptake of soluble Cr(VI) (Markovich 2001; Salnikow and Zhitkovich, 2008) and phagocytic uptake of particles into lung epithelial cells. Because Cr(VI) reduction and absorption are competing kinetic processes, small amounts of Cr(VI) may be absorbed even if doses are within the Cr(VI) reductive capacity of the lung; however, small doses that undergo intracellular reduction will likely be detoxified and insufficient to cause cellular damage. Larger doses and/or doses of sparingly soluble forms may accumulate in the lung increasing intracellular absorption and causing cellular damage.

The identification of so-called 'hot spots' (*i.e.*, bifurcations) for lung cancer can also be seen in Cr(VI)-induced intestinal cancer from drinking water exposures (NTP, 2008b). Within the alimentary canal of B6C3F1 mice, Cr levels were highest in the duodenum followed by the jejunum (Kirman et al., 2012; Thompson et al., 2011), and these are the regions where intestinal tumors developed (NTP, 2008). One likely explanation for this dosimetry pattern is that the duodenum and proximal jejunum are primary locations for dietary nutrient absorption (DeSesso and Jacobson, 2001). In fact, X-ray fluoresce microscopy reveals that duodenal Cr is localized to the intestinal villi where absorption from the intestinal lumen occurs (Thompson et al., (2014) Thompson et al., submitted). Importantly, Cr(VI) exposure did not induce cytotoxicity, proliferative responses or tumors in any other organs of mice (NTP, 2008b)—suggesting that Cr dosimetry in the portal of entry is a key component for intestinal carcinogenesis, and the same is likely true for the lung.

Once inside cells, soluble Cr(VI) is reduced by intracellular components such as GSH, ascorbate, other low molecular weight thiols, and proteins (De Flora 2000; Liu and Shi, 2001). Intracellular reduction of chromium can cause oxidative stress, protein damage, DNA damage, and other effects leading to tissue injury and inflammation *(Key Event 3*). Histological evidence for tissue injury and inflammation can be seen in both of the cancer bioassays for Cr(VI) (Glaser et al., 1986; Steinhoff et al., 1986) as well as the subchronic inhalation studies (Glaser et al., 1985, 1990). In Steinhoff et al. (1986), carcinogenic concentrations of Cr(VI) administered via intratracheal instillation (as soluble $Na_2Cr_2O_7$) were associated with damage and inflammation in rats. Severe damage to the bronchioloalveolar region included "alveolar atelectasis[1] and subsequent confluent fibrosis" (Steinhoff et al., 1986). Inflammatory responses, which were posited to give rise to the tumors, included cellular inflammatory focus involving alveolar macrophages, proliferation of bronchiolar epithelium or alveolar type II cells, and "chronic inflammatory thickening of alveolar septa" (Steinhoff et al., 1986). Steinhoff et al. concluded that "chromate carcinogenesis only occurs at highly toxic (irritant) levels, probably with the chronic irritant effect serving to promote the development of pulmonary tumours" (Steinhoff et al., 1986).

Thickened septa and fibrosis were also observed 12 months post treatment in the lungs of rats exposed to a slightly soluble Cr (VI):Cr(III) mixture of Cr_3O_{12} *via* inhalation (Glaser et al., 1986). In contrast, inhalation exposure to soluble sodium dichromate did not induce such lesions, nor inflammatory effects similar to those reported in Steinhoff et al. (1986). However, the absence of inflammatory lesions in Glaser et al. (1986) is likely explained by the fact that rats were examined 12 months after the termination of an 18-month exposure regimen. This extended observation period, provided a long recovery period allowing for clearance of soluble Cr(VI), and allowed for resolution of inflammation. Although the extended observation period limits information regarding key events preceding tumor formation from the Glaser et al. (1986) study, the apparent recovery supports that inflammatory responses and hyperplasia, observed in both the subchronic and chronic bioassays, are not due to mutation.

Inflammation has been suggested as a possible mechanism for lung tumor development in other short-term rodent studies. A 13-week inhalation study with 0.2, 0.5 and 1.25 mg/m^3 CrO_3 resulted in very little toxicity; however, inflammatory responses and macrophages were observed in the alveolar regions of rats exposed to 1.25 mg/m^3 (Kim et al., 2004). Mice exposed to 0.6 mg/mL zinc chromate either once or every 14 days over a 64-day period exhibited peribronchiolar, alveolar and interstitial inflammation, as well as elevated and aberrant cell proliferation in the airway lining (Beaver et al., 2009b). Beaver et al. concluded that Cr(VI)-induced lung inflammation likely contributes to the initiation and promotion of neoplasms of the lung.

The occupational epidemiologic studies support the role of irritation and inflammation in lung carcinogenicity as nasal septum perforation, irritation, and ulceration were commonly observed in studies of chromate production worker cohorts (Gibb et al., 2000a; Miller, 1953). The Cr(VI) air concentrations in the Painesville plant were historically very high, so as to result in frank effects of respiratory irritation and distress. At these exposure levels, highly increased risk for lung cancer mortality was observed (*i.e.*, SMR of 365 from Luippold et al. cohort exposed during the 1940s). It is reasonable to surmise that respiratory system tissue damage resulting from high Cr(VI) concentrations exposures may play a role in the MOA.

Molecular evidence of oxidative stress and cytotoxicity has been demonstrated in several intratracheal exposure studies. In Izzotti et al. (1998), apoptosis and oxidative DNA damage were observed with Cr(VI) administration, but all of these effects were mitigated in rats administered (p.o.) *N*-acetylcysteine, a reducing agent and precursor in GSH synthesis, prior to intratracheal administration of Cr(VI). Using a similar exposure model, intratracheal administration of 0.25 mg/kg $Na_2Cr_2O_7$ led to the induction of glutathione peroxidases, glutathione transferase subunits, and other transcripts indicative of responses to oxidative stress (Izzotti et al., 2002, 2004). There were also increases in apoptotic and proliferative genes, which were interpreted as indicating replacement of cells lost by apoptosis (Izzotti et al., 2002, 2004). Cr(VI)-induced apoptosis was also supported by nuclear p53 (Izzotti et al., 2004; posited by the study authors to be involved in apoptosis) and apoptotic index (D'Agostini et al., 2002). Cr(VI)-induced proliferation has also been demonstrated by the proliferative marker Ki67 in the lungs of BALBc/J mice exposed to zinc chromate by intratracheal administration (Beaver et al., 2009b). Intratracheal administration of high levels of CrO_3 (2.4 mg/kg) together with arsenic resulted in decreased lung GSH levels, increased GSSG levels, and increased expression of *Gclc* and *Gpx2* in C57BL/6J (Tajima et al., 2010). This co-exposure also resulted in elevations in markers of cytotoxicity (lactate dehydrogenase), apoptosis (caspases), inflammation (*Il6*), and proliferation (*Pcna*) (Tajima et al., 2010). Of the aforementioned markers, treatment with CrO_3 or arsenic alone had relatively little effect; however, CrO_3 alone did increase neutrophils in bronchial lavage fluid and *Pcna* labeling index in bronchiolar epithelial cells (Tajima et al., 2010). Although perhaps of limited relevance to the lung, robust mechanistic studies provide strong evidence for oxidative stress, cytotoxicity, and cell proliferation in the etiology of Cr(VI)-induced intestinal cancer (Thompson et al., 2013).

Several chromium researchers have stated (directly or indirectly) that Cr(VI)-induced carcinogenicity is unlikely to result solely

[1] Atelectasis is defined as collapse of a portion of the lung.

from mutagenicity. For example, Izzotti et al. (2004) state, . . . there is an evident discrepancy between the short-term induction of oxidative stress and genotoxic damage in lung cells . . . and the failure of chromium(VI) to induce lung tumors in the long-term . . . under the same experimental conditions. Holmes et al. (2008) state, the multistage carcinogenesis paradigm requires the stepwise acquisition of mutations in multiple key tumor suppressor and oncogenes . . . it appears that Cr(VI) is not a potent mutagen and is unlikely to induce sufficient mutations for this paradigm to apply. Therefore, we suggest that the multistage carcinogenesis does not fit well for chromate carcinogenesis. These conclusions are consistent with that of several expert members who characterized the mutagenicity of Cr(VI) as 'weak' at best (ERD, 2011). Most recently, Thompson et al. (2013) concluded that Cr(VI)-induced intestinal carcinogenesis is unlikely the result of a mutagenic MOA. Thus, despite evidence for Cr(VI)-induced oxidative and ternary ligand-based DNA damage, the MOA for Cr (VI)-induced lung cancer is unlikely to involve direct DNA mutation. In fact, there is evidence to support that *Key Event 4* in the MOA involves the induction of a chromosomal instability phenotype.

The strongest evidence for a chromosomal instability phenotype comes from human lung tumor specimens. In spontaneous human lung tumors, *KRAS* and *TP53* mutations are quite common (Hoenerhoff et al., 2009). In contrast, mutations in these genes are lower than expected in lung tumor samples from chromate workers. For example, no *KRAS* or *HRAS* mutations in critical 'hot-spot' codons were found in 38 lung tumors from 32 patients exposed to chromate (Ewis et al., 2001). Mutations in *TP53* were only detected in 4 of 20 tumors taken from 19 chromate workers, whereas approximately 10 would be expected (Kondo et al., 1997). Instead of specific gene mutations, 38 tumors taken from 28 chromate workers exhibited two or more markers of MSI (Hirose et al., 2002). In human colorectal cancer, chromosomal instability is observed in ~80–85% of cases, whereas MSI occurs in ~5% of cases (Geigl et al., 2008). In the cases where MSI is observed, there is usually a family history of cancers due to mutations in MMR genes such as *MSH2* and *MLH1* (Geigl et al., 2008). The observation that tumors from chromate workers display MSI led to the hypothesis that Cr(VI) might somehow target genes involved in MMR. Indeed, immunohistochemistry staining indicated reduced protein expression of MLH1 and MSH2 in tumors relative to adjacent tissues in samples form chromate workers (Takahashi et al., 2005). Further, DNA methylation was measured in 36 tumors form chromate workers and 25 non-chromate workers (Ali et al., 2011). Methylation in the promoter regions of *APC*, *MGMT*, and *MLH1* was detected in 44%, 20%, and 0% of tumors from unexposed workers, whereas methylation was detected in 86%, 20%, and 28% of chromate workers, respectively. The overall methylation index (genes methylated/genes examined) increased significantly ($p = 0.001$) from 0.21 to 0.41 in chromate workers. Data also suggested that *MLH1* methylation was significantly ($p = 0.038$) higher in early stage tumors. Despite the overall consistency of these studies, Ali et al. did not detect a direct correlation between *MLH1* methylation and *MLH1* protein expression ($p = 0.39$), although the authors speculated this may be due to the fact that their primers interrogated CpG regions upstream of a critical proximal CpG region (−248 to −178) shown to be involved in *MHL1* silencing (Ali et al., 2011).

In addition to the evidence from human tumor samples, experimental evidence supports involvement of MLH1 in Cr(VI) toxicity. Treatment of A549 cells with Cr(VI) was shown to increase methylation of histone H3 lysine 9 (H3K9) and repress *MLH1* expression (Sun et al., 2009). It has also been posited that Cr(VI) might "select" for cells deficient in MMR, which could increase genomic instability (Salnikow and Zhitkovich, 2008). This idea is based, in part, on evidence that cells deficient in MMR were resistant to Cr(VI)-induced toxicity (Peterson-Roth et al., 2005). It is conceivable, for instance, that DNA repair mechanisms can signal programmed cell death when damage is sufficiently high; thus, cells deficient in certain repair processes continue to survive, accumulate mutations (*e.g.*, chromosomal instability phenotype), and ultimately form clonal patches that lead to tumors. In fact, several researchers have proposed that Cr(VI) leads to chromosomal instability by selecting for, or generating cells with altered MMR processes (Holmes et al., 2008; Salnikow and Zhitkovich, 2008; Wise and Wise, 2012). To date, however, *in vivo* experimental evidence for Cr(VI)-induced genomic instability is lacking.

Based on the modified Hill criteria outlined in EPA's cancer risk assessment guideline (U.S. EPA, 2005), plausibility, dose–response, and temporal concordance for potential MOA were assessed and alternative MOAs and data gaps were identified. Detailed below are the analyses for Cr(VI)-induced lung cancer with the available kinetic, human, animal, and mechanistic data.

8.2. Dose–response and temporal concordance

An important aspect of MOA analysis is dose–response and temporal concordance. In accordance with the World Health Organization/International Programme on Chemical Safety (WHO/ICPS MOA) framework, dose–response and temporality of key events for a non-mutagenic MOA is presented in Table 4 using data from subchronic and chronic inhalation rodent studies (Glaser et al., 1985, 1986, 1990). There are only three studies in which animals were exposed to Cr(VI) *via* inhalation, and thus most relevant for evaluating the hypothesized MOA. Although exact mechanisms of Cr(VI) lung tumorigenesis cannot be established from this exercise, it is apparent that changes in alveolar macrophage and protein response in BAL fluids, indicative of pulmonary irritation, generally precede the development of bronchioalveolar hyperplasia and lung tumors in dose and time (Table 4). Importantly, two chronic Cr(VI) bioassays indicated that Cr(VI) causes lung tumors in rodents in a highly nonlinear fashion (Glaser et al., 1986; Steinhoff et al., 1986). Steinhoff et al. also showed that dose-rate was important: weekly exposure to 1.25 mg/m^3 was carcinogenic to 14/80 rats when administered in a single dose, but carcinogenic to 1/80 rats when administered as daily doses of 0.5 mg/m^3 (Fig. 2A). Lower doses (administered on a single day or spread across 5 days) were not carcinogenic. This finding is further supported by the observation of a significant dose-rate effect in the Baltimore cohort of chromate production workers (Gibb et al., 2011). Together, these findings are inconsistent with a linear MOA such as is hypothesized with a mutagenic MOA.

Unfortunately, thorough multi-dose mechanistic studies with inhaled (or intratracheal administration) Cr(VI) are not available; thus, it is difficult to demonstrate quantitative dose–response concordance of key events such as inflammation and cell proliferation. The studies by Beaver et al. (2009a,b), for example, employed a single concentration of Cr(VI). Studies similar to those that have been conducted to investigate the MOA for Cr(VI)-induced intestinal tumors would allow for establishment of dose–response concordance (Thompson et al., 2011, 2013). In this regard, it should be noted that there are a few transcriptomic and proteomic studies on the effects of Cr(VI) in the lung. However, these studies provided rather limited coverage (only a few hundred genes or less) as compared to more modern whole genome arrays; moreover, these studies often employed only a single concentration (D'Agostini et al., 2002; Izzotti et al., 2002, 2004).

Notwithstanding the lack of a comprehensive study designed to address the MOA of Cr(VI) in the lung, available data suggest temporal concordance. Kim et al. found only inflammatory

Table 4
Dose–response and temporality for key events of the hypothesized Cr(VI)-induced lung cancer MOA (adapted from Meek et al., 2014). The lowest dose for which a key event was observed at each time point based on subchronic and chronic inhalation studies of Cr(VI) given as $Na_2Cr_2O_7$ aerosols (22 or 23 h/day, 7 days/week). Glaser et al. (1985): exposures for 28 or 90 days; Glaser et al. (1986): exposures for 18 months; Glaser et al. (1990): exposures for 30 or 90 days. At 28 days, changes to alveolar macrophages and % of lymphocytes and granulocytes in BAL cells were only reported at exposures of 25 and 50 $\mu g/m^3$ (Glaser et al., 1985).

Temporal Association

Dose Response

Dose, µg/m3 Cr(VI)	Exposure Duration		
	30 days	90 days	18 months
0			
25		Increased diameter of macrophages in BALF (Glaser et al. 1985)	Accumulation of pigmented macrophages (Glaser et al. 1986)
50	Increased leukocytes in blood (Glaser et al. 1990) Increased total proteins, albumin, and LDH in BALF (Glaser et al. 1990) Bronchoalveolar hyperplasia (Glaser et al. 1990)	Increased leukocytes in blood (Glaser et al. 1990) Increased total proteins, albumin, and LDH in BALF (Glaser et al. 1990) Increased number of dividing macrophages (Glaser et al. 1990) Changes in the number of macrophages in BALF (Glaser et al. 1985, 1990)	
100		Bronchoalveolar hyperplasia (Glaser et al. 1985, 1990)	Lung tumors (Glaser et al. 1986)

responses in the high dose group of rats exposed to Cr(VI) via inhalation for 13 weeks (Kim et al., 2004). Beaver et al. showed that Cr(VI) induces persistent inflammatory responses as early as one day after single or repeated exposures to Cr(VI), and lung epithelial cell proliferation after at least five repeated exposures (Beaver et al., 2009a,b). It is well known that inflammation can induce oxidative stress and that chronic inflammation and cell proliferation both contribute to carcinogenesis.

8.3. Plausibility

In assessing plausibility, one must consider what is known about lung cancer and chemical- induced lung cancer in particular. Small cell cancer (~15%) and non-small cell cancer (85%) are two major forms of lung cancer; the latter form is comprised mainly of large cell cancer, adenocarcinomas, and squamous cell carcinomas (Herbst et al., 2008). Adenocarcinomas are most common among nonsmokers and tend to arise in the peripheral airways (Herbst et al., 2008). In contrast, smoking is most strongly linked to small cell cancer and squamous cell carcinomas that often develop in the central airways (Herbst et al., 2008). The vast majority of Cr(VI)-induced cancers were squamous cell carcinomas of the central airways (due to deposition at bifurcations) (Ishikawa et al., 1994; Hirose et al., 2002). The reported absence of KRAS mutations in chromate tumors (Ewis et al., 2001) described earlier is therefore not unexpected given that KRAS mutations in lung tumors are often found in adenocarcinomas and rarely in squamous cell carcinomas (Hecht, 1999; Herbst et al., 2008). Mutations in TP53 are present in ~50–70% of squamous cell carcinomas and adenocarcinomas, and ~75% of small cell cancers (Hecht, 1999; Herbst et al., 2008). Although the incidence of TP53 mutations in chromate tumors was only 20% (Kondo et al., 1997), the sample size may have been too small to draw any definitive conclusions. Kondo et al. found only 4/20 mutations when 10/20 would be expected, but it remains to be seen whether this value would regress to the mean or remain low with additional tumor samples. In the two Cr(VI) rodent cancer bioassays, adenomas were more prevalent than squamous cell carcinomas (Glaser et al., 1986; Steinhoff et al., 1986). Interestingly, the two positive controls in Steinhoff et al. (1986), dimethylcarbamyl chloride and benzo(a)pyrene, primarily induced squamous cell carcinomas. Thus, the Cr(VI)-induced tumors in rats might not be ideal models to study Cr(VI)-induced tumors in humans; nevertheless, the biochemistry of Cr(VI) and thus early keys events are likely to be similar.

The MSI findings by Hirose et al. (2002) were intriguing and perhaps sparked a line of research that later supported the notion that Cr(VI) worked (perhaps uniquely) by selecting for a chromosomal instability phenotype. Although Hirose et al. reported that 79% of the chromate tumors (30/38) and only 15% (4/26) of the non-chromate tumors had two or more markers of MSI, 92% (35/38) and 50% (13/26) exhibited at least one marker of MSI (Hirose et al., 2002). It should also be recognized beyond exposure differences, the tumors in chromate and non-chromate exposed individuals were at different disease stages: 71% (27/38) of the chromate-related lung tumors were stage I, whereas only 31% (8/26) of the non-chromate-related tumors were stage I. In addition, 10/27 stage I chromate-related tumors were characterized as "early", whereas none of the 10 non-chromate-related tumors were characterized as early. Ali et al. (2011) later reported that hypermethylation of *MLH1* was associated with early stage lung cancers. Notably, MSI and changes in promoter methylation can be seen in early stages of smoking-related lung cancer (Herbst et al., 2008). As such, it is uncertain

whether the studies on lung tumors from Japanese chromate workers reflect chemical specific effects of chromium, or rather differences in tumor stages.

Despite these uncertainties, as indicated in the previous discussion of the key events in the MOA, many scientists question the ability of Cr(VI) to cause tumors by a linear mutagenic MOA (Izzotti et al., 2004; Holmes et al., 2008; Wise and Wise, 2012; ERD, 2011; Thompson et al., 2013; Haney et al., 2012). As discussed in Sections 3 and 4, *in vitro* and *in vivo* data indicate that Cr(VI) is only weakly mutagenic and other mechanisms resulting in genomic instability, inflammation, cytotoxicity, and impaired repair mechanisms are likely important for the carcinogenic processes of Cr (VI). Additionally, there is evidence of a dose-rate effect (Gibb et al., 2011; Steinhoff et al., 1986), suggesting that low concentrations of Cr(VI) are more readily reduced to Cr(III) than at high exposures, and lung tumors observed in animals and humans occur with tissue irritation and inflammation.

Perhaps the best data for assessing the MOA are those recently developed for intestinal cancer in mice (Thompson et al., 2013). From that research, at carcinogenic doses that induced a proliferative response following 90-days of exposure, the target-tissue *Kras* mutant fraction were unchanged, and no inductions of micronuclei formation were observed after 90-days of exposure (O'Brien et al., 2013). Recent *in vitro* studies with Cr(VI) indicate that Cr(VI)-induced micronucleus formation and DNA double stand break formation are closely linked to cytotoxicity (Thompson et al., 2012). This supports that while Cr(VI) can damage DNA, it does not appear to do so at non-cytotoxic levels—a finding that is inconsistent with a mutagenic MOA and linear low dose extrapolation.

A recent review on mechanisms of arsenic-induced lung cancer provides some interesting parallels to Cr(VI) (Hubaux et al., 2013). In a manner analogous to Cr(VI), pentavalent arsenic [As(V)] enters cells where it is subsequently reduced to the trivalent form of As [As(III)] by thioredoxin and GSH (Rossman, 2003). Arsenic also undergoes a series of methylation and reduction reactions leading to several methylated species, some of which can interfere with the electron transport chain. Thus, intracellular reduction of arsenic can induce oxidative stress by altering cellular thiols and interfering with mitochondrial function (Hubaux et al., 2013). In addition, methylation of arsenic depletes the methyl donor *S*-adenosyl methionine and interferes with DNA methylation patterns (Hubaux et al., 2013). Arsenic can also lead to EGFR activation and increased cell proliferation (Hubaux et al., 2013), perhaps due to altered gene expression resulting from DNA methylation and redox changes. Hubaux et al. conclude that "genetic changes are acquired mainly through the induction of ROS during the biotransformation process, while the competition for methyl groups between As^V detoxification enzymes and DMT's contribute to epigenetic abnormalities". It should be noted that arsenic, unlike Cr(VI), can induce lung tumors from oral exposure in drinking water. Nevertheless, these two metals may share similar MOAs involving changes in redox and DNA methylation that can induce both genetic and epigenetic changes. As noted previously, co-administration of CrO_3 and arsenic resulted in synergistic effects on redox status, inflammation, apoptosis, and cell proliferation (Tajima et al., 2010).

8.4. Data gaps

Although there is empirical evidence that Cr(VI)-induced lung cancer is a high-dose effect, these studies have limitations in size, duration, and route of administration. More detailed inhalation toxicity studies examining biochemical, molecular, and histopathological responses to Cr(VI) could better inform the MOA. Intriguing recent evidence for Cr(VI)-induced lung cancers being the result of chromosomal instability are perhaps confounded by their comparison to later stage tumors as discussed above. Thus, more detailed analysis of chromate-related tumor samples and appropriately matched comparison groups could better inform the role that chromosomal instability plays in Cr(VI)-induced cancer. *In vivo* mutation data from the lungs of animals exposed to Cr(VI) are, to date, confounded by both route (intratracheal instillation) and high concentrations of Cr(VI) that likely resulted in frank tissue toxicity. Perhaps toxicogenomic and global DNA methylation analyses could also shed light on the MOA for Cr(VI)-induced lung cancer. Despite these data gaps, the hypothesized MOA depicted in Fig. 3 seems plausible in light of the growing recognition that Cr(VI) is at best a weak mutagen.

8.5. Alternative MOAs

Cr(VI) exposure is clearly associated with increased risk of lung cancer among workers in certain industries, but there is little evidence that Cr(VI) causes other cancers in humans or presents a risk at typical environmental exposure levels. Some researchers have concluded that all cancers observed following Cr(VI) exposure are the result of mutagenic MOAs without careful consideration of (a) tissue-specific characteristics, (b) *in vivo* evidence for a lack of genotoxicity, and (c) *in vivo* evidence of non-mutagenic factors such as chronic toxicity and epigenetic modifications (McCarroll et al., 2010; Zhitkovich, 2011). Notably, others have suggested that much of the *in vitro* evidence of Cr(VI) mutagenicity stems from assays using "experimentally contrived systems" (Wise and Wise, 2012), and a number of recent analyses demonstrated high false positive rates from *in vitro* genotoxicity tests (in particular, tests using mammalian cell lines) in comparison with rodent carcinogenicity results (Kirkland et al., 2007). It should be appreciated that even if the MOA for a chemical-induced tumor involves direct DNA interaction, practical thresholds may still exist. Indeed, an international group of experts are exploring methods for moving away from "positive/negative" or "yes/no" mutation results to dose–response methodologies for setting safe levels of exposures of genotoxic agents (Gollapudi et al., 2013; Johnson et al., 2014), and the EPA Cancer Guidelines acknowledges dose-dependent differences in the MOA (U.S. EPA, 2005).

As discussed in a recent article on the WHO/IPCS MOA framework, it is sometimes useful to comparatively assess the evidence for alternative MOA hypotheses (Meek et al., 2014). As noted previously, a mutagenic MOA, again defined here and elsewhere as involving mutation as an early and influential key event, for lung tumors is conceivable. Tables 5 and 6 compare the weight of evidence for mutagenic and non-mutagenic MOAs, respectively. It is our judgment that the evidence for a mutagenic MOA is weaker compared to that for a non-mutagenic MOA. However, we also acknowledge that there remain certain data gaps for a both a non-mutagenic (see Section 8.4) and mutagenic MOA. In this regard, we are currently conducting an OECD-guideline compliant transgenic mutation assay for oral exposure to Cr(VI) in rats. Although this study does not directly address the potential for mutations in the lung by inhalation, the study could potentially inform the likelihood for Cr(VI) to cause DNA mutations *in vivo*.

9. Mode of action implications for risk assessment and conclusions

The overall weight of evidence supports that Cr(VI) induces lung tumors through a MOA involving deposition and accumulation of particulate chromium in the lung leading to exceedance of clearance and extracellular reduction mechanisms and cytotoxicity and inflammation due to intracellular reduction of high tissue doses of absrobed Cr(VI). Hence, when extrapolating lung cancer

Table 5
Comparative weight of evidence for mutagenic MOA for Cr(VI) lung carcinogenesis in application of the WHO/IPCS framework (adapted from Meek et al., 2014).

Modified Bradford Hill consideration	Mutagenic MOA	
	Supporting evidence	Potentially inconsistent evidence
Dose–response and temporal concordance	Intratracheal instillation of 6.75 mg/kg resulted increased MFs in the lung of Big Blue mice (Cheng et al., 2000). DNA fragmentation, DNA–protein crosslinks, nucleotide modifications, and 8-OH-dG observed in lung of rats administered 0.25 mg/kg SDD intratracheally for 3 days (Izzotti et al., 1998).	The intratracheal instillation concentrations were in mM range, and thus likely toxic. Administration of 9 mg/kg resulted in death of 1 or 3 mice (Cheng et al., 2000). The mutation spectrum was supportive of a secondary oxidative DNA damage (Wise and Wise, 2012; Thompson et al., 2013). Effects in Izzotti et al. (1998) were mitigated in rats administered (p.o.) *N*-acetylcystein prior to intratracheal administration. Chronic administration of 0.25 mg/kg SDD was not carcinogenic to rats (Steinhoff et al., 1986).
Consistency, specificity	Positive findings from multiple *in vitro* genetic toxicology studies. DNA damage, gene mutations, and chromosome aberrations induced *in vivo* (McCarroll et al., 2010; Table 2). DNA damage and MN induction in the peripheral blood lymphocytes and buccal epithelial cells of Cr(VI)-exposed workers (Benova et al., 2002; Dana Devi et al., 2004; Gambelunghe et al., 2003; Vaglenov et al., 1999).	*In vitro* data suggest high dose, high toxicity or experimentally contrived systems such as the shuttle vector approach are needed. The concentration utilized *in* vitro were 20–200 μM range in short periods of time, which are not reevant for occupational or environmental exposures (Holmes et al., 2008; Nickens et al., 2010; Wise and Wise, 2012). Repeated administration of Cr(VI) produced negative, equivocal, and some positive results in *in vivo* blood MN assay (NTP, 2008). Repeated administration of Cr(VI) produced no MN in crypt epithelial cells or increases in Kras MF (O'Brien et al., 2013). Negative MN in buccal mucosa of Cr platers (Sarto et al., 1990). No increases in chromosomal aberration observed in Benova et al. (2002). Vaglenov et al. (1999) reported Cr(VI) concentrations that cause severe nasal irritation and tissue damage.
Biological plausibility	Cr(VI) is genotoxic *in vitro* and *in vivo*: liver, brain, bone marrow of rats and/or mice; DNA damage and MN induction in humans (McCarroll et al., 2010). Mutation is consistent with tumor biology.	*In vivo* studies reporting positive for DNA damage implicated oxidative stress, which suggests that mutation is secondary to other molecular events. Many Cr(VI) researchers believe Cr(VI) is too weak of a mutagen, and thus Cr-induced cancer requires irritation, inflammation, or genomic instability (Holmes et al., 2008; Nickens et al., 2010). Lung cancers in chromate production workers exhibit molecular features that are different from smoking, *i.e.*, microsatellite instability and methylation of tumor suppressor genes (Urbano et al., 2012).

Table 6
Comparative weight of evidence for nonmutagenic MOA for Cr(VI) lung carcinogenesis in application of the WHO/IPCS framework (adapted from Meek et al., 2014).

Modified Bradford Hill consideration	Nonmutagenic MOA	
	Supporting evidence	Potentially inconsistent evidence
Dose–response and temporal concordance	Extracellular reductive capacity in the lungs limits absorption (De Flora et al., 1997) and introduces non-linearity in the extrapolation of tissue dose from high to low dose. Lung tumor formation preceded by irritation and inflammation in both dose and time, and support a dose-rate effect in rodent bioassays (Glaser et al., 1986; Steinhoff et al., 1986). Tissue injury and a marked inflammatory response in the lung with particulate Cr exposures (Nickens et al., 2010). *In vivo* mechanisitic data indicate persistent inflammatory responses in the lung preceding epithelial cell proliferation.	Cr(VI) intratracheal instillation induced GC to TA transversions in Big Blue mouse lung tissues, however, tissue lesions were not assessed (Cheng et al., 2000). Comet assays detected single/double strand DNA breakes in leukocytes of mice, which commenced within 24 h of oral gavage dosing (0.18–24 mg/kg Cr(VI) (Dana Devi et al., 2001). Rats developed oral cavity tumors from high dose exposure to Cr(VI) in drinking water without apparent evidence of non-neoplastic lesions and tissue injury (NTP, 2008).
Consistency, specificity	Two chronic bioassays found similar non-neoplastic and neoplastic lesions in rodent lungs (Steinhoff et al., 1986; Glaser et al., 1986). Mechanistic data provide evidence of oxidative lesions, inflammation, and proliferation. In workers with elevated lung cancer, exposures also induced perforated nasal septum, irritation, and ulceration (Gibb et al., 2000a; Miller, 1953). Dose-rate effect also observed in chromate production workers (Gibb et al., 2011)	Cr(VI) is genotoxic in numerous *in vitro* assays, in some animal studies at high doses and by non-natural routes of administration, and in two cross-sectional studies of Cr(VI) exposed workers albeit not in target tissues with observed tumors.
Biological plausibility	Many chromium researches believe that the mutagenic capacity of Cr(VI) is not potent enough to induce sufficient levels of mutations to critical tumor suppressor genes and oncogenes (ERD, 2011; Holmes et al., 2008). Epigenetic mechanisms have been identified in studies of chromate exposed lung cancer patients (Kondo et al., 2006; Takahashi et al., 2005). Non-mutagenic MOA is likely involved in other Cr(VI)-induced tumors (Thompson et al., 2013). Nonmutagenic MOAs are consistent with tumor biology and observations in animal bioassays.	Additional research is needed to provide a more complete understanding on the mechanisms of Cr(VI)-induced carcinogenesis.

risk occurring from high concentration occupational exposures to current occupational and environmentally-relevant exposures, non-linear approaches should be considered. As demonstrated by *in vitro* and *in vivo* data, extracellular Cr(VI) reduction in the lung limits absorption and may introduce non-linearity in the extrapolation of tissue dose from high to low exposures (Proctor et al., 2004; Haney et al., 2012). In addition, both the animal and human data support that the forms of Cr(VI) with the longest residency time in the lung, *i.e.*, the sparingly soluble forms, pose the more significant cancer hazard. This information supports that tissue dose in the lung, which is the sum of inhaled and retained dose, less eliminated dose, is the dose metric most predictive of lung cancer risk. However, measures of Cr(VI) reduction rate and capacity in the lung are lacking, and exposure–response data for worker populations is mostly limited to measures of cumulative exposure.

Recently, three inhalation cancer risk assessments for Cr(VI) were published based on the available epidemiological data (Haney et al., 2012, 2014; Seidler et al., 2013). Also, relatively recently, OSHA and NIOSH both completed risk assessments in support of a revised permissible exposure limit (PEL) (OSHA, 2006; NIOSH, 2013). Seidler et al. (2013) systematically searched for studies reporting on occupational Cr(VI) exposure and cancers of the respiratory tract to evaluate exposure–risk relationship in order to establish tolerable and acceptable limits for occupational exposure in Germany, and Haney et al. (2012) conducted a similar analysis but also quantified carcinogenic thresholds to be used as points of departure (PODs) in risk assessment. In Haney et al. (2014), linear approaches were considered in developing an inhalation unit risk factor for Cr(VI). In these reviews, only the recent studies of the chromate production cohorts in the U.S. and Germany, as described previously, were found to be of acceptable methodological quality, and exposure–risk relationships were evaluated for these studies.

In Seidler et al. (2013), a linear model was applied to the data because direct genotoxicity was considered the predominant mechanisms of Cr(VI) carcinogenesis, and the exposure–response was modeled based on data for the Baltimore and Painesville cohorts. OSHA and NIOSH also focused its assessments on the Painesville and Baltimore cohorts; although consideration was given to non-linear models, both agencies concluded that non-linear models did not improve model fit and thus relied on the traditional linear relative risk model for these studies (OSHA, 2006; NIOSH, 2013).

In comparison, Haney et al. (2012) reviewed the same epidemiologic studies available in the scientific literature, as well as the Birk et al. (2006) study of German chromate production workers, to conduct exposure–response analyses investigating both linear and non-linear approaches for inhalation cancer risk assessment. Haney et al. (2012) concluded that a non-linear thresholded MOA was biologically plausible and that saturation of reducing capacity in the lung could provide a measurable threshold, which could be used as a point of comparison for cancer risk assessment. Assuming a thresholded exposure–response, these authors quantified the exposures at which no excess lung cancer risk was observed in the key epidemiologic and animal studies. The findings of our MOA review provide further support for a non-linear exposure–response of Haney et al. (2012).

MOA data are used to identify the existence of a threshold, but typically cannot be used to quantify it (Crump, 2011). In the case of Cr (VI)-induced lung tumors, the identification of a threshold dose, using statistical analysis of mortality data, is challenged by low statistical power in the low exposure range, the high background risk of lung cancer in the occupational cohorts of the higher quality studies, and high smoking prevalence among the cohorts which was reported to range from approximately 78 to 90% (Birk et al., 2006; Crump et al., 2003; Gibb et al., 2000b). Nonetheless, these data have been used for cancer risk assessment and refining the exposure–response in the low exposure range would contribute valuable information for assessing current occupational and environmental Cr(VI) exposures.

More than 10 years have passed since the Painesville cohort was last evaluated for Cr(VI)-related cancer mortality in Luippold et al. (2003). Recently, a comprehensive effort has been made to update the mortality of the Painesville cohort which will include short-term workers who were not evaluated previously; exposure–response modeling is also being conducted to develop new risk assessment approaches for airborne Cr(VI), and exposure metrics to be evaluated include highest exposure and cumulative exposure (manuscript in preparation). The current EPA Cr(VI) inhalation cancer slope factor was developed in 1984 based on the study of Mancuso (1975) of Painesville workers who started in the plant in the 1930s, but the agency is currently in the process of updating its assessment as OSHA did in 2006. Information from the updated mortality study and dose–response modeling from the Painesville cohort, in addition to this evaluation of the MOA for Cr(VI)-induced lung tumors, should provide useful current data for consideration in future regulatory risk assessment of Cr(VI).

Conflict of interest

DP, MS and CT are employed at ToxStrategies, which is a private consulting firm providing services to private and public organizations on toxicology and risk assessment issues. SC, formerly with the Electric Power Research Institute (EPRI), initiated the project and participated with the research team on a regular basis as her role as a co-author and toxicologist. An EPRI researcher (Dr. Annette Rohr) was given the opportunity to review the draft manuscript. The purpose of the review was to allow input on the clarity of the science presented but not in interpretation of the research findings. The contents of this review reflect solely the view of the authors. DP has also been an expert in litigation involving Cr(VI).

Transparency document

The Transparency document associated with this article can be found in the online version.

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