SUMMARY REPORT

FOR

FANSTEEL ASSESSMENT FILE REVIEW
10 TANTALUM PLACE
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Prepared for

U.S. Environmental Protection Agency, Region 6
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SUMMARY REPORT

1. SUMMARY OF ACTIONS

On 04 May 2020, Weston Solutions, Inc. (WESTON®), the Superfund Technical Assessment and Response Team (START) contractor, was tasked by the U.S. Environmental Protection Agency (EPA) Region 6, under Contract Number EP-S5-17-02 and Technical Direction Document (TDD) No. 0001/20-352, to provide general technical support and management activities for the Fansteel Assessment File Review (Site) located at 10 Tantalum Place in Muskogee, Muskogee County, Oklahoma.

In support of the EPA Task Monitor (TM), START completed a review of available National Regulatory Commission (NRC) reports, and historical information provided by EPA and Oklahoma Department of Environmental Quality (ODEQ), to gain a better understanding of Site conditions and historical work completed at the Site. START reviewed the available information regarding the construction of an existing water interceptor trench system and researched various alternatives to reduce groundwater entering the system and estimated operation and maintenance costs (Attachment A). Removal options, including estimated transportation and disposal costs (T&D) for low-level radiological material located at the soil stockpile area, and super sacs located in the sodium reduction building, were investigated (Attachment B). A soil stockpile streamlined risk characterization report was prepared to demonstrate how the radiological risk to an outdoor worker would be reduced by soil capping. Additionally, the installation of a high-density polyethylene (HDPE) liner for reducing radiological exposure risk associated with the soil stockpile was also investigated as a remedial alternative (Attachment C). A groundwater pathway risk evaluation was completed to determine whether site contaminants in groundwater pose a potential risk to human health if the current groundwater treatment system were to fail in the absence of any further remedial action, and if on-site groundwater to be used for drinking water or groundwater contamination migrated toward the Arkansas River to current drinking water intakes. Indoor air exposure to on-site workers through the vapor intrusion (VI) pathway was also evaluated based on the maximum detected groundwater concentrations (Attachment D). A potentiometric surface map and Site groundwater velocity calculations were also prepared as supplemental

information to the groundwater risk pathway report (Attachments E and F). Working files and estimated costs obtained from various vendors are included in Attachment G.

This summary report was prepared as part of the requirements of TDD No. 0001/20-352 and serves as documentation of work completed to date.

2. LIST OF ATTACHMENTS

Attachment A – Groundwater Interceptor Trench Options and Estimated Costs
Attachment B – Fansteel Removal Options and Estimated Costs
Attachment C – Fansteel Soil Stockpile Streamlined Risk Characterization Report
Attachment D – Fansteel Groundwater Risk Characterization Report
Attachment E – Groundwater Potentiometric Surface Contour Map
Attachment F – Calculation of Groundwater Flux to Arkansas River
Attachment G – Working Files and Cost Estimates

☐ The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

☐ The EPA Task Monitor has provided final approval of this report. Therefore, Weston Solutions, Inc. has submitted this report with the Task Monitor's approval.

ATTACHMENT A

GROUNDWATER INTERCEPTOR TRENCH OPTIONS AND ESTIMATED COSTS

Draft- For Discussion Purposes Only

Fansteel Assessment/File Review
(SSID: A6S4)
Options – Groundwater Interceptor Trench (GIT)

Option	Preliminary Conceptual Assumptions	Order of Magnitude Cost
#1: Convert Existing Groundwater Interceptor Trench (GIT) to Slurry Wall	• Approx. length = 3,000 feet • Replace gravel and fill in the existing trench with soil-bentonite slurry or concrete up to 2 feet of the surface. • Groundwater management may be needed because groundwater seems to be within a few feet of the surface near Cleanout #1 and Sump #1.	$850,000 [a]
#2: Convert Existing GIT to PRB	• Approx. length = 3,000 feet • Replace gravel in the existing trench with zero valent iron (ZVI). Fill out the remaining depth with soil. • General longevity of ZVI is > 15 years. However, this is site-specific (treatability study may be needed) • Performance monitoring will be needed.	$7M [b]
#3: Hybrid of Options #1 and #2	• Total 1approx. length = 3,000 feet; PRB length = 100 feet; Slurry Wall length = 2,900 feet • 100-foot PRB installed in the area between Cleanout #1 and Sump #1, where groundwater is very close to the surface. Replace gravel in the existing trench with ZVI. Fill out the remaining depth with soil. General longevity of ZVI is > 15 years. However, this is site-specific (treatability study may be needed) • Performance monitoring will be needed for the PRB.	$1M [c]
#4 Slurry Wall to Enclose the Entire Site	• Approx. length = 6,000 feet • On the eastern and southern ends, replace gravel and fill in the existing GIT with soil-bentonite slurry or concrete up to 2 feet of the surface. • On the western and northern ends, construct a new slurry wall. • Groundwater management may be needed because groundwater seems to be within a few feet of the surface near Cleanout #1 and Sump #1.	$1.7M [a]
#5 No change to the existing system of GIT and water treatment	• Continue to use existing GIT and water treatment plant.	??

Notes [a] Does not include O&M or groundwater management costs.
[b] Does not include O&M or performance monitoring costs.
[c] Does not include O&M, performance monitoring, or groundwater management costs.

ATTACHMENT B

FANSTEEL REMOVAL OPTIONS AND ESTIMATED COSTS

FANSTEEL/FMRI SITE REMOVAL OPTIONS INDENTIFIED
(see attached figure for locations)

- Former Pond 2 - The open trench had the highest gamma readings noted during the July 2019 survey (45X background). Using a planning task order to evaluate making this location a temporary repository for all on-site radioactive material. Evaluation includes suitability of this site compared to others on site; likelihood of inundation and or damage from flooding; potential to use in-situ treatments to reduce isotope mobility (like lime for example); and protection of groundwater and surface water and other factors.
  - Estimated dimensions of Pond 2 are 200 ft x 100 ft x 8 ft. The actual dimensions need to be verified plus any liner (clay) information. Approximately 6,000 cubic yards of material from the site could be placed in this area and capped temporarily with HDPE at$60,000 to $80,000 (this is similar to covering soil stockpile area with HDPE).

- Sodium Reduction Building - Contains 1,000 to 2,000 one-ton "supersacks" of soil contaminated with isotopes of uranium and thorium. The way the sacks are stacked, and the potential condition of the sacks will need to be evaluated before a plan to sample or move them can be created. ODEQ staff have expressed concern regarding tornadic activity at the site dispersing contents of sacks. Currently using a planning task order to evaluate:
  - Safety of material at its current location; do we need any engineering controls (results expected within the month)
  - Moving material to a temporary on-site repository at the most suitable location as determined by the results of the planning task order (cost estimate expected within the month)
  - Assumes 2,000 supersacks at 1 cubic yard each or 2,000 cubic yards of material. This material could be placed in Pond 2 at a cost of approximately $30,000 to $50,000. Assumes moving the supersacks at a cost of $15/yard (2,000 cubic yards x $15/yard).
  - Off-site disposal to White Mesa, UT (2,000 miles RT) is estimated at $1,675,000. This is based on 170 loads of material disposal at $275/ton disposal; unload/decon fee of $1,000/ load; mileage at $2/mile.
  - WCS in Andrews, TX is 600 miles RT but I have not investigated this avenue yet.

- Soil Stockpile - This soil was collected from French drains around now closed ponds. The July 2019 gamma survey indicated 27X background gamma radiation. The stockpile is covered above and below with an HDPE liner. Options:
  - Cover old liner with sand to smooth and cover all with new upper HDPE liner (estimated cost $68,000 to $80,000)
  - Determine if this soil is suitable to close the existing open trench at the Former Pond 2; making that a defacto temporary on-site repository (cost estimate expected within the month)
  - Ship off-site for disposal (cost estimate expected next week)
  - Estimated dimensions of the soil stockpile are 200 ft x 150 ft x 15 ft or 17,000 cubic yards, but this is very conservative. This stockpile slopes toward all edges and it is estimated at 15 ft in height. Need to verify but placement in Pond 2 may not be feasible due to volume.

- Off-site disposal to White Mesa, UT (2,000 miles RT) is estimated at $11,675,000. This is based on approximately 1,400 loads of material at $275/ton disposal; unload/decon fee of $1,000/load; mileage at $2/mile.
- WCS in Andrews, TX is 600 miles but I have not investigated this avenue yet.

- Gamma Anomalies at Pond 6 and outside Sodium Reduction building - Using planning task order to evaluate source of gamma radiation and develop plan to move radioactive isotopes to on-site repository at the most suitable location as determined by the results of the planning task order.
- Excavating and moving soil around the site can be accomplished at about $10/yard. This material could be placed in Pond 2 area.

- Groundwater and Surface Water Treatment - The facility uses a trench and sump treatment system to capture groundwater from an unconfined alluvial aquifer. The system captures approximately 14,000 gallons per day (gpd). The system is designed to treat metals only and treatment is by manual addition of lime to raise pH and drop metals into several settling ponds set in series. In addition, the facility is under order from the NRC to treat surface and groundwater prior to discharge under a NPDES permit (NPDES Permit requirements attached). This treatment includes partially closed Pond 3 and its associated French drain (15,000 gpd). WIP has been removed from Pond 3. The pond still contains residual radioactive isotopes, chromium, cobalt, manganese, zinc, and mercury. Currently using planning task order to evaluate:
    - Closing and capping Pond 3 to potentially reduce generation of contaminated groundwater;
    - Evaluating whether treatment system is capturing chlorinated solvents and, if so, is system adequate to treat them; and
    - Upgrading antiquated manual treatment system.
    - Preliminary results of study expected in
    - Need more time to understand this system.

ATTACHMENT C

FANSTEEL SOIL STOCKPILE RISK CHARACTERIZATION REPORT

SOIL STOCKPILE
STREAMLINED RISK CHARACTERIZATION REPORT
FANSTEEL METALS/FMRI STOCKPILE STRATEGY
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

1 INTRODUCTION

The purpose of this document is to present the results of a streamlined risk characterization of the soil stockpile area located on the Fansteel Metals/FMRI (Fansteel) site (Site) in Muskogee, Muskogee County, Oklahoma. The risk characterization will also include derivation of potential cleanup levels given various potential applicable or relevant and appropriate requirements (ARARs).

2 BACKGROUND

Fansteel operated a metal processing facility that produced tantalum and columbium metal products from 1957 to 1989. U.S. Environmental Protection Agency (EPA) contractors conducted a Site Inspection (SI) of the Site in October 1981 that included the collection of one soil sample and one sediment sample at outfall and seepage locations from the Site to the Arkansas River. Based on the analytical results, an observed release to surface water was documented (Weston Solutions, Inc. [WESTON], 2019). In June 2018, the Oklahoma Department of Environmental Quality (ODEQ) performed a Preliminary Reassessment of the Site, the results of which indicated that further sampling at the Site was warranted (same). As part of an Expanded Site Inspection (ESI) conducted at the Site by Superfund Technical Assessment and Response Team (START) in April 2019, one soil sample and one duplicate soil sample were collected from a stockpile of soils located under a tarp and south of the research and development (R&D) building. The stockpile consists of approximately 17,000 cubic yards of soil excavated during the installation of a groundwater interceptor trench in 1999.

Analytical results from the soil stockpile indicated concentrations of the following Hazard Ranking System (HRS) significant contaminants (contaminants considered a hazardous substance with high toxicity/bioaccumulation factor values):

- Semivolatile organic compounds (SVOCs) – acenapthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene,

benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3)pyrene, naphthalene, phenanthrene, pyrene;

- Metals – arsenic, chromium, iron, lead, magnesium, manganese, selenium, silver, zinc, mercury;
- Polychlorinated biphenyls (PCBs) – aroclor 1254; and
- Radionuclides – radium-226 (Ra-226), radium-228 (Ra-228), thorium-228 (Th-228), thorium-230 (Th-230), thorium-232 (Th-232), uranium-234 (U-234), uranium-235 (U-235), and uranium-238 (U-238) above background.

The soil stockpile sample analytical results for SVOCs, metals, and PCBs are provided in Attachment 1. The analytical results for radionuclides are presented in Table 2-1.

Table 2-1
ESI Soil Stockpile Sample Results – Radionuclides

	Soil Stockpile	
	Field Sample	**Field Duplicate Sample**
	SS-STP-20190408	**SS-DUP1-20190408**
Analyte	**picoCuries per gram (pCi/g)**	
Ra-226	**88.1**	81.5
Ra-228	**18**	15.2
Th-228	16.1	**18.5**
Th-230	63	**72**
Th-232	15.8	**18.6**
U-234	42.7	**47.3**
U-235	2.48	**2.69**
U-238	44.5	**48.7**

Weston, 2019
pCi/g -picoCuries/gram
Ra – radium
SS – Soil sample
STP – stockpile
Th – thorium
U – uranium
DUP - Duplicate
Bold values are the greater of the normal and duplicate sample results.
U-238 decay chain: U-238, U-234, Th-230, Ra-226
Th-232 decay chain: Th-232, Th-228, Ra-228
U-235 was the only radioisotope analyzed within its decay chain.

In July 2019, EPA National Center for Radiation Field Operations (NCRFO) and EPA Region 6 conducted qualitative gamma survey scans at the Site, including one of the soil stockpile, using the NCRFO Environmental Radiation Buggy Scanning System. The soil stockpile exhibited significant relative gamma activity, with a maximum measurement of 27 times the background value (National Center for Radiation Field Operations, Office of Radiation and Indoor Air, EPA, 2019). The southern one-third of the stockpile was capped in what appeared to be clean soil that shielded the material beneath to near background values (same).

In their report, the NCRFO noted the gamma scan survey results stated that the raw material (ore) used for tantalum and niobium production contained uranium and thorium as naturally occurring trace constituents. The concentrations of natural uranium and natural thorium were sufficient at Fansteel to cause the ores and slags to be classified as source materials by the Atomic Energy Commission (AEC), which originally issued License No. SMB-911 in 1967 to Fansteel (National Center for Radiation Field Operations, Office of Radiation and Indoor Air, EPA, 2019). The current status of the License can be found at https://www.nrc.gov/info-finder/decommissioning/complex/fmri-fansteel-inc.html.

3 STREAMLINED RISK CHARACTERIZATION

A streamlined risk characterization of the soil stockpile included an analysis of radiological and non-radiological risk.

3.1 RADIOLOGICAL RISK

The soil stockpile radiological analytical results in Table 2-1 were screened against local background concentrations to determine the contaminants of potential concern (COPCs). No radiological soil background samples were collected at the Fansteel Site during the ESI; however, the sample radiological analytical results were significantly greater than off-site background soil concentrations reported in the Fansteel Decommissioning Plan (Earth Sciences Consultants, 2003). Off-site soil background concentrations are provided in Table 3-1.

Table 3-1
Off-site Soil Background Results – Radionuclides

Analyte	Mean Off-site Soil Background picoCuries per gram (pCi/g)
U_{total}	1.1 +/- 0.6
Th_{total}	3.3 +/-0.9
Ra-226	1.0 +/- 0.1
Ra-228	1.2 +/- 0.2

Earth Sciences Consultants, Inc., 2003
Ra – radium
Th - thorium
U – uranium
U_{total}: sum of concentrations of U-238, U-235, and U-234
Th_{total}: sum of concentrations of Th-234, Th-232, Th-231, Th-230, Th-228, Th-227

Additionally, the soils stockpile exhibited significant relative gamma activity, with a maximum measurement of 27 times background, during a 2019 gamma scan survey by the NCRFO. Therefore, uranium, thorium, and radium were considered COPCs and were carried forward to a streamlined risk characterization.

Cancer is the major effect of concern from radionuclides. Uranium and thorium occur in three natural decay chains, headed by U-238, U-235, and Th-232, respectively (Attachment 2). Isotopes of radium appear in each of the three decay chains. In nature, the radionuclides in these three chains are approximately in a state of secular equilibrium, in which the activity concentrations of all radionuclides within each series are nearly equal. Additional information on uranium, thorium, and radium at the Fansteel Site can be found in *Radiological and Chemical Fact Sheets to Support Health Risk Analyses for Contaminated Areas* (Argonne National Laboratory, 2007).

Using the analytical results in Table 2-1, START calculated the radiological risk of the soils stockpile for an Outdoor Worker with the EPA Preliminary Remediation Goal (PRG) Calculator for Radionuclides (EPA, 2019). START used the greater analytical result between the normal and duplicate samples for each radioisotope to be conservative; results were greater for the duplicate sample for uranium and thorium and greater for the normal sample for radium. It should be noted that based on the single normal and duplicate sample results of the soils stockpile, the Th-232 decay chain appears to be essentially in equilibrium, whereas the U-238 decay chain shows the

Ra-226 concentration approximately 22% greater than the Th-230 concentration and approximately 84% greater than the U-238 and U-234 concentrations. Therefore, the concentration for Th-232 was used for the entire decay chain. Within the U-238 decay chain, secular equilibrium was assumed for "sub-" decay chains U-238 through protactinium-234 (Pa-234) and Ra-226 through polonium-210 (Po-210). The entire U-235 decay chain was assumed to be in secular equilibrium, given that a result is provided solely for U-235. (Although the U-235 decay chain may likely exhibit a similar disequilibrium ratio as the U-238 decay chain (Ra-226 concentration 84% greater than U-238 concentration) between Ra-223 and U-235, the risk of the U-235 decay chain in equilibrium contributes only 0.6% of the total risk. Noting that radiological risk is linear, doubling the risk of the U-235 decay chain [100% disequilibrium] would result in the risk of the U-235 decay chain contributing only 0.8% of the total risk and is deemed inconsequential, given the level of effort required to apply unequal concentrations.)

Three exposure pathways are included in the Outdoor Worker land-use template in the PRG Calculator: (1) incidental ingestion of soil; (2) inhalation of soil particulates; and (3) external exposure to gamma radiation in soil. PRG default values, which represent reasonable maximum exposure to broad-based populations, and are typically 90 to 95 percentile values and well above the mean, were used for all parameter values except for the area of contamination. A contaminated area of 2,000 square meters (m^2) was used; the approximate, conservative size of the soils stockpile using the scale on the ESI Sample Location Map (WESTON, 2019). Although the southern one-third of the stockpile was capped in what appeared to be clean soil that shielded the material beneath to near background values, which would result in a more realistic contaminated area of approximately 1,333 m^2, the nearest value in the PRG Calculator parameter menu above 1,333 was 2,000 m^2. The input values are provided in Attachment 3.

The risk of the soils stockpile for an Outdoor Worker is calculated to

$$\mathbf{4.33 \times 10^{-3}},$$

an order of magnitude greater than the largest value of the range within which EPA manages excess lifetime carcinogenic morbidity risk, 10^{-4} to 10^{-6}. The U-238, U-235, and Th-232 decay-chain

radioisotopes are contaminants of concern (COCs). The PRG Calculator risk output is provided in Attachment 3.

3.1.1 Principal Threat Waste

The EPA *A Guidance on Principal Threat and Low Level Threat Waste* recommends treatment of principal threat waste when practicable (EPA, 1991). The guidance aligns with, and supports, the National Contingency Plan (NCP), promulgated on 8 March 1990 that states that EPA expects to use treatment to address the principal threats posed by a site, wherever practicable (40 Code of Federal Regulations [CFR] Section 300.430(a)(1)(iii)). No "threshold level" of toxicity/risk has been established to equate to "principal threat"; however, where toxicity and mobility of source material combine to pose a potential risk of 10^{-3} or greater, generally, treatment alternatives should be evaluated (same). Based on a risk of 4.33×10^{-3}, the soils stockpile meets the *general* definition of a principal threat waste.

3.1.2 ARARs and TBCs

All remedial actions at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites must be protective of human health and the environment and must comply with ARARs unless a waiver is justified. Cleanup levels for response actions under CERCLA are developed based on site-specific risk assessments, ARARs, and/or to-be-considered (TBC) material. The determination of whether a requirement is applicable, or relevant and appropriate, must be made on a site-specific basis (40 CFR Part 300.400(g)).

3.1.2.1 EPA Regulations

EPA regulations that apply to soil concentrations of radioactive elements are promulgated in 40 CFR 192, entitled, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings." In 1983, EPA promulgated in 40 CRF 192, Subpart B *Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites.* These standards were developed pursuant to Section 275 of the Atomic Energy Act (AEA) of 1954, as amended by Section 206 of the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, and were developed specifically for the cleanup of uranium mill tailings at 24 named sites designated under Section 102(a)(1) of UMTRCA (Title 1 sites). The list of 24 Title 1 sites is a closed set chosen in 1979, to which

additional sites cannot be added. 40 CFR 192.12(a) specifies that the concentration of Ra-226 in land averaged over an area of 100 m^2 shall not exceed background by more than:

1. Five picoCuries per gram (pCi/g) averaged over the first 15 centimeters (cm) of soil below the surface; and
2. Fifteen pCi/g averaged over 15 cm-thick layers of soil more than 15 cm below the surface.

40 CFR 192.12(b) further stipulates that *in any occupied or habitable building*:

1. The objective of any remedial action, within reasonable means, should be to achieve an annual average (or equivalent) radon product concentration (including background) not to exceed 0.02 working level ("WL"), and that in any case 0.03 WL should not be exceeded; and
2. Gamma radiation levels should not exceed 20 microRoentgens per hour (µR/hr) above background.

Note that the concentration criterion for subsurface soils, 15 pCi/g, is not a health-based standard, but was developed for use in limited circumstances as a tool for locating and remediating discrete deposits of high, subsurface radioactivity (greater than 30 pCi/g; typically 300 to 1,000 pCi/g) in subsurface locations at mills. The 15 pCi/g subsurface standard is expected to achieve, in fact, an actual subsurface cleanup level of 5 pCi/g (EPA, 1998).

The 5 pCi/g and 15 pCi/g standards were initially developed for the single radionuclide Ra-226; however, in Subpart E of 40 CFR 192, *Standards for Management of Thorium Byproduct Pursuant to Section 84 of the AEA of 1954, as Amended,* EPA determined that the standards were suitable for remediation of Ra-228, a radioisotope in the Th-232 decay chain, at Title II sites. Uranium-ore-processing sites addressed by Title II of UMTRCA were active when the Act was passed in 1978.

The standards contained within Subparts B and E of 40 CFR 192 **are potentially *applicable* requirements for UMTRCA Title I and Title II sites only**, respectively (EPA, 1998). Waste rock or ore stock piles at abandoned or active metal processing facilities such as Fansteel are not subject to these regulations, since these materials have not been milled or processed specifically for uranium. That is, Fansteel is neither an UMTRCA Title I nor a Title II site.

However, if the contaminants at a site are the same (i.e. Ra-226, Ra-228, and/or thorium) and the distribution of contamination (little subsurface contamination between 5 pCi/g and 30 pCi/g; i.e.,

most subsurface contamination is greater than 30 pCi/g) is similar to that of Title I and Title II sites, the UMTRCA soil cleanup standards **may be *relevant and appropriate* requirements for CERCLA sites** (EPA, 1998). Because the risk from uranium and thorium byproducts is additive (i.e., both carcinogenic risk), these standards should apply to the combined level of contamination of Ra-226 and Ra-228. Note that to achieve a permanent cleanup objective of 5 pCi/g for Ra-226 and Ra-228, there needs to be assurance that the preceding radionuclides in the decay chains will not be left behind at levels that will permit the combined radium activity to build up to levels greater than 5 pCi/g after the completion of the response action. At a minimum, this means that Th-230 and Th-232 should be cleaned up to the same combined 5 pCi/g as their radium daughters.

For cover-material performance on inactive uranium and thorium mill sites, 40 CFR 192.32(a)(4) establishes the standard for radon-222 (Rn-222) flux at 20 picoCuries/square meter-second (pCi/m^2-s). Additionally, implemented control measures must remain effective for up to 1,000 years to the extent reasonably achievable, and in any case, for at least 200 years [40 CFR 192.32(b)(1)(i)]. Although ***not applicable*** requirements, these cover-material performance standards **are *potentially relevant and appropriate* requirements** for CERCLA sites and thus the Fansteel Site.

Finally, CERCLA Removal Process defined in 40 CFR 300.415 establishes methods and criteria for determining the extent of response when there is a release into the environment of a hazardous substance or any pollutant that may represent an imminent and substantial danger to public health or welfare. The goal of the investigation and remedy selection process under CERCLA is to select remedies that are protective of both human health and the environment, that maintain protection over time, and that minimize untreated waste. The investigation and evaluation of remedies is described in 40 CFR 300.430 – Remedial Investigation/Feasibility Study (RI/FS) and Selection of Remedy. Under CERCLA, remediation goals, which establish acceptable contaminant exposure levels that will be protective both of the environment and of human health under consideration of all potential exposure pathways, are developed by considering ARARs, if available, as well as factors including: For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}. Risk-based soil action levels can be developed thusly via EPA's online PRG Calculator for radionuclides. The CERCLA RI/FS process does not specifically apply to sites that

are not listed on the National Priorities List and thus **may not be an *applicable* requirement** for the Fansteel Site. However, the CERCLA RI/FS process **is a potentially *relevant and appropriate* requirement**.

3.1.2.2 NRC Regulations

National Response Center (NRC) regulations that relate specifically to protection of the general public from radiation are promulgated in 10 CFR 20: "Standards for protection against radiation," 10 CFR 40: "Domestic licensing of source material," and 10 CFR 61: "Licensing requirements for land disposal of radioactive waste." In 1985, the NRC promulgated standards under 10 CFR 40 (NRC's UMTRCA Rule) to address uranium mill tailings. The radium soil standards were intended as conforming standards to EPA's UMTRCA soil standards under 40 CFR 192 for Ra-226 and Ra-228, as detailed in Section 3.1.2.1.

The Fansteel Site is currently implementing a decommissioning plan pursuant to 10 CFR 20, Part E (20.1403) (https://www.nrc.gov/info-finder/decommissioning/complex/fmri-fansteel-inc.html). These regulations state, in part, the following:

1. The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the Total Effective Dose Equivalent (TEDE) from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 millirem per year (mrem/yr).
2. Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either:
    a. 100 mrem/yr; or
    b. 500 mrem/yr, provided that the licensee demonstrates that further reductions in residual radioactivity necessary to achieve 100 mrem/yr are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm.

The regulations in 10 CFR 20 **are potential *applicable* requirements.** Note that the Office of Solid Waste and Emergency Response (OSWER) Directive 9285.6-20, *Radiation Risk Assessment at CERCLA Sites: Q&A*, provides the Superfund guidance on what is considered a protective dose-based ARAR as 12 millirems per year (mrem/yr) above background, which achieves a $3x10^{-4}$ cancer morbidity risk (EPA, 2014). Under this guidance, a protective dose would need to equal

12 mrem/yr or less; if not, 12 mrem/yr would 'override' the NRC protective dose of 25 mrem/yr (or 100/500 mrem/yr) as the CERCLA site cleanup level. This CERCLA risk assessment guidance **is a potential *TBC.***

In 1999, the NRC amended its UMTRCA Rule by adding Criterion 6(6) to Appendix A *Radiological Criteria for License Termination of Uranium Recovery Facilities.* The amendment uses the existing soil radium standard (5 pCi/g surface; 15 pCi/g subsurface) to derive a dose criterion (benchmark approach) for cleanup of byproduct material, including radium, in soil and surface activity on structures. In areas where there is more than one residual radionuclide (i.e. radium, thorium, uranium), the benchmark dose applies to the sum of all radionuclide concentrations in that area. The benchmark approach requires licensees subject to the rule to calculate the potential peak dose to an individual at the site within 1,000 years from exposure to the residual levels allowed under the UMTRCA soil standard, excluding radon (radon is a radioisotope in the U-238, U-235, and Th-232 decay chains). Licensees are then to remediate the site such that all residual radionuclide concentrations remaining post-remediation on the site do not result in a dose greater than the calculated potential peak benchmark dose. Criterion 6(6) addresses the lack of remediation standards for radionuclides other than radium in soil at uranium recovery facilities, including radioisotopes above (e.g., Th-232, Th-230) and below (e.g., Pb-210 in U-238 decay chain) radium in the U-238 and Th-232 decay chains.

The radium benchmark dose standards contained within Criterion 6(6) **are potential *applicable* requirements** only for UMTRCA Title II sites. Again, Title II of UMTRCA addresses uranium-ore-processing sites that were active when the Act was passed in 1978. Waste rock or ore stock piles at abandoned or active metal processing facilities such as Fansteel are not subject to these regulations, since these materials have not been milled specifically for uranium. As stated previously, Fansteel is not a Title II site.

However, if the majority of radiological risk posed by contaminants in the soil at a site are the same (i.e., radium, thorium, uranium) as those existing at UMTRCA Title II sites, the Criterion 6(6) radium benchmark dose limit **is a potentially *relevant and appropriate requirement*** for those contaminants at a CERCLA site (EPA, 2000a). Note that assumptions used in rulemaking documents during the development of Criterion 6(6) and/or found in accompanying NRC guidance

documents, such as NRC's dose assessment methodology or its land-use assumption that the uranium recovery sites would be released for unrestricted use, would generally **not be considered *relevant and appropriate*** requirements under CERCLA (same). Benchmark Dose assessments *should* use, however, reasonable maximum exposure parameter values, i.e.; typically 90 to 95 percentile values and well above the mean, that are consistent with the reasonably anticipated future land use of the site (same). The radium benchmark dose from soil at CERCLA sites should be met for the sum of doses for both soil and structures (same).

Note that when developing a radium benchmark dose per Criterion 6(6) as a relevant and appropriate requirement for both surface and subsurface soils, a concentration value for radium of 5 pCi/g should be used, as opposed to using 15 pCi/g for subsurface soils. The reasons are stated in Section 3.1.2.1.

Note further that OSWER Directive 9285.6-20, *Radiation Risk Assessment at CERCLA Sites: Q&A*, referenced previously, provides the Superfund guidance on what is considered a protective dose-based ARAR as 12 mrem/yr, which achieves a $3x10^{-4}$ cancer morbidity risk (EPA, 2014). Under this guidance, a radium benchmark dose would need to equal 12 mrem/yr or less; if not, 12 mrem/yr would 'override' the radium benchmark dose as the CERCLA site cleanup level. This fact is noted in OSWER Directive 9200.4-35P (EPA, 2000a); however, it considers 15 mrem/yr as presumptively protective of human health, which has been superseded by 12 mrem/yr per OSWER 9285.6-20. As stated previously, this CERCLA risk assessment guidance **is a potential *TBC***.

3.1.2.3 MARSSIM

The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) provides a multi-agency (EPA, NRC, Department of Energy [DOE]) approach to conducting radiation surveys and investigations at potentially contaminated sites, with a focus on contaminated surface soil and building surfaces. The purpose of MARSSIM is to provide a standardized approach to demonstrating compliance with a dose- or risk-based regulation. MARSSIM does not establish cleanup criteria for reclamation of radioactively contaminated sites, but states that the affiliated agencies' regulations and policies support 15 mrem/yr and/or 25 mrem/yr dose-based health-protective standards (EPA, 2000b). EPA's dose-based health protective standard was revised from 15 mrem/yr to 12 mrem/yr in 2014 after the publication of MARSSIM; 12 mrem/yr is equivalent

to a carcinogenic morbidity risk of $3x10^{-4}$ (EPA, 2014). MARSSIM is guidance, not a promulgated standard, and thus is not an ARAR, though **it may be applied as a *TBC***.

3.1.2.4 OSHA

The Occupational Safety and Health Administration (OSHA) has promulgated standards for the protection of workers who may be exposed to hazardous substances at Resource Conservation and Recovery Act (RCRA) or CERCLA sites (29 CFR Parts 1910.1096, 1910.120, and 1926.65). EPA requires compliance with OSHA standards in the NCP (40 CFR 300.150), but not through the ARAR process. Therefore, **OSHA standards are *not considered ARARs***. Since the requirements, standards, and regulations of OSHA are not ARARs and cannot be waived, they would be complied with during the removal action.

3.1.2.5 State Regulations

Oklahoma has not promulgated standards or established guidelines for the protection from radiation in soils. Two states, Texas and New Mexico, have such standards and guidelines that may be instructive as TBCs for the Fansteel Site. Texas has promulgated standards for the protection from radiation in soils, while New Mexico has established guidelines for the cleanup and reclamation of existing uranium mining operations. Title 30 of the Texas Administrative Code (TAC), Section 336.1115(e), establishes soil cleanup standards for Ra-226 and Ra-228 at source-material recovery facilities. Under Section 336.1115(e), outdoor areas are considered suitable for release for unrestricted use if the concentration of Ra-226 or Ra-228 in soil, averaged over any 100 m^2, does not exceed the background level by more than 5 pCi/g averaged over the first 15 cm of soil below the surface, and may not exceed the background level by more than 15 pCi/g, averaged over 15 cm-thick layers of soil more than 15 cm below the surface.

Additionally, Section 336.1115(e) states that byproduct material containing concentrations of radionuclides other than radium in soil (e.g., natural uranium, natural thorium, lead-210) must not result in a total dose exceeding the dose from cleanup of radium-contaminated soil to the standard listed in the preceding paragraph and must be at levels that are as low as reasonably achievable (ALARA). This dose is referred to as the radium benchmark dose. Section 336.1115(e) is compatible with the NRC's standards under 10 CFR Part 40 (NRC's UMTRCA Rule) to address

uranium mill tailings and the NRC's 1999 UMTRCA Rule Amendment Criterion 6(6) to Appendix A.

New Mexico established guidance in 2016 to assist mine site responsible parties in addressing soil radiation at existing uranium mines as part of reclamation activities (New Mexico Energy, Minerals and Natural Resources Department [NMEMNRD] and New Mexico Environment Department [NMED], 2016). Surface reclamation of mine sites falls under the jurisdiction of the New Mexico Mining Act (NMMA). The NMMA is administered under the New Mexico Mining Commission (NMMC) regulations (19.10 New Mexico Administrative Code [NMAC]). The NMMC regulations apply to all currently operating mines as well as to mines that operated for a minimum of 2 years between 1 January 1970 and 18 June 1993, which is the effective date of the NMMA.

The guidance states that the goal of mitigating mine site radiation levels is to be compliant with 40 CFR 192.12, 40 CFR 192.32, and 10 CFR 40, such that remedial actions shall provide reasonable assurance that:

1. The concentration of Ra-226 in land averaged over any area of 100 m^2 shall not exceed the background level by more than:
   a) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and
   b) 15 pCi/g, averaged over 15 cm-thick layers of soil more than 15 cm below the surface.
2. Site post-reclamation radiation level (PRRL) for gamma radiation should not exceed the site-specific value of gamma radiation that correlates to 5 pCi/g Ra-226 above background at the 95th percentile value. For example, at an existing mine site, the value of gamma radiation that correlates to a maximum Ra-226 activity of 5 pCi/g above background in soil may be determined to be 20 µR/hr above background, which would then be designated as the site-specific PRRL.
3. For sites at which contaminated material exceeding the target radium activity level discussed above is emplaced in an on-site repository, cover material for the repository must achieve radon flux equal or less than 20 pCi/m^2-s.

The New Mexico guidelines do not include the radium benchmark approach under the NRC's UMTRCA Rule amendment Criterion 6(6) to Appendix A. The Texas regulations and New Mexico guidelines are state-specific and **cannot be *ARARs*** for the Fansteel Site. However, **both are potential *TBCs***.

3.1.2.6 Summary of ARARs and TBCs

A summary of potential ARARs and TBCs described in Sections 3.1.2.1 through 3.1.2.5 is provided in Table 3-1.

Table 3-1
Potential ARARs and TBCs

Agency	Description and Reference	Standard	Potential ARAR or TBC?
EPA	40 CFR 192 UMTRCA Rule	Per 100 m^2, 5 pCi/g Ra-226 for surface/subsurface or 15 pCi/g below 15 cm for discrete, high-activity pockets. Rn-222 flux of 20 pCi/m2-s for cover material.	Yes, ARAR
EPA	40 CFR 300.430 CERCLA RI/FS Process and Guidance	None; Soil action levels can be developed via PRG Calculator to achieve cancer risk between 10-4 and 10-6. Guidance proposes max 12 mrem/yr target dose for dose-based ARARs as protective, equal to risk of 3x10-4	Yes, ARAR (RI/FS Process); TBC (Guidance)
NRC	10 CFR 20, Part E (20.1403)	With institutional controls, TEDE above background of 25 mrem/yr; 100 mrem/yr if controls removed or 500 mrem/yr if conditions met.	Yes, ARAR (EPA CERCLA Guidance of 12 mrem/yr may 'overide' as TBC)
NRC	10 CFR 40 UMTRCA Rule plus Criterion 6(6) to Appendix A	Same as EPA UMTRCA Rule, plus Radium Benchmark Dose (Target dose from all residual radioisotopes, excluding radon, = dose from 5 pCi/g Ra-226)	Yes, ARAR
EPA, NRC, DOE	MARSSIM; joint guidance to meet Agencies' radiation regulations for soil and structures	None; supports EPA (12 mrem/yr) and DOE/NRC (25 mrem/yr) protective dose targets	Yes, TBC
OSHA	29 CFR Part 1910.1096	None; Rad Worker exposure standard of 5,000 mrem/yr	No
Texas	TAC Section 336.1115(e)	Similar to NRC UMTRCA standard	Yes, TBC

Agency	Description and Reference	Standard	Potential ARAR or TBC?
New Mexico	19.10 NMAC	Similar to EPA UMTRCA standard	Yes, TBC
Oklahoma	-	No soils standard or guidance	-

3.2 NON-RADIOLOGICAL RISK

Given time and budget constraints for this streamlined risk characterization, the non-radiological risk (metals, PCBs, SVOCs) posed by the soils stockpile was not evaluated. Given the nature of the stockpile as having a reasonably known extent of contamination, both horizontally and vertically, any removal action contemplated to address the radiological risk of the stockpile will also address the non-radiological risk.

4 CLEANUP LEVEL

Three potential radiological risk-associated ARARs described in Sections 3.1.2.1 and 3.1.2.2 require additional calculations to show compliance with their requirements. The potential ARARs are the 40 CFR 192.32(a)(4) standard, which requires calculation of a cover-thickness that would achieve Rn-222 flux of 20 pCi/m^2-s; 10 CFR 40 Criterion 6(6) to Appendix A, which requires calculation of a Radium Benchmark Dose and then Single Radionuclide Guideline Level concentrations for all present residual radionuclides that would, combined, achieve the Radium Benchmark Dose; and 40 CFR 300.430, which requires, if the soil stockpile were left in place, calculation of a cover-thickness that would achieve a cancer morbidity risk of 10^{-4} to 10^{-6}.

4.1 REPOSITORY COVER THICKNESS FOR RN-222 FLUX

Pursuant to 40 CFR 192.32(a)(4) as a potential relevant and appropriate requirement at the Site, a repository cover thickness that would achieve Rn-222 flux of 20 pCi/m^2-s, given the soils stockpile maximum sample radium result of 88.1 pCi/g, was calculated using formulas from NRC Regulatory Guide 3.64 (NRC, 1989). A sufficient cover thickness was calculated to be:

60 cm (approximately 2 feet).

However, since it is unknown how representative the single grab soil sample is of the stockpile, cover thicknesses were calculated to achieve Rn-222 flux of 20 pCi/m^2/s for radium concentrations that range from less than to greater than 88.1 pCi/g.

23 cm (approximately 0.75 feet), assuming 44 pCi/g Ra-226
40 cm (approximately 1.31 feet), assuming 60 pCi/g Ra-226
67 cm (approximately 2.20 feet), assuming 100 pCi/g Ra-226
78 cm (approximately 2.56 feet), assuming 125 pCi/g Ra-226

The repository cover-thickness calculation results are provided as Attachment 4.

4.2 RADIUM BENCHMARK DOSE

Pursuant to 10 CFR 40, Criterion 6(6) to Appendix A as a potential relevant and appropriate requirement at the Site, a Radium Benchmark Dose was calculated using DOE's Residential Radioactive (RESRAD) On-Site Code (Argonne National Laboratory, 2016). The same Outdoor Worker scenario was established in RESRAD as the one used for the risk calculation in the PRG Calculator in Section 4.1, with three pathways of exposure: (1) incidental ingestion of soil; (2) inhalation of soil particulates; and (3) external exposure to gamma radiation in soil. To the maximum extent possible, the default parameter values in the PRG Calculator Outdoor Worker scenario were used; otherwise, RESRAD default values were used, which also represent reasonable maximum exposure values. PRG Calculator default values for inhalation rate, exposure duration, outdoor and indoor time fractions, and soil ingestion rate were able to be used as RESRAD input parameters. A site-specific, contaminated area of 2,000 m^2 was used, the approximate size of the soils stockpile (the area of the soils stockpile is approximately 2,800 m^2 [conversation with Site personnel]; however, the PRG Calculator requires selection of 'contaminated area' from a pre-set menu that includes the closest available values of 2,000 m^2 and 5,000 m^2). The input values are provided in Attachment 5.

The Radium Benchmark Dose for an Outdoor Worker exposed to 5 pCi/g of Ra-226 calculated to:

8.41 mrem/yr at t=0.0 years.

Note that this value is below the recommended maximum protective dose per CERCLA guidance (EPA, 2014) of 12 mrem/yr. The RESRAD Radium Benchmark Dose output is provided in Attachment 5.

Using the Radium Benchmark Dose of 8.41 mrem/yr, Single Radionuclide Guideline Level (SRGL) concentrations were then calculated with the RESRAD On-Site Code for radionuclides in the U-238, Th-232, and U-235 decay chains. The same input parameter values as described for calculation of the Radium Benchmark Dose for an Outdoor Worker were used in the calculations. The SRGL concentrations at the time of maximum dose (t=0.0 years) can be found in the RESRAD output provided in Attachment 6 (page 24) and in Table 4-1.

The SRGLs are the concentrations at which each subject radionuclide would alone produce a dose equivalent to the radium benchmark dose of 8.41 mrem/yr. The SRGL concentrations should be used with the Unity Rule to ensure that the sum of the ratios of each radioisotope to its SRGL equals less than Unity, i.e., '1'.

Table 4-1
Single Radionuclide Guideline Levels
Target Maximum Acceptable Dose = Radium Benchmark Dose = 8.41 mrem/yr

Uranium-238 Decay Chain	
	picoCuries per gram (pCi/g)
U-238	281
U-234	3,382
Th-230	418
Ra-226	***5.00***
Pb-210	243
Po-210	647
Uranium-235 Decay Chain	
U-235	61.0
Thorium-232 Decay Chain	
Th-232	104
Ra-228	8.19
Th-228	7.03

As an alternative to the SRGLs, a 'cumulative' action level for Ra-226 can be calculated that accounts for all risk from the U-238, U-235, and Th-232 decay chains, under the assumption that the ratios of the concentrations of other radioisotopes in each of these decay chains to the Ra-226 concentration in the ESI soil stockpile sample are characteristic of the entire soil stockpile. To this end, a concentration of 1 pCi/g for Ra-226 and the ratio of the concentration of each radioisotope in Table 2-1 to the Ra-226 concentration were used as input concentration values in RESRAD. The total annual dose for these concentrations for an Outdoor Worker calculated to 2.26 mrem/yr at t = 0.0 years (see page 13 of Attachment 6). Dividing 2.26 mrem/yr per 1 pCi/g of Ra-226 into the Radium Benchmark Dose value of 8.41 mrem/yr yields a 'cumulative' action level of:

3.72 pCi/g of Ra-226.

In this manner, the 'cumulative' action level for Ra-226 can be used without employing the Unity Rule. The 'cumulative' action level would provide a savings to post-removal, confirmation sample analytical costs by requiring analysis solely for Ra-226.

4.3 CANCER MORBIDITY RISK RANGE OF 10-4 TO 10-6

Pursuant to 40 CFR 300.430 as a potential relevant and appropriate requirement at the Site, a cover thickness that would achieve a cancer morbidity risk of 10^{-4} to 10^{-6}, if the soils stockpile were left in place, was calculated with the maximum stockpile sample radium result of 88.1 pCi/g for an Outdoor Worker with the EPA PRG Calculator for Radionuclides (EPA, 2019). A target maximum risk level of $3x10^{-4}$ was used based on OSWER Directive 92856.6-20 (EPA, 2014). To save time and effort, the calculation was performed using just Ra-226 and progeny, since it is, to a significant degree, the largest contributor of risk for an Outdoor Worker. A sufficient cover-thickness was calculated to be:

30 cm (approximately 1 foot) ($2.7x10^{-4}$ risk).

However, since it is unknown how representative the single, grab, soil sample is of the stockpile, cover-thicknesses were calculated to achieve $3x10^{-4}$ risk for radium concentrations that range from less than to greater than 88.1 pCi/g.

18 cm (approximately 0.59 feet), assuming 44 pCi/g Ra-226
26 cm (approximately 0.85 feet), assuming 60 pCi/g Ra-226
30 cm (approximately 0.98 feet), assuming 100 pCi/g Ra-226

40 cm (approximately 1.31 feet), assuming 125 pCi/g Ra-226

The stockpile cover-thickness calculation results are provided as Attachment 7.

5 CONCLUSION

Based on the analytical results of one soil sample collected at the soils stockpile on the Site during the April 2019 ESI, the radiological risk of the soils stockpile to an Outdoor Worker, using the Outdoor Worker template in EPA's PRG Calculator for Radionuclides, equals **4.33×10^{-3}**, an order of magnitude greater than the largest value of the range within which EPA manages excess lifetime carcinogenic morbidity risk, 10^{-4} to 10^{-6}. Based on this risk, the radioisotopes of the U-238, U-235, and Th-232 decay chains are COCs. Furthermore, based on this risk, the soil stockpile meets the definition of a principal threat waste.

Pursuant to EPA's UMTRCA Rule as a potential ARAR for an emergency removal at the Site, a cover-thickness for a remedy that would include capping the soils stockpile in place was calculated using radon flux formulas in NRC Regulatory Guide 3.6.4 to equal **60 cm (approximately 2 feet)**. Additional cover-thicknesses were calculated assuming varying representative Ra-226 concentrations of the soils stockpile other than a single, grab sample result; using Ra-226 concentrations of 44, 60, 100, and 125 pCi/g, cover-thicknesses ranged from **23 cm (0.75 feet) to 78 cm (2.56 feet)**.

Pursuant to 40 CFR 300.430 as a potential ARAR for an emergency removal at the Site, a cover-thickness for a remedy that would include capping the soils stockpile in place was calculated with the EPA PRG Calculator for Radionuclides to equal **30 cm (approximately 1 foot)**. Additional cover-thicknesses were calculated assuming varying representative Ra-226 concentrations of the soils stockpile other than a single grab sample result; using Ra-226 concentrations of 44, 60, 100, and 125 pCi/g, cover-thicknesses ranged from **18 cm (0.59 feet) to 40 cm (1.31 feet)**.

Thus, for a potential remedy of capping the soils stockpile in place, assuming a possible range of Ra-226 concentrations from 44 pCi/g to 125 pCi/g represent the stockpile accurately, soil cover-thicknesses ranging from **18 cm (approximately 0.6 feet) to 78 cm (approximately 2.6 feet)** would provide protection required if EPA's UMTRCA Rule and 40 CFR 300.430 were considered ARARs and/or TBCs.

Finally, pursuant to NRC's UMTRCA Rule Criterion 6(6) to Appendix A as a potential ARAR for a remedy that would include removal of the soils stockpile (e.g., for off-site disposal), a radium benchmark dose was calculated with DOE's RESRAD On-Site 7.2 Code to equal **8.41 mrem/yr**; associated SRGLs were also calculated with RESRAD and are provided in Table 4-1. Finally, as an alternative to the SRGLs, and as a potential analytical cost-saving measure, a 'cumulative' action level for Ra-226 that accounts for all residual radionuclide risk at the Site was calculated with RESRAD to equal **3.72 pCi/g of Ra-226**.

Given time and budget constraints for this streamlined risk characterization, the non-radiological risk posed by the soils stockpile was not evaluated. Given the nature of the stockpile as having a reasonable known extent of contamination both horizontally and vertically, however, any removal action contemplated to address the radiological risk of the stockpile will also address the non-radiological risk.

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7 ATTACHMENTS

Attachment 1	ESI Soil Stockpile Sample Results – SVOCs, Metals, and PCBs
Attachment 2	Uranium and Thorium Decay Chains
Attachment 3	PRG Calculator Risk Calculation Results
Attachment 4	Cover Thickness Calculation Results for Radon Flux
Attachment 5	RESRAD Radium Benchmark Dose Calculation Results
Attachment 6	RESRAD Single Radionuclide Guideline Level Calculation Results
Attachment 7	Cover Thickness Calculation Results for Target Maximum Risk of $3x10^{-4}$

ATTACHMENT 1

ESI SOIL STOCKPILE SAMPLE RESULTS – SVOCS, METALS, AND PCBS

Table 4-2
ESI Soil Stockpile Sample Results SVOCs, Metals, and PCBs
Fansteel Metals/FMRI
EPA Region 6

Analyte	SCDM Benchmark (lowest value)	Backgroud (SED-BKG) or RL	CAS.NO	Units	Station Sample ID Date Type	P8 SED-P8-20190408 4/8/2019 Field Sample		P8 SED-DUP1-20190408 4/8/2019 Field Duplicate		P9 SED-P9-20190408 4/8/2019 Field Sample		SS SS-STP-20190408 4/8/2019 Field Sample		SS SS-DUP1-20190408 4/8/2019 Field Duplicate	
SVOC															
1,1Â´-Biphenyl	-	8.1	92-52-4	ug/kg	--	9.5	U	9.8	U	9.2	U	**4**	JQ	1.9	U
2,3,4,6-Tetrachlorophenol	-	8.1	58-90-2	ug/kg	--	16	U	17	U	16	U	3.3	U	3.3	U
2,4,6-Trichlorophenol		8.1	88-06-2	ug/kg	--	9.5	U	9.8	U	9.2	U	1.9	U	1.9	U
2,4-Dichlorophenol	4000	8.1	120-83-2	ug/kg	--	7.3	U	7.5	U	7	U	1.5	U	1.5	U
2-Methylnaphthalene	6000	8.1	91-57-6	ug/kg	--	2.8	U	2.9	U	**19**		**8.1**		0.57	U
3&4-Methylphenol	100000	8.1	3/4-CRESOL	ug/kg	--	5.6	U	5.8	U	5.4	U	1.1	U	1.1	U
Acenaphthene	90000	4.1	83-32-9	ug/kg	--	2.8	U	2.9	U	2.7	U	**50**	JK	0.57	UJK
Anthracene	400000	4.1	120-12-7	ug/kg	--	**3**	JQ	**7.2**	JQ	2.7	U	**130**	JK	**1.8**	JQK
Benz(a)anthracene	40	4.1	56-55-3	ug/kg	--	**13**	JQ	9.3	U	8.7	U	**330**	JK	**7**	JK
Benzaldehyde	-	8.1	100-52-7	ug/kg	--	**38**	n	6.9	U	6.5	U	1.4	U	1.4	U
Benzo(a)pyrene	4	4.1	50-32-8	ug/kg	--	**13**	JQ	**8.2**	JQ	**14**	JQ	**280**	JK	**7.6**	JK
Benzo(b)fluoranthene	-	4.1	205-99-2	ug/kg	--	**18**	JQ	**18**	JQ	6.5	U	**360**	JK	**11**	JK
Benzo(g,h,i)perylene	-	4.1	191-24-2	ug/kg	--	3.9	U	4.1	U	3.8	U	**170**	JK	**5.2**	JK
Benzo(k)fluoranthene	400	4.1	207-08-9	ug/kg	--	**14**	JQ	**6.4**	JQ	**12**	JQ	**160**	JK	**6.7**	JK
Bis(2-ethylhexyl)phthalate	290	8.1	117-81-7	ug/kg	--	**19**	JQ	**12**	JQ	**39**		**8.4**		**3.5**	JQ
Butyl benzyl phthalate	2100	8.1	85-68-7	ug/kg	--	7.3	U	7.5	U	7	U	1.5	U	1.5	U
Carbazole	-	8.1	86-74-8	ug/kg	--	6.7	U	6.9	U	6.5	U	**110**	JK	1.4	U
Chrysene	4000	4.1	218-01-9	ug/kg	--	**19**		**12**	JQ	4.3	U	**370**	JK	**10**	JK
Dibenz(a,h)anthracene	4	4.1	53-70-3	ug/kg	--	9	U	9.3	U	8.7	U	**84**	JK	1.8	U
Dibenzofuran	1000	4.1	132-64-9	ug/kg	--	3.9	U	**6.9**	JQ	3.8	U	**34**	JK	0.8	U
Di-n-butyl phthalate	100000	8.1	84-74-2	ug/kg	--	6.7	U	6.9	U	6.5	U	**3.9**	JQ	**6.4**	JQ
Fluoranthene	60000	4.1	206-44-0	ug/kg	--	**35**		**21**		**16**	JQ	**720**	JK	**17**	JK
Fluorene	60000	4.1	86-73-7	ug/kg	--	6.2	U	**10**	JQ	6	U	**42**	JK	1.3	UJK
Indeno(1,2,3-cd)pyrene	400	4.1	193-39-5	ug/kg	--	**8.5**	JQ	4.6	U	4.3	U	**200**	JK	0.91	UJK
Naphthalene	30000	4.1	91-20-3	ug/kg	--	3.4	U	3.5	U	3.2	U	**11**		0.68	U
Pentachlorophenol	10	8.1	87-86-5	ug/kg	--	19	U	19	U	18	U	3.8	U	3.8	U
Phenanthrene	-	4.1	85-01-8	ug/kg	--	**23**		**49**		**18**	JQ	**620**	JK	**8.9**	JK
Pyrene	40000	4.1	129-00-0	ug/kg	--	**28**		**16**	JQ	**25**		**580**	JK	**17**	JK
PCBs															
Aroclor-1254	2	21	11097-69-1	ug/Kg-dry	--	19	U	20	U	19	U	5.4	UJK	**210**	JK
VOC															
Toluene	100,000	5	108-88-3	ug/Kg-dry	--	**6**	JQ	2.4	U	1.8	U	**1.7**	JQ	**1.5**	JQ

Table 4-2
ESI Soil Stockpile Sample Results SVOCs, Metals, and PCBs
Fansteel Metals/FMRI
EPA Region 6

Analyte	SCDM Benchmark (lowest value)	Backgroud (SED-BKG) or RL	CAS.NO	Units	Station Sample ID Date Type	P8 SED-P8-20190408 4/8/2019 Field Sample		P8 SED-DUP1-20190408 4/8/2019 Field Duplicate		P9 SED-P9-20190408 4/8/2019 Field Sample		SS SS-STP-20190408 4/8/2019 Field Sample		SS SS-DUP1-20190408 4/8/2019 Field Duplicate	
Metals															
Aluminum		7390	7429-90-5	mg/Kg-dry	--	26300		31200		37800		21800		22300	
Antimony		0.605	7440-36-0	mg/Kg-dry	--	0.686	JQL	0.908	JQL	1.13	JQL	0.372	JQL	0.484	JQL
Arsenic	0.0027	0.865	7440-38-2	mg/Kg-dry	--	19		19.6		21.3		6.06		6.38	
Barium	300	23.4	7440-39-3	mg/Kg-dry	--	125		156		133		690	JK	401	JK
Beryllium	3	0.605	7440-41-7	mg/Kg-dry	--	8.87		10.4		13.8		0.927		0.979	
Cadmium	0.7	0.605	7440-43-9	mg/Kg-dry	--	1.64		1.85		2.78		0.277	JQL	0.324	JQ
Calcium	-	568	7440-70-2	mg/Kg-dry	--	259000	JL	261000	JL	258000	JL	7040	JL	8640	JL
Chromium	0.0083	2.69	7440-47-3	mg/Kg-dry	--	299	JL	352	JL	1080	JL	66.8	JK	39.2	JK
Cobalt	0.4	0.904	7440-48-4	mg/Kg-dry	--	9.8		11.7		19		5.14		4.91	
Copper	60	0.548	7440-50-8	mg/Kg-dry	--	12.7		14.1		19		12		11	
Iron	1000	2230	7439-89-6	mg/Kg-dry	--	16000		22500		32200		16700		12600	
Lead	-	1.79	7439-92-1	mg/Kg-dry	--	9.96		12.1		10.5		113		116	
Magnesium	-	235	7439-95-4	mg/Kg-dry	--	7590		6500		4890		2410		2250	
Manganese	210	44.2	7439-96-5	mg/Kg-dry	--	7660		9070		15000		390		326	
Nickel	30	6.3	7440-02-0	mg/Kg-dry	--	47.1	JL	46.5	JL	73.1	JL	24.4	JL	19.3	JL
Potassium	-	151	2023695	mg/Kg-dry	--	1580	JL	2120	JL	1310	JL	4420	JL	4480	JL
Selenium	7	0.167	7782-49-2	mg/Kg-dry	--	4.9		5.31		5.21		4.93		5.42	
Silver	7	0.605	7440-22-4	mg/Kg-dry	--	2.7		3.09		5.05		1.58		2.23	
Sodium	-	96.8	7440-23-5	mg/Kg-dry	--	1200		1460		1190		1030		1480	
Zinc	400	4.21	7440-66-6	mg/Kg-dry	--	108	JK	194	JK	153	JL	52	JL	39.4	JL
Mercury	240	0.974	7439-97-6	ug/Kg-dry	--	41.6		75.8		47		199		181	
Cyanide- Total	0.9	2.45	57-12-5	mg/Kg-dry	--	1.24	JQ	1.18	J	0.93	JQ	0.326	U	0.314	U
RAD*															
Ra-226	3,950	0.7	13982-63-3	pCi/g	--	12		13.1		28		88.1		81.5	
Ra-228	1,420	0.92	15262-20-1	pCi/g	--	12.7		12.4		25.7		18		15.2	
Th-228	4,820	0.98	14274-82-9	pCi/g	--	13.1		13.9		26.3		16.1		18.5	
Th-230	17,100	0.56	14269-63-7	pCi/g	--	15.7		17		29.4		63		72	
Th-232	15,300	1.05	7440-29-1	pCi/g	--	13.4		14.1		23.6		15.8		18.6	
U-234	21,300	0.49	13966-29-5	pCi/g	--	75		93		267	JL	42.7		47.3	
U-235	20,800	0.026	15117-96-1	pCi/g	--	3.65		4.2		12.2	JL	2.48		2.69	
U-238	16,800	0.52	7440-61-1	pCi/g	--	78		94		279	JL	44.5		48.7	

Note:
ug/L - microgram per liter, mg/L - milligram per liter ,
pCi/g - picocurie per gram

Highlighted yellow - Above 3x Background or R

Highlighted orange - above lowest SCDM benchmark

U - Analyzed but not detected

J - Analyte detected below Quantitation Limit

H - Biased high

L - Biased low

K - Unknown bias

Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

* Rad results compared to 3x background or RL, not 2 standard deviations above the mean

ATTACHMENT 2
URANIUM AND THORIUM DECAY CHAINS

Natural Decay Series:
Uranium, Radium, and Thorium

Uranium, radium, and thorium occur in three natural decay series, headed by uranium-238, thorium-232, and uranium-235, respectively. In nature, the radionuclides in these three series are approximately in a state of secular equilibrium, in which the activities of all radionuclides within each series are nearly equal.

Two conditions are necessary for secular equilibrium. First, the parent radionuclide must have a half-life much longer than that of any other radionuclide in the series. Second, a sufficiently long period of time must have elapsed, for example ten half-lives of the decay product having the longest half-life, to allow for ingrowth of the decay products *(see the companion fact sheet on Ionizing Radiation).* Under secular equilibrium, the activity of the parent radionuclide undergoes no appreciable changes during many half-lives of its decay products.

The radionuclides of the uranium-238, thorium-232, and uranium-235 decay series are shown in Figures N.1, N.2, and N.3, along with the major mode of radioactive decay for each. Radioactive decay occurs when an unstable (radioactive) isotope transforms to a more stable isotope, generally by emitting a subatomic particle such as an alpha or beta particle. Radionuclides that give rise to alpha and beta particles are shown in these figures, as are those that emit significant gamma radiation.

Gamma radiation is not a mode of radioactive decay (such as alpha and beta decay). Rather, it is a mechanism by which excess energy is emitted from certain radionuclides, i.e., as highly energetic electromagnetic radiation emitted from the nucleus of the atom. For simplicity, only significant gamma emissions associated with the major decay modes are shown in Figures N.1 through N.3; that is, radionuclides listed are those for which the radiation dose associated with gamma rays may pose a health concern. The gamma component is not shown for those radionuclides whose gamma emissions do not generally represent a concern.

Of the two conditions noted above for secular equilibrium, the first is generally met for the uranium-238, thorium-232 and uranium-235 decay series in naturally occurring ores. While the second condition may not be met for all ores or other deposits of uranium and thorium (given the extremely long half-lives for the radionuclides involved and the geological changes that occur over similar time scales), it is reasonable to assume secular equilibrium for naturally occurring ores to estimate the concentrations of the various daughter radionuclides that accompany the parent. The state of secular equilibrium in natural uranium and thorium ores is significantly altered when they are processed to extract specific radionuclides.

After processing, radionuclides with half-lives less than one year will reestablish equilibrium conditions with their longer-lived parent radionuclides within several years. For this reason, at processing sites what was once a single, long decay series (for example the series for uranium-238) may be present as several smaller decay series headed by the longer-lived decay products of the original series (that is, headed by uranium-238, uranium-234, thorium-230, radium-226, and lead-210 in the case of uranium-238). Each of these sub-series can be considered to represent a new, separate decay series. Understanding the physical and chemical processes associated with materials containing uranium, thorium, and radium is important when addressing associated radiological risks.

In the fact sheets developed for uranium, radium, and thorium, the contributions of radionuclides having half-lives less than one year were included in the risk coefficients. (Each fact sheet identifies which radionuclides are included in these coefficients.) In some situations, it may be necessary to add the radiological risk identified for a given radionuclide to that of its parent radionuclide to properly represent the total risk. For example, the radiological risk for thorium-232 is comprised of the risk for thorium-232 plus the risk for radium-228. Decay series information should be used together with the information in these fact sheets to ensure that the radiological risks associated with uranium, radium, and thorium are properly estimated and represented.

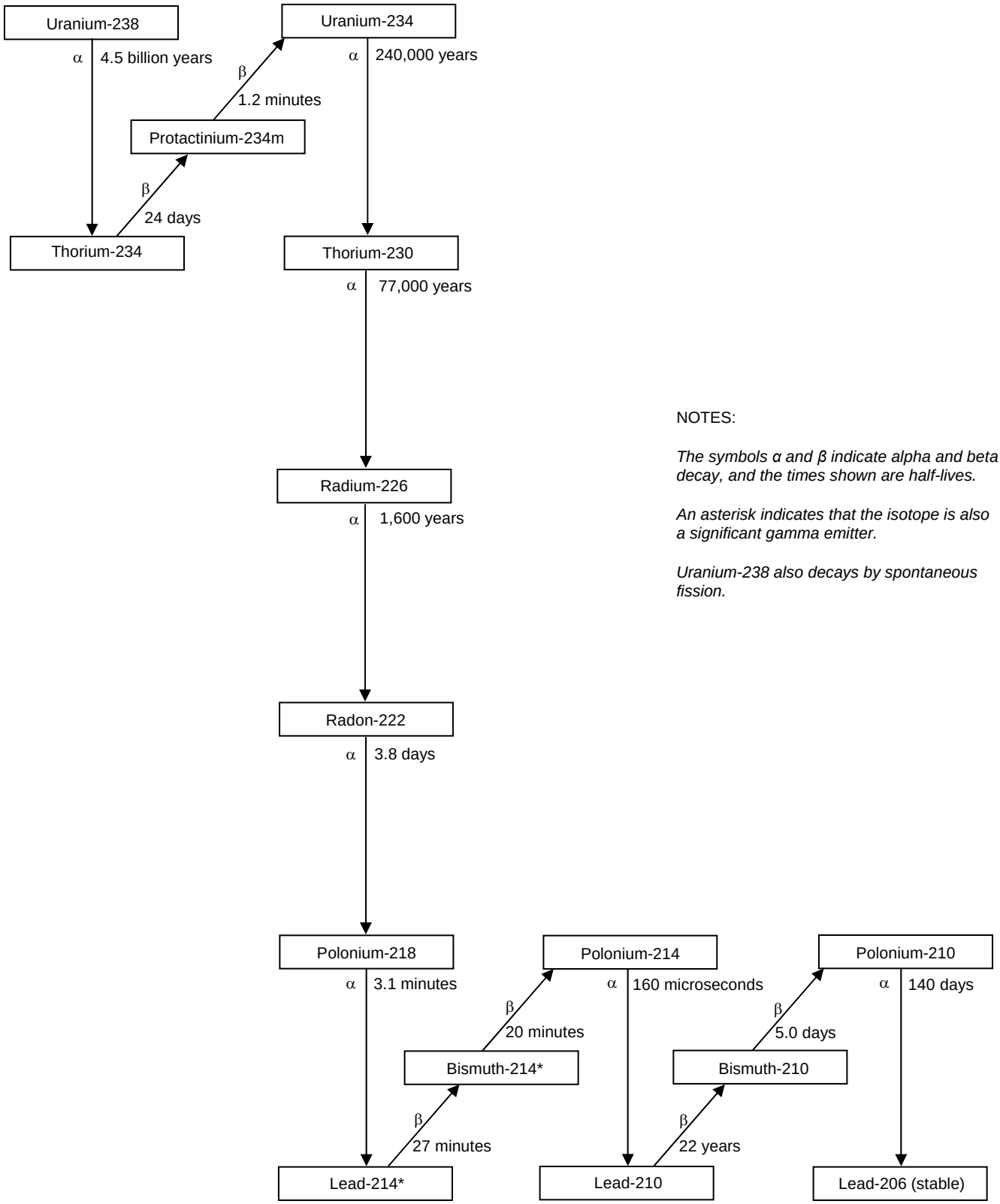
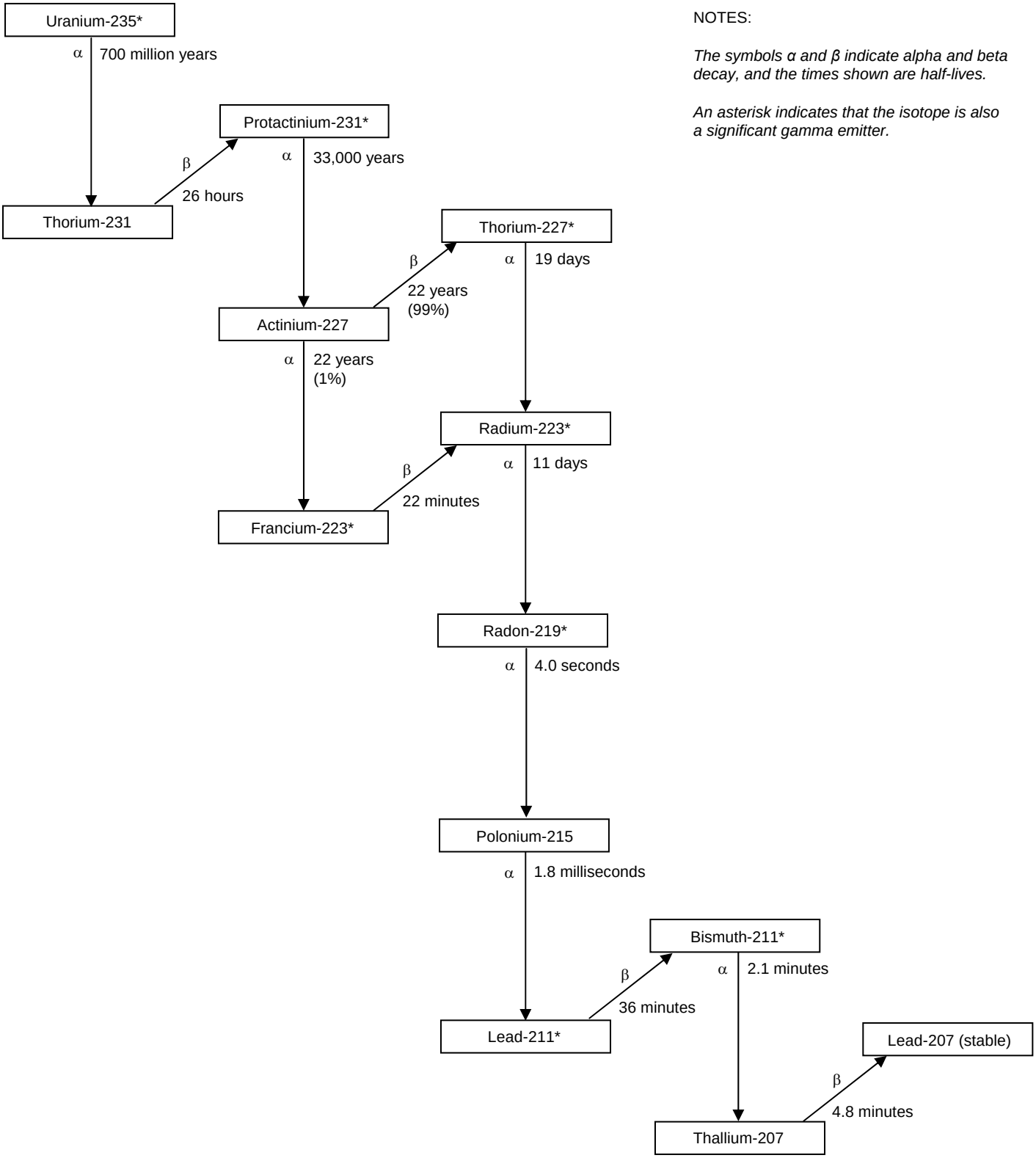


FIGURE N.1 Natural Decay Series: Uranium-238

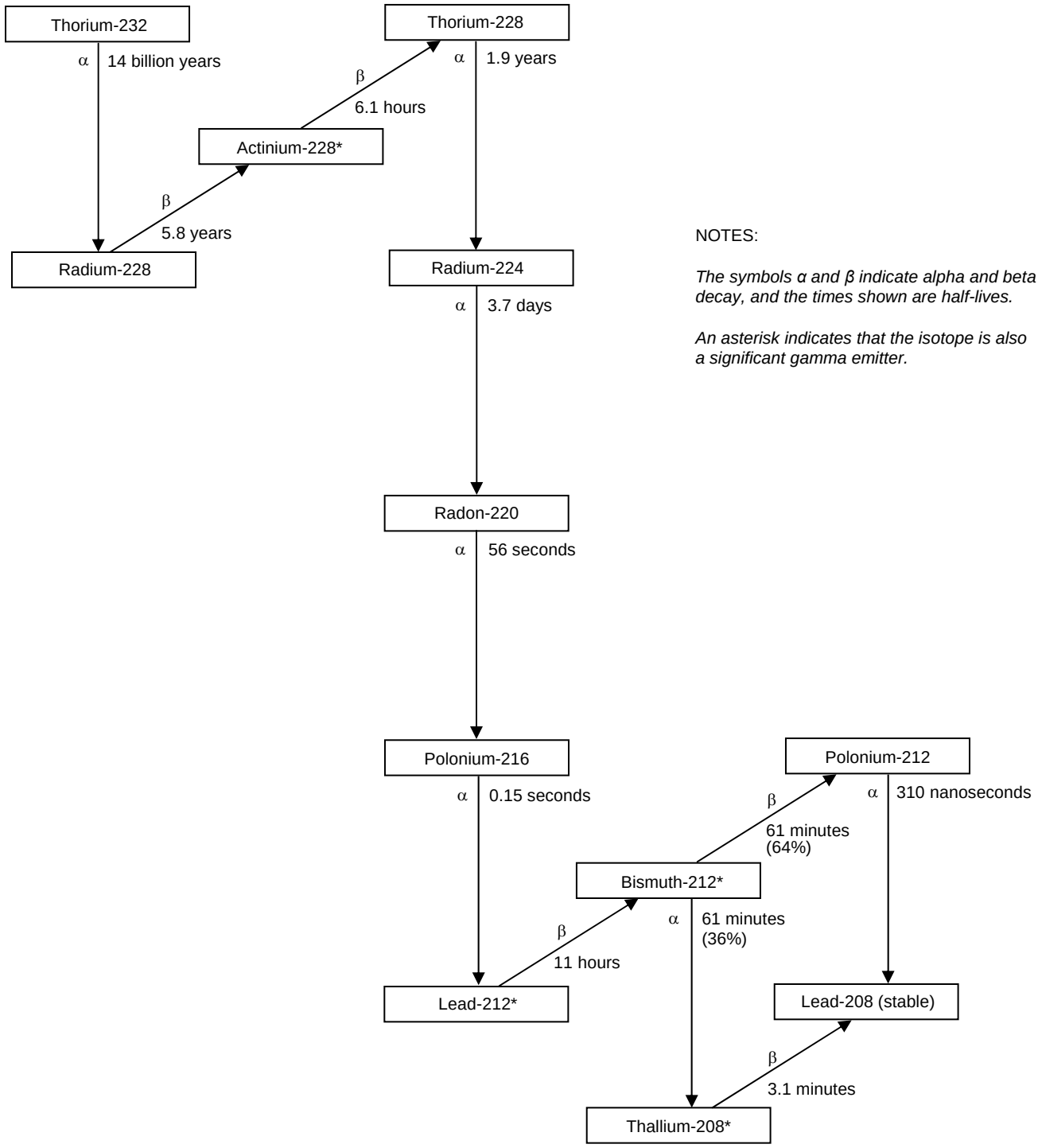


NOTES:

The symbols α and β indicate alpha and beta decay, and the times shown are half-lives.

An asterisk indicates that the isotope is also a significant gamma emitter.

FIGURE N.2 Natural Decay Series: Uranium-235



NOTES:

The symbols α and β indicate alpha and beta decay, and the times shown are half-lives.

An asterisk indicates that the isotope is also a significant gamma emitter.

FIGURE N.3 Natural Decay Series: Thorium-232

ATTACHMENT 3
PRG CALCULATOR RISK CALCULATION RESULTS

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	0 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000029 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)
Secular Equilibrium PRG for U-238	*7.06E-01*	*8.35E+01*	*2.71E-02*	*2.61E-02*

Site-specific
Outdoor Worker Individual Contribution PRGs for Soil - Secular Equilibrium

Isotope	Parent	Fractional Contribution of Progeny	ICRP Lung Absorption Type	Inhalation Slope Factor (risk/pCi)	External Exposure Slope Factor (risk/yr per pCi/g)	Adult Soil Ingestion Slope Factor (risk/pCi)	Lambda (1/yr)	Halflife (yr)
Secular Equilibrium PRG for U-238	***U-238***	**-**		**-**	**-**	**-**	**-**	**-**
At-218	U-238	2.00E-04	-	0.00E+00	2.74E-11	0.00E+00	1.46E+07	4.76E-08
Bi-210	U-238	1.00E+00	S	4.55E-10	2.77E-09	3.74E-12	5.05E+01	1.37E-02
Bi-214	U-238	1.00E+00	S	6.18E-11	7.34E-06	1.47E-13	1.83E+04	3.79E-05
Hg-206	U-238	1.90E-08	-	0.00E+00	4.83E-07	0.00E+00	4.47E+04	1.55E-05
Pa-234	U-238	1.60E-03	S	1.20E-12	6.62E-06	9.66E-13	9.06E+02	7.65E-04
Pa-234m	U-238	1.00E+00	-	0.00E+00	9.06E-08	0.00E+00	3.11E+05	2.23E-06
Pb-210	U-238	1.00E+00	S	1.59E-08	1.48E-09	5.99E-10	3.12E-02	2.22E+01
Pb-214	U-238	1.00E+00	S	7.77E-11	9.94E-07	2.21E-13	1.36E+04	5.10E-05
Po-210	U-238	1.00E+00	S	1.45E-08	4.51E-11	1.44E-09	1.83E+00	3.79E-01
Po-214	U-238	1.00E+00	-	0.00E+00	3.85E-10	0.00E+00	1.33E+11	5.21E-12
Po-218	U-238	1.00E+00	-	1.39E-11	6.84E-15	0.00E+00	1.17E+05	5.90E-06
Ra-226	U-238	1.00E+00	S	2.82E-08	2.50E-08	2.95E-10	4.33E-04	1.60E+03
Rn-218	U-238	2.00E-07	-	0.00E+00	3.39E-09	0.00E+00	6.24E+08	1.11E-09
Rn-222	U-238	1.00E+00	-	2.28E-12	1.69E-09	0.00E+00	6.62E+01	1.05E-02
Th-230	U-238	1.00E+00	F	3.41E-08	8.45E-10	7.73E-11	9.19E-06	7.54E+04
Th-234	U-238	1.00E+00	S	3.08E-11	1.77E-08	9.51E-12	1.05E+01	6.60E-02
Tl-206	U-238	1.34E-06	-	0.00E+00	6.11E-09	0.00E+00	8.67E+04	7.99E-06
Tl-210	U-238	2.10E-04	-	0.00E+00	1.34E-05	0.00E+00	2.80E+05	2.47E-06
U-234	U-238	1.00E+00	S	2.78E-08	2.53E-10	5.11E-11	2.82E-06	2.46E+05
U-238	U-238	1.00E+00	S	2.36E-08	1.24E-10	4.66E-11	1.55E-10	4.47E+09

Site-specific
Outdoor Worker Individual Contribution PRGs for Soil - Secular Equilibrium

Isotope	2000 m² Soil Volume Area Correction Factor	0 cm Soil Volume Gamma Shielding Factor	Particulate Emission Factor (m³/kg)	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (mg/kg)
Secular Equilibrium PRG for U-238	**-**	**-**	**-**	***7.06E-01***	***8.35E+01***	***2.71E-02***	***2.61E-02***	**-**
At-218	9.00E-01	1.00E+00	1.36E+09	-	-	3.94E+07	**3.94E+07**	7.37E-25
Bi-210	8.04E-01	1.00E+00	1.36E+09	4.76E+02	2.66E+04	8.75E+01	**7.37E+01**	1.10E-13
Bi-214	8.49E-01	1.00E+00	1.36E+09	1.21E+04	1.96E+05	3.12E-02	**3.12E-02**	7.26E-13
Hg-206	8.20E-01	1.00E+00	1.36E+09	-	-	2.59E+07	**2.59E+07**	3.46E-22
Pa-234	8.55E-01	1.00E+00	1.36E+09	1.15E+06	6.30E+09	2.15E+01	**2.15E+01**	2.33E-14
Pa-234m	8.71E-01	1.00E+00	1.36E+09	-	-	2.47E+00	**2.47E+00**	5.91E-16
Pb-210	9.05E-01	1.00E+00	1.36E+09	2.97E+00	7.61E+02	1.45E+02	**2.90E+00**	4.51E-09
Pb-214	8.34E-01	1.00E+00	1.36E+09	8.06E+03	1.56E+05	2.35E-01	**2.35E-01**	1.30E-13
Po-210	8.70E-01	1.00E+00	1.36E+09	1.24E+00	8.33E+02	4.96E+03	**1.24E+00**	1.80E-10
Po-214	8.69E-01	1.00E+00	1.36E+09	-	-	5.82E+02	**5.82E+02**	5.37E-24
Po-218	9.00E-01	1.00E+00	1.36E+09	-	8.69E+05	3.16E+07	**8.46E+05**	4.26E-21
Ra-226	7.27E-01	1.00E+00	1.36E+09	6.04E+00	4.29E+02	1.07E+01	**3.83E+00**	2.65E-07
Rn-218	8.38E-01	1.00E+00	1.36E+09	-	-	3.43E+08	**3.43E+08**	1.97E-27
Rn-222	8.58E-01	1.00E+00	1.36E+09	-	5.30E+06	1.34E+02	**1.34E+02**	4.86E-14
Th-230	9.62E-01	1.00E+00	1.36E+09	2.30E+01	3.55E+02	2.39E+02	**1.98E+01**	2.45E-06
Th-234	8.04E-01	1.00E+00	1.36E+09	1.87E+02	3.93E+05	1.36E+01	**1.27E+01**	3.40E-12
Tl-206	8.23E-01	1.00E+00	1.36E+09	-	-	2.89E+07	**2.89E+07**	1.59E-22
Tl-210	8.54E-01	1.00E+00	1.36E+09	-	-	8.09E+01	**8.09E+01**	1.80E-17
U-234	1.00E+00	1.00E+00	1.36E+09	3.48E+01	4.34E+02	7.68E+02	**3.09E+01**	5.20E-06
U-238	1.00E+00	1.00E+00	1.36E+09	3.81E+01	5.11E+02	1.57E+03	**3.47E+01**	8.58E-02

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for U-238	***6.90E-05***	***5.83E-07***	***1.80E-03***	***1.87E-03***
*Total Risk	6.90E-05	5.83E-07	1.80E-03	**1.87E-03**

Site-specific
Outdoor Worker Individual Risk Contributions for Soil - Secular Equilibrium

Isotope	ICRP Lung Absorption Type	Inhalation Slope Factor (risk/pCi)	External Exposure Slope Factor (risk/yr per pCi/g)	Adult Soil Ingestion Slope Factor (risk/pCi)	Lambda (1/yr)	Halflife (yr)	2000 m ^{2} Soil Volume Area Correction Factor	0 cm Soil Volume Gamma Shielding Factor
**Secular Equilibrium Risk for U-238*		-	-	-	-	-	-	-
At-218	-	0.00E+00	2.74E-11	0.00E+00	1.46E+07	4.76E-08	9.00E-01	1.00E+00
Bi-210	S	4.55E-10	2.77E-09	3.74E-12	5.05E+01	1.37E-02	8.04E-01	1.00E+00
Bi-214	S	6.18E-11	7.34E-06	1.47E-13	1.83E+04	3.79E-05	8.49E-01	1.00E+00
Hg-206	-	0.00E+00	4.83E-07	0.00E+00	4.47E+04	1.55E-05	8.20E-01	1.00E+00
Pa-234	S	1.20E-12	6.62E-06	9.66E-13	9.06E+02	7.65E-04	8.55E-01	1.00E+00
Pa-234m	-	0.00E+00	9.06E-08	0.00E+00	3.11E+05	2.23E-06	8.71E-01	1.00E+00
Pb-210	S	1.59E-08	1.48E-09	5.99E-10	3.12E-02	2.22E+01	9.05E-01	1.00E+00
Pb-214	S	7.77E-11	9.94E-07	2.21E-13	1.36E+04	5.10E-05	8.34E-01	1.00E+00
Po-210	S	1.45E-08	4.51E-11	1.44E-09	1.83E+00	3.79E-01	8.70E-01	1.00E+00
Po-214	-	0.00E+00	3.85E-10	0.00E+00	1.33E+11	5.21E-12	8.69E-01	1.00E+00
Po-218	-	1.39E-11	6.84E-15	0.00E+00	1.17E+05	5.90E-06	9.00E-01	1.00E+00
Ra-226	S	2.82E-08	2.50E-08	2.95E-10	4.33E-04	1.60E+03	7.27E-01	1.00E+00
Rn-218	-	0.00E+00	3.39E-09	0.00E+00	6.24E+08	1.11E-09	8.38E-01	1.00E+00
Rn-222	-	2.28E-12	1.69E-09	0.00E+00	6.62E+01	1.05E-02	8.58E-01	1.00E+00
Th-230	F	3.41E-08	8.45E-10	7.73E-11	9.19E-06	7.54E+04	9.62E-01	1.00E+00
Th-234	S	3.08E-11	1.77E-08	9.51E-12	1.05E+01	6.60E-02	8.04E-01	1.00E+00
Tl-206	-	0.00E+00	6.11E-09	0.00E+00	8.67E+04	7.99E-06	8.23E-01	1.00E+00
Tl-210	-	0.00E+00	1.34E-05	0.00E+00	2.80E+05	2.47E-06	8.54E-01	1.00E+00
U-234	S	2.78E-08	2.53E-10	5.11E-11	2.82E-06	2.46E+05	1.00E+00	1.00E+00
U-238	S	2.36E-08	1.24E-10	4.66E-11	1.55E-10	4.47E+09	1.00E+00	1.00E+00

Site-specific
Outdoor Worker Individual Risk Contributions for Soil - Secular Equilibrium

Isotope	Infinite Soil Volume Concentration (pCi/g)	Ingestion CDI (pCi)	Inhalation CDI (pCi)	External Exposure CDI (pCi)	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
**Secular Equilibrium Risk for U-238*	-	-	-	-	***6.90E-05***	***5.83E-07***	***1.80E-03***	***1.87E-03***
At-218	48.7	2.74E+04	4.03E+00	2.25E+02	0.00E+00	0.00E+00	1.24E-12	**1.24E-12**
Bi-210	48.7	2.74E+04	4.03E+00	2.01E+02	1.02E-07	1.83E-09	5.56E-07	**6.61E-07**
Bi-214	48.7	2.74E+04	4.03E+00	2.12E+02	4.03E-09	2.49E-10	1.56E-03	**1.56E-03**
Hg-206	48.7	2.74E+04	4.03E+00	2.05E+02	0.00E+00	0.00E+00	1.88E-12	**1.88E-12**
Pa-234	48.7	2.74E+04	4.03E+00	2.14E+02	4.23E-11	7.73E-15	2.27E-06	**2.27E-06**
Pa-234m	48.7	2.74E+04	4.03E+00	2.18E+02	0.00E+00	0.00E+00	1.97E-05	**1.97E-05**
Pb-210	48.7	2.74E+04	4.03E+00	2.26E+02	1.64E-05	6.40E-08	3.36E-07	**1.68E-05**
Pb-214	48.7	2.74E+04	4.03E+00	2.09E+02	6.04E-09	3.13E-10	2.07E-04	**2.07E-04**
Po-210	48.7	2.74E+04	4.03E+00	2.18E+02	3.93E-05	5.85E-08	9.81E-09	**3.94E-05**
Po-214	48.7	2.74E+04	4.03E+00	2.17E+02	0.00E+00	0.00E+00	8.37E-08	**8.37E-08**
Po-218	48.7	2.74E+04	4.03E+00	2.25E+02	0.00E+00	5.60E-11	1.54E-12	**5.76E-11**
Ra-226	48.7	2.74E+04	4.03E+00	1.82E+02	8.07E-06	1.13E-07	4.54E-06	**1.27E-05**
Rn-218	48.7	2.74E+04	4.03E+00	2.10E+02	0.00E+00	0.00E+00	1.42E-13	**1.42E-13**
Rn-222	48.7	2.74E+04	4.03E+00	2.15E+02	0.00E+00	9.19E-12	3.63E-07	**3.63E-07**
Th-230	48.7	2.74E+04	4.03E+00	2.41E+02	2.12E-06	1.37E-07	2.03E-07	**2.46E-06**
Th-234	48.7	2.74E+04	4.03E+00	2.01E+02	2.60E-07	1.24E-10	3.57E-06	**3.83E-06**
Tl-206	48.7	2.74E+04	4.03E+00	2.06E+02	0.00E+00	0.00E+00	1.68E-12	**1.68E-12**
Tl-210	48.7	2.74E+04	4.03E+00	2.14E+02	0.00E+00	0.00E+00	6.02E-07	**6.02E-07**
U-234	48.7	2.74E+04	4.03E+00	2.50E+02	1.40E-06	1.12E-07	6.34E-08	**1.57E-06**
U-238	48.7	2.74E+04	4.03E+00	2.50E+02	1.28E-06	9.53E-08	3.10E-08	**1.40E-06**

The total risk for just U-238 through Pa-234 = 2.27E-06 + 1.97E-05 + 3.83E-06 + 1.57E-06 + 1.40E-06 = 2.88E-05

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	0 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000029 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - No secular equilibrium, no progeny (with decay)

Isotope	ICRP Lung Absorption Type	Inhalation Slope Factor (risk/pCi)	External Exposure Slope Factor (risk/yr per pCi/g)	Adult Soil Ingestion Slope Factor (risk/pCi)	Lambda (1/yr)	Halflife (yr)	2000 m² Soil Volume Area Correction Factor	0 cm Soil Volume Gamma Shielding Factor	Particulate Emission Factor (m³/kg)	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (mg/kg)
Th-230	F	3.41E-08	8.45E-10	7.73E-11	9.19E-06	7.54E+04	9.62E-01	1.00E+00	1.36E+09	2.30E+01	3.55E+02	2.39E+02	**1.98E+01**	9.61E-04

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Site-specific
Outdoor Worker Risk for Soil - No secular equilibrium, no progeny (with decay)

Isotope	ICRP Lung Absorption Type	Inhalation Slope Factor (risk/pCi)	External Exposure Slope Factor (risk/yr per pCi/g)	Adult Soil Ingestion Slope Factor (risk/pCi)	Lambda (1/yr)	Halflife (yr)	2000 m ^{2} Soil Volume Area Correction Factor	0 cm Soil Volume Gamma Shielding Factor
Th-230	F	3.41E-08	8.45E-10	7.73E-11	9.19E-06	7.54E+04	9.62E-01	1.00E+00
*Total Risk		-	-	-	-	-	-	-

Isotope	Infinite Soil Volume Concentration (pCi/g)	Ingestion CDI (pCi)	Inhalation CDI (pCi)	External Exposure CDI (pCi)	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Th-230	72	4.05E+04	5.96E+00	3.56E+02	3.13E-06	2.03E-07	3.01E-07	**3.64E-06**
*Total Risk	-	-	-	-	3.13E-06	2.03E-07	3.01E-07	**3.64E-06**

The total risk for Th-230 = 3.64E-06

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	0 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000029 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*2.75E-02*	*2.65E-02*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***1.16E-04***	***4.31E-07***	***3.21E-03***	***3.32E-03***
*Total Risk	1.16E-04	4.31E-07	3.21E-03	**3.32E-03**

The total risk for Ra-226 through Pb-210 = 3.23E-03

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	0 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000029 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)
Secular Equilibrium PRG for Th-232	*1.94E+00*	*5.22E+01*	*1.97E-02*	*1.95E-02*
Secular Equilibrium PRG for U-235	*3.23E+00*	*3.84E+01*	*1.05E-01*	*1.01E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
**Secular Equilibrium Risk for Th-232*	***9.60E-06***	***3.56E-07***	***9.45E-04***	***9.55E-04***
**Secular Equilibrium Risk for U-235*	***8.32E-07***	***7.00E-08***	***2.57E-05***	***2.66E-05***
*Total Risk	1.04E-05	4.26E-07	9.71E-04	**9.82E-04**

The total risk for the full U-235 decay chain = 2.66E-05. The total risk for the Th-232 decay chain = 9.55E-04.

The total risk for the full U-238, U-235, and Th-232 decay chains is thus:
2.88E-05 +
3.64E-06 +
3.23E-03 +
2.66E-05 +
9.55E-04 = 4.33E-03

ATTACHMENT 4
COVER THICKNESS CALCULATION RESULTS FOR RADON FLUX

Attachment 4
Cover Thickness Calculation Results for Radon Flux
Fansteel Metals/ FMRI
Muskogee, Muskogee County, Oklahoma

	Type of Material	[1]Thickness of Layer (cm) (x)	[2]Porosity of Material (Unitless) (n)	[3]Density of Material (g/cm^3) (ρ)	[3]Radon Emanation Coefficient (Unitless) (E)	[3]Radon Decay Constant (1/s) (λ)	[3]Long-term Average Moisture Content (Dry weight percentage) (w)	[3]Specific Gravity of Soils (Unitless) (G)
Contaminated Soils	Native soil	130	0.305660377	1.84	0.35	2.10E-06	10	2.65
Cover layer	Native soil	23	0.305660377	1.84	0.35	2.10E-06	10	2.65
	Specific Activity of Ra-226 (pCi/g) (R)	[2]Moisture saturation fractions (Unitless) (m)	[2]Radon Diffusion Coefficients (cm^2/s) (D)	[2]Inverse relaxation length (1/cm) (b)	[2]Interface constants (cm^2/s) (a)	[3]Equilibrium distrubution Coffecient of Radon in Water and Air (pCi/cm^3) (k)	[2]Radon Flux from the bare contaminated soil (pCi/m^2-s) (J_t)	[2]Radon Flux from the Cover (pCi/m^2-s) (J_c)
Contaminated Soils	44	0.6020	5.75E-03	0.0191	0.0002	0.2600	31	
Cover Layer	0.5	0.6020	5.75E-03	0.0191	0.0002	0.2600	0.1	**19.9**
							NRC Radon Flux Limit:	20

[1]Thickness of cover layer was determined by trial and error in order to determine the maximum thickness with a Radon Flux result less than or equal to the NRC limit of 20 pCi/m2-s. A cover thickness of 23 centimeters is equivalent to approximately 0.75 feet. The contaminated soil thickness of 130 centimeters = 51 inches = 4.25 feet. The radon flux calculated result remains the same (19.9 pCi/m^2-s) beyond a thickness of 130 centimeters.

[2]Value calculated per NRC Regulatory Guide 3.64 formulas noted below. The NRC Regulatory Guide 3.64 formulas were designed with uranium mill tailings in mind; therefore, the subscripts 't' and 'c' in the formulas below refer to 'tailings' and 'cover', respectively. In this case, the formulas and terms with the 't' subscript are used for 'Contaminated Soils' and the formulas and terms with the 'c' subscript are used for 'Cover layer'.

[3]Value obtained from NRC Regulatory Guide 3.64.

NRC Regulatory Guide 3.64 Radon Flux Formulas:

$$J_t = \quad = 10^4 * R * \rho * E * \sqrt{(\lambda * D)} * \text{hyperbolic tangent of } (x * \sqrt{(\lambda/D)})$$

$$J_c = \frac{2 * J_t * e^{-b_c * x_c}}{1 + \sqrt{(a_t/a_c)}}$$

$$D = 0.07 * e^{-4 * (m - (m * n^2) + (m^5))}$$

$$m = \frac{10^{-2} * \rho * w}{n * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm3

$$n = 1 - \frac{\rho}{G * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm^3

$$b = \sqrt{(\lambda/D)}$$

$$a = n^2 * D * (1-((1-k) * m))^2$$

Attachment 4 (Continued)
Cover Thickness Calculation Results for Radon Flux
Fansteel Metals/ FMRI
Muskogee, Muskogee County, Oklahoma

	Type of Material	[1]Thickness of Layer (cm) (x)	[2]Porosity of Material (Unitless) (n)	[3]Density of Material (g/cm^3) (ρ)	[3]Radon Emanation Coefficient (Unitless) (E)	[3]Radon Decay Constant (1/s) (λ)	[3]Long-term Average Moisture Content (Dry weight percentage) (w)	[3]Specific Gravity of Soils (Unitless) (G)
Contaminated Soils	Native soil	130	0.305660377	1.84	0.35	2.10E-06	10	2.65
Cover layer	Native soil	40	0.305660377	1.84	0.35	2.10E-06	10	2.65
	Specific Activity of Ra-226 (pCi/g) (R)	[2]Moisture saturation fractions (Unitless) (m)	[2]Radon Diffusion Coefficients (cm^2/s) (D)	[2]Inverse relaxation length (1/cm) (b)	[2]Interface constants (cm^2/s) (a)	[3]Equilibrium distrubution Coffecient of Radon in Water and Air (pCi/cm^3) (k)	[2]Radon Flux from the bare contaminated soil (pCi/m^2-s) (J_t)	[2]Radon Flux from the Cover (pCi/m^2-s) (J_c)
Contaminated Soils	60	0.6020	5.75E-03	0.0191	0.0002	0.2600	42	
Cover Layer	0.5	0.6020	5.75E-03	0.0191	0.0002	0.2600	0.2	**19.7**
							NRC Radon Flux Limit:	20

[1]Thickness of cover layer was determined by trial and error in order to determine the maximum thickness with a Radon Flux result less than or equal to the NRC limit of 20 pCi/m2-s. A cover thickness of 40 centimeters is equivalent to 1.31 feet. The contaminated soil thickness of 130 centimeters = 51 inches = 4.25 feet. The radon flux calculated result remains the same (19.7 pCi/m^2-s) beyond a thickness of 130 centimeters.

[2]Value calculated per NRC Regulatory Guide 3.64 formulas noted below. The NRC Regulatory Guide 3.64 formulas were designed with uranium mill tailings in mind; therefore, the subscripts 't' and 'c' in the formulas below refer to 'tailings' and 'cover', respectively. In this case, the formulas and terms with the 't' subscript are used for 'Contaminated Soils' and the formulas and terms with the 'c' subscript are used for 'Cover layer'.

[3]Value obtained from NRC Regulatory Guide 3.64.

NRC Regulatory Guide 3.64 Radon Flux Formulas:

$$J_t = \quad = 10^4 * R * \rho * E * \sqrt{(\lambda * D)} * \text{hyperbolic tangent of } (x * \sqrt{(\lambda/D)})$$

$$J_c = \frac{2 * J_t * e^{-b_c * x_c}}{1 + \sqrt{(a_t/a_c)}}$$

$$D = 0.07 * e^{-4 * (m - (m * n^2) + (m^5))}$$

$$m = \frac{10^{-2} * \rho * w}{n * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm3

$$n = 1 - \frac{\rho}{G * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm^3

$$b = \sqrt{(\lambda/D)}$$

$$a = n^2 * D * (1-((1-k) * m))^2$$

Attachment 4 (Continued)
Cover Thickness Calculation Results for Radon Flux
Fansteel Metals/ FMRI
Muskogee, Muskogee County, Oklahoma

	Type of Material	[1]Thickness of Layer (cm) (x)	[2]Porosity of Material (Unitless) (n)	[3]Density of Material (g/cm^3) (ρ)	[3]Radon Emanation Coefficient (Unitless) (E)	[3]Radon Decay Constant (1/s) (λ)	[3]Long-term Average Moisture Content (Dry weight percentage) (w)	[3]Specific Gravity of Soils (Unitless) (G)
Contaminated Soils	Native soil	130	0.305660377	1.84	0.35	2.10E-06	10	2.65
Cover layer	Native soil	60	0.305660377	1.84	0.35	2.10E-06	10	2.65
	Specific Activity of Ra-226 (pCi/g) (R)	[2]Moisture saturation fractions (Unitless) (m)	[2]Radon Diffusion Coefficients (cm^2/s) (D)	[2]Inverse relaxation length (1/cm) (b)	[2]Interface constants (cm^2/s) (a)	[3]Equilibrium distrubution Coffecient of Radon in Water and Air (pCi/cm^3) (k)	[2]Radon Flux from the bare contaminated soil (pCi/m^2-s) (J_t)	[2]Radon Flux from the Cover (pCi/m^2-s) (J_c)
Contaminated Soils	88	0.6020	5.75E-03	0.0191	0.0002	0.2600	61	
Cover Layer	0.5	0.6020	5.75E-03	0.0191	0.0002	0.2600	0.3	**19.8**
							NRC Radon Flux Limit:	20

[1]Thickness of cover layer was determined by trial and error in order to determine the maximum thickness with a Radon Flux result less than or equal to the NRC limit of 20 pCi/m2-s. A cover thickness of 60 centimeters is equivalent to 23.6 inches or 2 feet. The contaminated soil thickness of 130 centimeters = 51 inches = 4.25 feet. The radon flux calculated result remains the same (19.8 pCi/m^2-s) beyond a thickness of 130 centimeters.

[2]Value calculated per NRC Regulatory Guide 3.64 formulas noted below. The NRC Regulatory Guide 3.64 formulas were designed with uranium mill tailings in mind; therefore, the subscripts 't' and 'c' in the formulas below refer to 'tailings' and 'cover', respectively. In this case, the formulas and terms with the 't' subscript are used for 'Contaminated Soils' and the formulas and terms with the 'c' subscript are used for 'Cover layer'.

[3]Value obtained from NRC Regulatory Guide 3.64.

NRC Regulatory Guide 3.64 Radon Flux Formulas:

$$J_t = \quad = 10^4 * R * \rho * E * \sqrt{(\lambda * D)} * \text{hyperbolic tangent of } (x * \sqrt{(\lambda/D)})$$

$$J_c = \frac{2 * J_t * e^{-b_c * x_c}}{1 + \sqrt{(a_t/a_c)}}$$

$$D = 0.07 * e^{-4 * (m - (m * n^2) + (m^5))}$$

$$m = \frac{10^{-2} * \rho * w}{n * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm3

$$n = 1 - \frac{\rho}{G * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm^3

$$b = \sqrt{(\lambda/D)}$$

$$a = n^2 * D * (1-((1-k) * m))^2$$

Attachment 4 (Continued)
Cover Thickness Calculation Results for Radon Flux
Fansteel Metals/ FMRI
Muskogee, Muskogee County, Oklahoma

	Type of Material	[1]Thickness of Layer (cm) (x)	[2]Porosity of Material (Unitless) (n)	[3]Density of Material (g/cm^3) (ρ)	[3]Radon Emanation Coefficient (Unitless) (E)	[3]Radon Decay Constant (1/s) (λ)	[3]Long-term Average Moisture Content (Dry weight percentage) (w)	[3]Specific Gravity of Soils (Unitless) (G)
Contaminated Soils	Native soil	130	0.305660377	1.84	0.35	2.10E-06	10	2.65
Cover layer	Native soil	67	0.305660377	1.84	0.35	2.10E-06	10	2.65
	Specific Activity of Ra-226 (pCi/g) (R)	[2]Moisture saturation fractions (Unitless) (m)	[2]Radon Diffusion Coefficients (cm^2/s) (D)	[2]Inverse relaxation length (1/cm) (b)	[2]Interface constants (cm^2/s) (a)	[3]Equilibrium distrubution Coffecient of Radon in Water and Air (pCi/cm^3) (k)	[2]Radon Flux from the bare contaminated soil (pCi/m^2-s) (J_t)	[2]Radon Flux from the Cover (pCi/m^2-s) (J_c)
Contaminated Soils	100	0.6020	5.75E-03	0.0191	0.0002	0.2600	70	
Cover Layer	0.5	0.6020	5.75E-03	0.0191	0.0002	0.2600	0.3	**19.7**
							NRC Radon Flux Limit:	20

[1]Thickness of cover layer was determined by trial and error in order to determine the maximum thickness with a Radon Flux result less than or equal to the NRC limit of 20 pCi/m2-s. A cover thickness of 67 centimeters is equivalent to approximately 2.20 feet. The contaminated soil thickness of 130 centimeters = 51 inches = 4.25 feet. The radon flux calculated result remains the same (19.7 pCi/m^2-s) beyond a thickness of 130 centimeters.

[2]Value calculated per NRC Regulatory Guide 3.64 formulas noted below. The NRC Regulatory Guide 3.64 formulas were designed with uranium mill tailings in mind; therefore, the subscripts 't' and 'c' in the formulas below refer to 'tailings' and 'cover', respectively. In this case, the formulas and terms with the 't' subscript are used for 'Contaminated Soils' and the formulas and terms with the 'c' subscript are used for 'Cover layer'.

[3]Value obtained from NRC Regulatory Guide 3.64.

NRC Regulatory Guide 3.64 Radon Flux Formulas:

$$J_t = \quad = 10^4 * R * \rho * E * \sqrt{(\lambda * D)} * \text{hyperbolic tangent of } (x * \sqrt{(\lambda/D)})$$

$$J_c = \frac{2 * J_t * e^{-b_c * x_c}}{1 + \sqrt{(a_t/a_c)}}$$

$$D = 0.07 * e^{-4 * (m - (m * n^2) + (m^5))}$$

$$m = \frac{10^{-2} * \rho * w}{n * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm3

$$n = 1 - \frac{\rho}{G * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm^3

$$b = \sqrt{(\lambda/D)}$$

$$a = n^2 * D * (1-((1-k) * m))^2$$

Attachment 4 (Continued)
Cover Thickness Calculation Results for Radon Flux
Fansteel Metals/ FMRI
Muskogee, Muskogee County, Oklahoma

	Type of Material	[1]Thickness of Layer (cm) (x)	[2]Porosity of Material (Unitless) (n)	[3]Density of Material (g/cm^3) (ρ)	[3]Radon Emanation Coefficient (Unitless) (E)	[3]Radon Decay Constant (1/s) (λ)	[3]Long-term Average Moisture Content (Dry weight percentage) (w)	[3]Specific Gravity of Soils (Unitless) (G)
Contaminated Soils	Native soil	130	0.305660377	1.84	0.35	2.10E-06	10	2.65
Cover layer	Native soil	78	0.305660377	1.84	0.35	2.10E-06	10	2.65
	Specific Activity of Ra-226 (pCi/g) (R)	[2]Moisture saturation fractions (Unitless) (m)	[2]Radon Diffusion Coefficients (cm^2/s) (D)	[2]Inverse relaxation length (1/cm) (b)	[2]Interface constants (cm^2/s) (a)	[3]Equilibrium distrubution Coffecient of Radon in Water and Air (pCi/cm^3) (k)	[2]Radon Flux from the bare contaminated soil (pCi/m^2-s) (J_t)	[2]Radon Flux from the Cover (pCi/m^2-s) (J_c)
Contaminated Soils	125	0.6020	5.75E-03	0.0191	0.0002	0.2600	87	
Cover Layer	0.5	0.6020	5.75E-03	0.0191	0.0002	0.2600	0.3	**20.0**
							NRC Radon Flux Limit:	20

[1]Thickness of cover layer was determined by trial and error in order to determine the maximum thickness with a Radon Flux result less than or equal to the NRC limit of 20 pCi/m2-s. A cover thickness of 78 centimeters is equivalent to 2 .56 feet. The contaminated soil thickness of 130 centimeters = 51 inches = 4.25 feet. The radon flux calculated result remains the same (20.0 pCi/m^2-s) beyond a thickness of 130 centimeters.

[2]Value calculated per NRC Regulatory Guide 3.64 formulas noted below. The NRC Regulatory Guide 3.64 formulas were designed with uranium mill tailings in mind; therefore, the subscripts 't' and 'c' in the formulas below refer to 'tailings' and 'cover', respectively. In this case, the formulas and terms with the 't' subscript are used for 'Contaminated Soils' and the formulas and terms with the 'c' subscript are used for 'Cover layer'.

[3]Value obtained from NRC Regulatory Guide 3.64.

NRC Regulatory Guide 3.64 Radon Flux Formulas:

$$J_t = \quad = 10^4 * R * \rho * E * \sqrt{(\lambda * D)} * \text{hyperbolic tangent of } (x * \sqrt{(\lambda/D)})$$

$$J_c = \frac{2 * J_t * e^{-b_c * x_c}}{1 + \sqrt{(a_t/a_c)}}$$

$$D = 0.07 * e^{-4 * (m - (m * n^2) + (m^5))}$$

$$m = \frac{10^{-2} * \rho * w}{n * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm3

$$n = 1 - \frac{\rho}{G * \rho_w}$$; ρ_w is the mass density of water = 1 g/cm^3

$$b = \sqrt{(\lambda/D)}$$

$$a = n^2 * D * (1-((1-k) * m))^2$$

ATTACHMENT 5
RESRAD RADIUM BENCHMARK DOSE CALCULATION RESULTS

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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	At-218 (Source: DCFPAK3.02)	5.567E-05	5.567E-05	DCF1(1)
A-1	Bi-210 (Source: DCFPAK3.02)	5.473E-03	5.473E-03	DCF1(2)
A-1	Bi-214 (Source: DCFPAK3.02)	9.135E+00	9.135E+00	DCF1(3)
A-1	Hg-206 (Source: DCFPAK3.02)	6.127E-01	6.127E-01	DCF1(4)
A-1	Pb-210 (Source: DCFPAK3.02)	2.092E-03	2.092E-03	DCF1(5)
A-1	Pb-214 (Source: DCFPAK3.02)	1.257E+00	1.257E+00	DCF1(6)
A-1	Po-210 (Source: DCFPAK3.02)	5.641E-05	5.641E-05	DCF1(7)
A-1	Po-214 (Source: DCFPAK3.02)	4.801E-04	4.801E-04	DCF1(8)
A-1	Po-218 (Source: DCFPAK3.02)	9.228E-09	9.228E-09	DCF1(9)
A-1	Ra-226 (Source: DCFPAK3.02)	3.176E-02	3.176E-02	DCF1(10)
A-1	Rn-218 (Source: DCFPAK3.02)	4.259E-03	4.259E-03	DCF1(11)
A-1	Rn-222 (Source: DCFPAK3.02)	2.130E-03	2.130E-03	DCF1(12)
A-1	Tl-206 (Source: DCFPAK3.02)	1.278E-02	1.278E-02	DCF1(13)
A-1	Tl-210 (Source: DCFPAK3.02)	1.677E+01	1.677E+01	DCF1(14)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.285E-02	2.231E-02	DCF2(1)
B-1	Pb-210+D1	2.284E-02	2.231E-02	DCF2(2)
B-1	Po-210	1.732E-02	1.732E-02	DCF2(3)
B-1	Ra-226+D	3.823E-02	3.811E-02	DCF2(4)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	3.781E-03	3.774E-03	DCF3(1)
D-1	Pb-210+D1	3.781E-03	3.774E-03	DCF3(2)
D-1	Po-210	6.475E-03	6.475E-03	DCF3(3)
D-1	Ra-226+D	1.677E-03	1.676E-03	DCF3(4)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Pb-210+D1 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pb-210+D1 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(2,2)
D-34	Pb-210+D1 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,3)
D-34				
D-34	Po-210 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Po-210 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(3,2)
D-34	Po-210 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.400E-04	3.400E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Pb-210+D1 , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Pb-210+D1 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Po-210 , fish	1.000E+02	1.000E+02	BIOFAC(3,1)
D-5	Po-210 , crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(3,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.000E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(4)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(4)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.165E-02	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.217E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Po-210				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.176E-01	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R017	Inhalation rate (m**3/yr)	1.350E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.055E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	2.250E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : RESRAD - Fansteel Site - Outdoor Worker - Radium Benchmark Dose

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	2000.00 square meters	Ra-226	5.000E+00
Thickness:	0.15 meters		
Cover Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	8.409E+00	8.130E+00	7.600E+00	5.992E+00	2.993E+00	2.025E-01	0.000E+00	0.000E+00
M(t):	3.363E-01	3.252E-01	3.040E-01	2.397E-01	1.197E-01	8.099E-03	0.000E+00	0.000E+00

Maximum TDOSE(t): 8.409E+00 mrem/yr at t = 0.000E+00 years

Radium Benchmark Dose

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	8.361E+00	0.9943	7.547E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.025E-02	0.0048
Total	8.361E+00	0.9943	7.547E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.025E-02	0.0048

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.409E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.409E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	8.078E+00	0.9936	7.464E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.445E-02	0.0055
Total	8.078E+00	0.9936	7.464E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.445E-02	0.0055

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.130E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.130E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	7.540E+00	0.9921	7.302E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.264E-02	0.0069
Total	7.540E+00	0.9921	7.302E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.264E-02	0.0069

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.600E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.600E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	5.917E+00	0.9875	6.519E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.817E-02	0.0114
Total	5.917E+00	0.9875	6.519E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.817E-02	0.0114

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.992E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.992E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	2.931E+00	0.9793	3.877E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.810E-02	0.0194
Total	2.931E+00	0.9793	3.877E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.810E-02	0.0194

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.993E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.993E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	1.979E-01	0.9776	2.300E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.297E-03	0.0212
Total	1.979E-01	0.9776	2.300E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.297E-03	0.0212

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E-01	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226+D	Ra-226+D	1.000E+00	1.681E+00	1.624E+00	1.516E+00	1.189E+00	5.886E-01	3.964E-02	0.000E+00	0.000E+00
Ra-226+D	Pb-210+D	1.000E+00	3.002E-04	8.624E-04	1.827E-03	3.894E-03	4.238E-03	3.780E-04	0.000E+00	0.000E+00
Ra-226+D	Po-210	1.000E+00	1.824E-04	8.321E-04	2.202E-03	5.193E-03	5.764E-03	4.716E-04	0.000E+00	0.000E+00
Ra-226+D	∑DSR(j)		1.682E+00	1.626E+00	1.520E+00	1.198E+00	5.986E-01	4.049E-02	0.000E+00	0.000E+00
Ra-226+D	Ra-226+D	1.339E-06	2.251E-06	2.175E-06	2.030E-06	1.592E-06	7.881E-07	5.308E-08	0.000E+00	0.000E+00
Ra-226+D	Pb-210+D1	1.339E-06	4.834E-10	1.390E-09	2.950E-09	6.327E-09	7.033E-09	7.125E-10	0.000E+00	0.000E+00
Ra-226+D	∑DSR(j)		2.252E-06	2.176E-06	2.033E-06	1.599E-06	7.952E-07	5.380E-08	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 30 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	1.487E+01	1.538E+01	1.645E+01	2.086E+01	4.176E+01	6.174E+02	*9.885E+11	*9.885E+11

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ra-226	5.000E+00	0.000E+00	1.682E+00	1.487E+01	1.682E+00	1.487E+01

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	8.406E+00	8.121E+00	7.579E+00	5.946E+00	2.943E+00	1.982E-01	0.000E+00	0.000E+00
Ra-226	Ra-226	1.339E-06	1.126E-05	1.087E-05	1.015E-05	7.962E-06	3.941E-06	2.654E-07	0.000E+00	0.000E+00
Ra-226	∑DOSE(j)		8.406E+00	8.121E+00	7.579E+00	5.946E+00	2.943E+00	1.982E-01	0.000E+00	0.000E+00
Pb-210	Ra-226	1.000E+00	1.501E-03	4.312E-03	9.137E-03	1.947E-02	2.119E-02	1.890E-03	0.000E+00	0.000E+00
Po-210	Ra-226	1.000E+00	9.120E-04	4.161E-03	1.101E-02	2.596E-02	2.882E-02	2.358E-03	0.000E+00	0.000E+00
Pb-210	Ra-226	1.339E-06	2.417E-09	6.948E-09	1.475E-08	3.164E-08	3.516E-08	3.563E-09	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-226	Ra-226	1.000E+00	5.000E+00	4.842E+00	4.541E+00	3.628E+00	1.910E+00	2.021E-01	3.304E-04	5.831E-14
Ra-226	Ra-226	1.339E-06	6.695E-06	6.484E-06	6.081E-06	4.858E-06	2.557E-06	2.707E-07	4.424E-10	7.807E-20
Ra-226	∑S(j):		5.000E+00	4.842E+00	4.541E+00	3.628E+00	1.910E+00	2.021E-01	3.304E-04	5.831E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.496E-01	4.121E-01	1.020E+00	1.322E+00	2.610E-01	4.831E-04	8.541E-14
Po-210	Ra-226	1.000E+00	0.000E+00	7.760E-02	3.137E-01	8.845E-01	1.186E+00	2.366E-01	4.386E-04	7.755E-14
Pb-210	Ra-226	1.339E-06	0.000E+00	2.003E-07	5.517E-07	1.366E-06	1.770E-06	3.494E-07	6.469E-10	1.144E-19

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 0.41 seconds

ATTACHMENT 6

RESRAD SINGLE RADIONUCLIDE GUIDELINE LEVEL CALCULATION RESULTS

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Dose Conversion Factor (and Related) Parameter Summary
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-227 (Source: DCFPAK3.02)	2.615E-04	2.615E-04	DCF1(1)
A-1	Ac-228 (Source: DCFPAK3.02)	5.044E+00	5.044E+00	DCF1(2)
A-1	At-218 (Source: DCFPAK3.02)	5.567E-05	5.567E-05	DCF1(3)
A-1	At-219 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(4)
A-1	Bi-210 (Source: DCFPAK3.02)	5.473E-03	5.473E-03	DCF1(5)
A-1	Bi-211 (Source: DCFPAK3.02)	2.410E-01	2.410E-01	DCF1(6)
A-1	Bi-212 (Source: DCFPAK3.02)	6.258E-01	6.258E-01	DCF1(7)
A-1	Bi-214 (Source: DCFPAK3.02)	9.135E+00	9.135E+00	DCF1(8)
A-1	Bi-215 (Source: DCFPAK3.02)	1.369E+00	1.369E+00	DCF1(9)
A-1	Fr-223 (Source: DCFPAK3.02)	1.758E-01	1.758E-01	DCF1(10)
A-1	Hg-206 (Source: DCFPAK3.02)	6.127E-01	6.127E-01	DCF1(11)
A-1	Pa-231 (Source: DCFPAK3.02)	1.608E-01	1.608E-01	DCF1(12)
A-1	Pa-234 (Source: DCFPAK3.02)	8.275E+00	8.275E+00	DCF1(13)
A-1	Pa-234m (Source: DCFPAK3.02)	1.257E-01	1.257E-01	DCF1(14)
A-1	Pb-210 (Source: DCFPAK3.02)	2.092E-03	2.092E-03	DCF1(15)
A-1	Pb-211 (Source: DCFPAK3.02)	3.680E-01	3.680E-01	DCF1(16)
A-1	Pb-212 (Source: DCFPAK3.02)	6.314E-01	6.314E-01	DCF1(17)
A-1	Pb-214 (Source: DCFPAK3.02)	1.257E+00	1.257E+00	DCF1(18)
A-1	Po-210 (Source: DCFPAK3.02)	5.641E-05	5.641E-05	DCF1(19)
A-1	Po-211 (Source: DCFPAK3.02)	4.707E-02	4.707E-02	DCF1(20)
A-1	Po-212 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(21)
A-1	Po-214 (Source: DCFPAK3.02)	4.801E-04	4.801E-04	DCF1(22)
A-1	Po-215 (Source: DCFPAK3.02)	9.452E-04	9.452E-04	DCF1(23)
A-1	Po-216 (Source: DCFPAK3.02)	8.873E-05	8.873E-05	DCF1(24)
A-1	Po-218 (Source: DCFPAK3.02)	9.228E-09	9.228E-09	DCF1(25)
A-1	Ra-223 (Source: DCFPAK3.02)	5.791E-01	5.791E-01	DCF1(26)
A-1	Ra-224 (Source: DCFPAK3.02)	4.950E-02	4.950E-02	DCF1(27)
A-1	Ra-226 (Source: DCFPAK3.02)	3.176E-02	3.176E-02	DCF1(28)
A-1	Ra-228 (Source: DCFPAK3.02)	6.575E-05	6.575E-05	DCF1(29)
A-1	Rn-218 (Source: DCFPAK3.02)	4.259E-03	4.259E-03	DCF1(30)
A-1	Rn-219 (Source: DCFPAK3.02)	2.970E-01	2.970E-01	DCF1(31)
A-1	Rn-220 (Source: DCFPAK3.02)	3.474E-03	3.474E-03	DCF1(32)
A-1	Rn-222 (Source: DCFPAK3.02)	2.130E-03	2.130E-03	DCF1(33)
A-1	Th-227 (Source: DCFPAK3.02)	5.641E-01	5.641E-01	DCF1(34)
A-1	Th-228 (Source: DCFPAK3.02)	7.248E-03	7.248E-03	DCF1(35)
A-1	Th-230 (Source: DCFPAK3.02)	1.106E-03	1.106E-03	DCF1(36)
A-1	Th-231 (Source: DCFPAK3.02)	3.250E-02	3.250E-02	DCF1(37)
A-1	Th-232 (Source: DCFPAK3.02)	4.782E-04	4.782E-04	DCF1(38)
A-1	Th-234 (Source: DCFPAK3.02)	2.316E-02	2.316E-02	DCF1(39)
A-1	Tl-206 (Source: DCFPAK3.02)	1.278E-02	1.278E-02	DCF1(40)
A-1	Tl-207 (Source: DCFPAK3.02)	2.391E-02	2.391E-02	DCF1(41)
A-1	Tl-208 (Source: DCFPAK3.02)	2.167E+01	2.167E+01	DCF1(42)
A-1	Tl-210 (Source: DCFPAK3.02)	1.677E+01	1.677E+01	DCF1(43)
A-1	U-234 (Source: DCFPAK3.02)	3.456E-04	3.456E-04	DCF1(44)
A-1	U-235 (Source: DCFPAK3.02)	7.005E-01	7.005E-01	DCF1(45)
A-1	U-238 (Source: DCFPAK3.02)	1.713E-04	1.713E-04	DCF1(46)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.714E-01	5.957E-01	DCF2(1)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
B-1	Pa-231	8.769E-01	8.769E-01	DCF2(2)
B-1	Pb-210+D	2.285E-02	2.231E-02	DCF2(3)
B-1	Pb-210+D1	2.284E-02	2.231E-02	DCF2(4)
B-1	Po-210	1.732E-02	1.732E-02	DCF2(5)
B-1	Ra-226+D	3.823E-02	3.811E-02	DCF2(6)
B-1	Ra-228+D	6.333E-02	6.327E-02	DCF2(8)
B-1	Th-228+D	1.753E-01	1.610E-01	DCF2(9)
B-1	Th-230	3.848E-01	3.848E-01	DCF2(10)
B-1	Th-232	4.255E-01	4.255E-01	DCF2(12)
B-1	U-234	3.737E-02	3.737E-02	DCF2(13)
B-1	U-235+D	3.378E-02	3.378E-02	DCF2(15)
B-1	U-238	3.212E-02	3.212E-02	DCF2(16)
B-1	U-238+D	3.215E-02	3.212E-02	DCF2(17)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	2.308E-03	1.450E-03	DCF3(1)
D-1	Pa-231	2.068E-03	2.068E-03	DCF3(2)
D-1	Pb-210+D	3.781E-03	3.774E-03	DCF3(3)
D-1	Pb-210+D1	3.781E-03	3.774E-03	DCF3(4)
D-1	Po-210	6.475E-03	6.475E-03	DCF3(5)
D-1	Ra-226+D	1.677E-03	1.676E-03	DCF3(6)
D-1	Ra-228+D	5.922E-03	5.920E-03	DCF3(8)
D-1	Th-228+D	9.348E-04	4.292E-04	DCF3(9)
D-1	Th-230	9.361E-04	9.361E-04	DCF3(10)
D-1	Th-232	1.029E-03	1.029E-03	DCF3(12)
D-1	U-234	2.150E-04	2.150E-04	DCF3(13)
D-1	U-235+D	2.048E-04	2.031E-04	DCF3(15)
D-1	U-238	1.939E-04	1.939E-04	DCF3(16)
D-1	U-238+D	2.112E-04	1.939E-04	DCF3(17)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Pb-210+D1 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(4,1)
D-34	Pb-210+D1 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(4,2)
D-34	Pb-210+D1 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(4,3)
D-34				
D-34	Po-210 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Po-210 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(5,2)
D-34	Po-210 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(6,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(6,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(6,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(8,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(8,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(8,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(9,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(9,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(10,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(10,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(10,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(12,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(13,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(13,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(13,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(15,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(15,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(15,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(16,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(16,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(16,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(17,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(17,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(17,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Pb-210+D1 , fish	3.000E+02	3.000E+02	BIOFAC(4,1)
D-5	Pb-210+D1 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Po-210 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Po-210 , crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(5,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(6,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(8,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(8,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(9,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(9,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(10,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(10,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(12,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(13,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(13,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(15,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(15,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(16,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(16,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(17,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(17,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	2.000E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	8.410E+00	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	3.100E-02	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Pa-231	3.100E-02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Po-210	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.040E-01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Th-228	2.100E-01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Th-230	8.170E-01	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Th-232	2.110E-01	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): U-234	5.370E-01	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g): U-235	3.100E-02	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-238	5.530E-01	0.000E+00	---	S1(16)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Po-210	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(10)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(13)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(16)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	not used	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	not used	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	not used	1	---	NS
R015	Unsat. zone 1, thickness (m)	not used	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	not used	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	not used	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	not used	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	not used	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.099E-01	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.426E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.217E-02	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Po-210				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	not used	1.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	not used	1.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.176E-01	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.165E-02	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	not used	7.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.165E-02	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.704E-05	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.704E-05	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04	---	DCNUCU(12,1)
R016	Saturated zone (cm**3/g)	not used	6.000E+04	---	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.704E-05	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.426E-02	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.426E-02	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	not used	5.000E+01	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.426E-02	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R017	Inhalation rate (m**3/yr)	1.350E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.055E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	2.250E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Summary : RESRAD - Fansteel Site - Outdoor Worker - SRGLs per Radium Benchmark Dose

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Contaminated Zone Dimensions	
Area:	2000.00 square meters
Thickness:	0.15 meters
Cover Depth:	0.00 meters

Initial Soil Concentrations, pCi/g	
Ac-227	3.100E-02
Pa-231	3.100E-02
Pb-210	1.000E+00
Po-210	1.000E+00
Ra-226	1.000E+00
Ra-228	2.040E-01
Th-228	2.100E-01
Th-230	8.170E-01
Th-232	2.110E-01
U-234	5.370E-01
U-235	3.100E-02
U-238	5.530E-01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 8.410E+00 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	2.260E+00	2.189E+00	2.056E+00	1.666E+00	9.922E-01	2.801E-01	0.000E+00	0.000E+00
M(t):	2.688E-01	2.603E-01	2.444E-01	1.981E-01	1.180E-01	3.331E-02	0.000E+00	0.000E+00

Maximum TDOSE(t): 2.260E+00 mrem/yr at t = 0.000E+00 years

Under an assumption that the the ratios of the radioisotopes in the U-238, U-235, and Th-232 decay-chains to Ra-226 in the Soils Stockpile ESI sample are representative, a 'cumulative' action level for Ra-226 was calculated to equal:
Radium Benchmark Dose of 8.41 mrem/yr ÷ 2.26 mrem/yr per 1 pCi/g of Ra-226 = 3.72 pCi/g of Ra-226.
This value can be used without the Unity Rule.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.092E-02	0.0048	7.692E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.074E-04	0.0001
Pa-231	1.070E-03	0.0005	1.066E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.940E-04	0.0001
Pb-210	1.444E-03	0.0006	1.227E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.197E-02	0.0141
Po-210	4.048E-06	0.0000	2.923E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-02	0.0056
Ra-226	1.672E+00	0.7398	1.509E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.050E-03	0.0036
Ra-228	2.035E-01	0.0900	6.919E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.299E-03	0.0023
Th-228	2.494E-01	0.1103	1.224E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.589E-04	0.0003
Th-230	4.718E-04	0.0002	1.246E-02	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.526E-03	0.0016
Th-232	1.212E-02	0.0054	3.598E-03	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-03	0.0006
U-234	3.692E-05	0.0000	7.782E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.204E-04	0.0002
U-235	4.202E-03	0.0019	4.062E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.863E-05	0.0000
U-238	1.535E-02	0.0068	6.893E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.265E-04	0.0002
Total	2.171E+00	0.9603	2.435E-02	0.0108	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.532E-02	0.0289

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-02	0.0053
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-03	0.0011
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.464E-02	0.0153
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.300E-02	0.0058
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.682E+00	0.7440
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.095E-01	0.0927
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.514E-01	0.1112
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-02	0.0073
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.705E-02	0.0075
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.335E-03	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.271E-03	0.0019
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.656E-02	0.0073
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.260E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	9.467E-03	0.0043	6.631E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.650E-04	0.0001
Pa-231	1.339E-03	0.0006	1.036E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.882E-04	0.0001
Pb-210	1.372E-03	0.0006	1.374E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.959E-02	0.0181
Po-210	5.217E-07	0.0000	3.750E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.630E-03	0.0007
Ra-226	1.616E+00	0.7379	1.493E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.889E-03	0.0041
Ra-228	2.422E-01	0.1106	9.220E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.726E-03	0.0022
Th-228	1.731E-01	0.0791	8.462E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.246E-04	0.0002
Th-230	1.052E-03	0.0005	1.238E-02	0.0057	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.505E-03	0.0016
Th-232	4.019E-02	0.0184	3.676E-03	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-03	0.0009
U-234	3.532E-05	0.0000	7.396E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.946E-04	0.0002
U-235	4.016E-03	0.0018	3.862E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.721E-05	0.0000
U-238	1.466E-02	0.0067	6.551E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.003E-04	0.0002
Total	2.103E+00	0.9606	2.386E-02	0.0109	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.239E-02	0.0285

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.040E-02	0.0047
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.663E-03	0.0012
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.233E-02	0.0193
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.668E-03	0.0008
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.626E+00	0.7427
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.479E-01	0.1132
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E-01	0.0797
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-02	0.0077
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.581E-02	0.0209
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-03	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.082E-03	0.0019
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.582E-02	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.189E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	7.109E-03	0.0035	4.926E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.969E-04	0.0001
Pa-231	1.722E-03	0.0008	9.697E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-04	0.0001
Pb-210	1.232E-03	0.0006	1.248E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.640E-02	0.0177
Po-210	8.657E-09	0.0000	6.166E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.681E-05	0.0000
Ra-226	1.508E+00	0.7335	1.460E-03	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-02	0.0051
Ra-228	2.508E-01	0.1220	1.025E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.658E-03	0.0018
Th-228	8.336E-02	0.0406	4.042E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.506E-04	0.0001
Th-230	2.150E-03	0.0010	1.221E-02	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.464E-03	0.0017
Th-232	1.027E-01	0.0499	3.875E-03	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.958E-03	0.0014
U-234	3.233E-05	0.0000	6.680E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.466E-04	0.0002
U-235	3.669E-03	0.0018	3.492E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.458E-05	0.0000
U-238	1.337E-02	0.0065	5.915E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.518E-04	0.0002
Total	1.974E+00	0.9603	2.298E-02	0.0112	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.868E-02	0.0285

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.799E-03	0.0038
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.966E-03	0.0014
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.888E-02	0.0189
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.743E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.520E+00	0.7394
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.555E-01	0.1243
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.402E-02	0.0409
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-02	0.0087
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-01	0.0533
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-03	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.729E-03	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.442E-02	0.0070
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.056E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	2.607E-03	0.0016	1.739E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.950E-05	0.0000
Pa-231	2.083E-03	0.0013	7.328E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.136E-04	0.0001
Pb-210	8.449E-04	0.0005	8.181E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.387E-02	0.0143
Po-210	5.090E-15	0.0000	3.510E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.526E-11	0.0000
Ra-226	1.183E+00	0.7104	1.304E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.363E-02	0.0082
Ra-228	1.212E-01	0.0728	5.074E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.307E-03	0.0008
Th-228	6.458E-03	0.0039	3.040E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.885E-05	0.0000
Th-230	5.400E-03	0.0032	1.163E-02	0.0070	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.328E-03	0.0020
Th-232	2.631E-01	0.1580	4.354E-03	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-03	0.0029
U-234	2.380E-05	0.0000	4.670E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.121E-04	0.0002
U-235	2.672E-03	0.0016	2.449E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.720E-05	0.0000
U-238	9.693E-03	0.0058	4.132E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.156E-04	0.0002
Total	1.597E+00	0.9590	2.045E-02	0.0123	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.786E-02	0.0287

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.851E-03	0.0017
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.030E-03	0.0018
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.553E-02	0.0153
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.198E+00	0.7194
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.230E-01	0.0738
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.507E-03	0.0039
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.036E-02	0.0122
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.723E-01	0.1634
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.029E-04	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.713E-03	0.0016
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.042E-02	0.0063
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.666E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	1.472E-04	0.0001	8.743E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.494E-06	0.0000
Pa-231	1.116E-03	0.0011	2.762E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.237E-05	0.0001
Pb-210	2.867E-04	0.0003	2.409E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.028E-03	0.0071
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.162E-29	0.0000
Ra-226	5.862E-01	0.5908	7.755E-04	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-02	0.0117
Ra-228	5.895E-03	0.0059	2.276E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.460E-05	0.0001
Th-228	4.284E-06	0.0000	1.844E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-08	0.0000
Th-230	1.090E-02	0.0110	9.958E-03	0.0100	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-03	0.0030
Th-232	3.401E-01	0.3428	4.085E-03	0.0041	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.971E-03	0.0050
U-234	1.042E-05	0.0000	1.659E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.106E-04	0.0001
U-235	1.072E-03	0.0011	8.774E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.115E-06	0.0000
U-238	3.833E-03	0.0039	1.461E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-04	0.0001
Total	9.496E-01	0.9571	1.569E-02	0.0158	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-02	0.0271

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-04	0.0002
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.475E-03	0.0015
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.555E-03	0.0076
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.162E-29	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.986E-01	0.6033
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.973E-03	0.0060
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.314E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.379E-02	0.0240
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.492E-01	0.3519
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.869E-04	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.087E-03	0.0011
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.090E-03	0.0041
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.922E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	4.970E-09	0.0000	1.774E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.091E-11	0.0000
Pa-231	3.615E-05	0.0001	5.210E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.559E-06	0.0000
Pb-210	6.000E-06	0.0000	2.375E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.930E-05	0.0002
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	3.959E-02	0.1413	4.599E-05	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.593E-04	0.0031
Ra-228	8.882E-08	0.0000	2.229E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.343E-10	0.0000
Th-228	2.575E-17	0.0000	7.225E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.479E-20	0.0000
Th-230	1.063E-02	0.0380	4.115E-03	0.0147	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.274E-03	0.0045
Th-232	2.195E-01	0.7837	1.696E-03	0.0061	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.072E-03	0.0074
U-234	1.710E-06	0.0000	3.639E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.232E-06	0.0000
U-235	3.513E-05	0.0001	1.718E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-07	0.0000
U-238	1.224E-04	0.0004	2.733E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.087E-06	0.0000
Total	2.700E-01	0.9638	5.871E-03	0.0210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.281E-03	0.0153

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.218E-09	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.292E-05	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.768E-05	0.0003
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.049E-02	0.1446
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.958E-08	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.586E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.602E-02	0.0572
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.233E-01	0.7972
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.581E-06	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.542E-05	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-04	0.0005
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.801E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	3.871E-01	3.353E-01	2.516E-01	9.196E-02	5.142E-03	1.683E-07	0.000E+00	0.000E+00
Pa-231	Pa-231	1.000E+00	7.220E-02	6.876E-02	6.235E-02	4.424E-02	1.642E-02	3.957E-04	0.000E+00	0.000E+00
Pa-231	Ac-227+D	1.000E+00	6.213E-03	1.715E-02	3.332E-02	5.349E-02	3.114E-02	9.887E-04	0.000E+00	0.000E+00
Pa-231	∑DSR(j)		7.841E-02	8.590E-02	9.567E-02	9.773E-02	4.756E-02	1.384E-03	0.000E+00	0.000E+00
Pb-210+D	Pb-210+D	1.000E+00	1.929E-02	1.817E-02	1.613E-02	1.060E-02	3.160E-03	3.433E-05	0.000E+00	0.000E+00
Pb-210+D	Po-210	1.000E+00	1.535E-02	2.416E-02	2.276E-02	1.493E-02	4.395E-03	4.335E-05	0.000E+00	0.000E+00
Pb-210+D	∑DSR(j)		3.464E-02	4.233E-02	3.888E-02	2.553E-02	7.555E-03	7.768E-05	0.000E+00	0.000E+00
Pb-210+D1	Pb-210+D1	1.339E-06	3.105E-08	2.928E-08	2.603E-08	1.723E-08	5.244E-09	6.471E-11	0.000E+00	0.000E+00
Po-210	Po-210	1.000E+00	1.300E-02	1.668E-03	2.743E-05	1.561E-11	2.213E-29	0.000E+00	0.000E+00	0.000E+00
Ra-226+D	Ra-226+D	1.000E+00	1.681E+00	1.624E+00	1.516E+00	1.189E+00	5.886E-01	3.964E-02	0.000E+00	0.000E+00
Ra-226+D	Pb-210+D	1.000E+00	3.002E-04	8.624E-04	1.827E-03	3.894E-03	4.238E-03	3.780E-04	0.000E+00	0.000E+00
Ra-226+D	Po-210	1.000E+00	1.823E-04	8.321E-04	2.202E-03	5.193E-03	5.764E-03	4.716E-04	0.000E+00	0.000E+00
Ra-226+D	∑DSR(j)		1.682E+00	1.626E+00	1.520E+00	1.198E+00	5.986E-01	4.049E-02	0.000E+00	0.000E+00
Ra-226+D	Ra-226+D	1.339E-06	2.251E-06	2.175E-06	2.030E-06	1.592E-06	7.881E-07	5.308E-08	0.000E+00	0.000E+00
Ra-226+D	Pb-210+D1	1.339E-06	4.834E-10	1.390E-09	2.950E-09	6.327E-09	7.033E-09	7.125E-10	0.000E+00	0.000E+00
Ra-226+D	∑DSR(j)		2.252E-06	2.176E-06	2.033E-06	1.599E-06	7.952E-07	5.380E-08	0.000E+00	0.000E+00
Ra-228+D	Ra-228+D	1.000E+00	8.086E-01	6.928E-01	5.085E-01	1.721E-01	7.712E-03	1.157E-07	0.000E+00	0.000E+00
Ra-228+D	Th-228+D	1.000E+00	2.184E-01	5.224E-01	7.440E-01	4.309E-01	2.157E-02	3.234E-07	0.000E+00	0.000E+00
Ra-228+D	∑DSR(j)		1.027E+00	1.215E+00	1.252E+00	6.030E-01	2.928E-02	4.391E-07	0.000E+00	0.000E+00
Th-228+D	Th-228+D	1.000E+00	1.197E+00	8.307E-01	4.001E-01	3.099E-02	2.054E-05	1.232E-16	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	1.978E-02	1.965E-02	1.938E-02	1.846E-02	1.583E-02	6.618E-03	0.000E+00	0.000E+00
Th-230	Ra-226+D	1.000E+00	3.660E-04	1.080E-03	2.431E-03	6.429E-03	1.319E-02	1.288E-02	0.000E+00	0.000E+00
Th-230	Pb-210+D	1.000E+00	4.364E-08	2.966E-07	1.466E-06	1.034E-05	4.494E-05	5.250E-05	0.000E+00	0.000E+00
Th-230	Po-210	1.000E+00	2.154E-08	2.323E-07	1.551E-06	1.307E-05	5.967E-05	6.447E-05	0.000E+00	0.000E+00
Th-230	∑DSR(j)		2.015E-02	2.073E-02	2.182E-02	2.491E-02	2.912E-02	1.961E-02	0.000E+00	0.000E+00
Th-230	Th-230	1.339E-06	2.649E-08	2.631E-08	2.596E-08	2.472E-08	2.119E-08	8.861E-09	0.000E+00	0.000E+00
Th-230	Ra-226+D	1.339E-06	4.900E-10	1.446E-09	3.255E-09	8.609E-09	1.766E-08	1.724E-08	0.000E+00	0.000E+00
Th-230	Pb-210+D1	1.339E-06	7.027E-14	4.779E-13	2.366E-12	1.680E-11	7.458E-11	9.897E-11	0.000E+00	0.000E+00
Th-230	∑DSR(j)		2.698E-08	2.776E-08	2.921E-08	3.335E-08	3.892E-08	2.620E-08	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	2.170E-02	2.156E-02	2.127E-02	2.025E-02	1.735E-02	7.210E-03	0.000E+00	0.000E+00
Th-232	Ra-228+D	1.000E+00	4.995E-02	1.400E-01	2.826E-01	5.367E-01	6.265E-01	4.009E-01	0.000E+00	0.000E+00
Th-232	Th-228+D	1.000E+00	9.155E-03	5.553E-02	2.150E-01	7.333E-01	1.011E+00	6.502E-01	0.000E+00	0.000E+00
Th-232	∑DSR(j)		8.081E-02	2.171E-01	5.189E-01	1.290E+00	1.655E+00	1.058E+00	0.000E+00	0.000E+00

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-234	U-234	1.000E+00	2.487E-03	2.364E-03	2.135E-03	1.493E-03	5.303E-04	1.027E-05	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	8.952E-08	2.618E-07	5.776E-07	1.426E-06	2.437E-06	1.360E-06	0.000E+00	0.000E+00
U-234	Ra-226+D	1.000E+00	1.112E-09	7.602E-09	3.808E-08	2.814E-07	1.391E-06	2.471E-06	0.000E+00	0.000E+00
U-234	Pb-210+D	1.000E+00	9.984E-14	1.449E-12	1.570E-11	3.189E-10	3.663E-09	9.428E-09	0.000E+00	0.000E+00
U-234	Po-210	1.000E+00	4.169E-14	9.729E-13	1.496E-11	3.869E-10	4.798E-09	1.156E-08	0.000E+00	0.000E+00
U-234	∑DSR(j)		2.487E-03	2.364E-03	2.136E-03	1.495E-03	5.342E-04	1.412E-05	0.000E+00	0.000E+00
U-234	U-234	1.339E-06	3.330E-09	3.165E-09	2.859E-09	2.000E-09	7.101E-10	1.375E-11	0.000E+00	0.000E+00
U-234	Th-230	1.339E-06	1.199E-13	3.506E-13	7.734E-13	1.909E-12	3.263E-12	1.821E-12	0.000E+00	0.000E+00
U-234	Ra-226+D	1.339E-06	1.489E-15	1.018E-14	5.099E-14	3.768E-13	1.863E-12	3.308E-12	0.000E+00	0.000E+00
U-234	Pb-210+D1	1.339E-06	1.608E-19	2.335E-18	2.535E-17	5.182E-16	6.079E-15	1.777E-14	0.000E+00	0.000E+00
U-234	∑DSR(j)		3.330E-09	3.165E-09	2.860E-09	2.002E-09	7.153E-10	1.889E-11	0.000E+00	0.000E+00
U-235+D	U-235+D	1.000E+00	1.378E-01	1.317E-01	1.203E-01	8.751E-02	3.503E-02	1.140E-03	0.000E+00	0.000E+00
U-235+D	Pa-231	1.000E+00	7.576E-07	2.176E-06	4.612E-06	9.825E-06	1.060E-05	8.423E-07	0.000E+00	0.000E+00
U-235+D	Ac-227+D	1.000E+00	4.400E-08	2.881E-07	1.311E-06	6.940E-06	1.442E-05	1.890E-06	0.000E+00	0.000E+00
U-235+D	∑DSR(j)		1.378E-01	1.317E-01	1.203E-01	8.753E-02	3.506E-02	1.142E-03	0.000E+00	0.000E+00
U-238	U-238	5.450E-07	1.173E-09	1.115E-09	1.007E-09	7.036E-10	2.493E-10	4.742E-12	0.000E+00	0.000E+00
U-238+D	U-238+D	1.000E+00	2.995E-02	2.860E-02	2.607E-02	1.885E-02	7.396E-03	2.300E-04	0.000E+00	0.000E+00
U-238+D	U-234	1.000E+00	3.481E-09	9.982E-09	2.107E-08	4.426E-08	4.567E-08	2.913E-09	0.000E+00	0.000E+00
U-238+D	Th-230	1.000E+00	8.358E-14	5.673E-13	2.797E-12	1.951E-11	8.204E-11	8.228E-11	0.000E+00	0.000E+00
U-238+D	Ra-226+D	1.000E+00	7.810E-16	1.139E-14	1.249E-13	2.647E-12	3.428E-11	1.343E-10	0.000E+00	0.000E+00
U-238+D	Pb-210+D	1.000E+00	5.620E-20	1.682E-18	3.920E-17	2.307E-15	7.258E-14	4.698E-13	0.000E+00	0.000E+00
U-238+D	Po-210	1.000E+00	2.036E-20	9.955E-19	3.403E-17	2.688E-15	9.373E-14	5.743E-13	0.000E+00	0.000E+00
U-238+D	∑DSR(j)		2.995E-02	2.860E-02	2.607E-02	1.885E-02	7.396E-03	2.300E-04	0.000E+00	0.000E+00
U-238+D	U-238+D	1.339E-06	4.011E-08	3.830E-08	3.491E-08	2.523E-08	9.904E-09	3.080E-10	0.000E+00	0.000E+00
U-238+D	U-234	1.339E-06	4.661E-15	1.337E-14	2.822E-14	5.926E-14	6.115E-14	3.901E-15	0.000E+00	0.000E+00
U-238+D	Th-230	1.339E-06	1.119E-19	7.596E-19	3.745E-18	2.613E-17	1.099E-16	1.102E-16	0.000E+00	0.000E+00
U-238+D	Ra-226+D	1.339E-06	1.046E-21	1.526E-20	1.673E-19	3.544E-18	4.590E-17	1.798E-16	0.000E+00	0.000E+00
U-238+D	Pb-210+D1	1.339E-06	9.050E-26	2.710E-24	6.327E-23	3.749E-21	1.204E-19	8.856E-19	0.000E+00	0.000E+00
U-238+D	∑DSR(j)		4.011E-08	3.830E-08	3.491E-08	2.523E-08	9.904E-09	3.080E-10	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 30 days) daughters.

Summary : RESRAD - Fansteel Site - Outdoor Worker - SRGLs per Radium Benchmark Dose
File : C:\USERS\DELHOMMK\DESKTOP\WESTON PROJECTS\FANSTEEL\RADIUM BENCHMARK DOSE\AUG 7\FANSTEEL RESRAD RADIUM BENCHMARK DOSE.RAD

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 8.410E+00 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	2.172E+01	2.508E+01	3.343E+01	9.146E+01	1.636E+03	4.996E+07	*7.232E+13	*7.232E+13
Pa-231	1.073E+02	9.790E+01	8.790E+01	8.606E+01	1.768E+02	6.075E+03	*4.723E+10	*4.723E+10
Pb-210	2.428E+02	1.987E+02	2.163E+02	3.294E+02	1.113E+03	1.083E+05	*7.632E+13	*7.632E+13
Po-210	6.467E+02	5.041E+03	3.066E+05	5.386E+11	*4.472E+15	*4.472E+15	*4.472E+15	*4.472E+15
Ra-226	5.001E+00	5.172E+00	5.533E+00	7.018E+00	1.405E+01	2.077E+02	*9.885E+11	*9.885E+11
Ra-228	8.189E+00	6.921E+00	6.715E+00	1.395E+01	2.872E+02	1.915E+07	*2.726E+14	*2.726E+14
Th-228	7.026E+00	1.012E+01	2.102E+01	2.714E+02	4.094E+05	*8.201E+14	*8.201E+14	*8.201E+14
Th-230	4.175E+02	4.057E+02	3.855E+02	3.376E+02	2.888E+02	4.289E+02	*2.062E+10	*2.062E+10
Th-232	1.041E+02	3.873E+01	1.621E+01	6.518E+00	5.082E+00	7.947E+00	*1.097E+05	*1.097E+05
U-234	3.382E+03	3.558E+03	3.938E+03	5.625E+03	1.574E+04	5.957E+05	*6.222E+09	*6.222E+09
U-235	6.104E+01	6.386E+01	6.992E+01	9.608E+01	2.399E+02	7.361E+03	*2.160E+06	*2.160E+06
U-238	2.808E+02	2.941E+02	3.226E+02	4.463E+02	1.137E+03	3.656E+04	*3.361E+05	*3.361E+05

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ac-227	3.100E-02	0.000E+00	3.871E-01	2.172E+01	3.871E-01	2.172E+01
Pa-231	3.100E-02	6.54 ± 0.01	1.011E-01	8.321E+01	7.841E-02	1.073E+02
Pb-210	1.000E+00	1.089 ± 0.002	4.236E-02	1.985E+02	3.464E-02	2.428E+02
Po-210	1.000E+00	0.000E+00	1.300E-02	6.467E+02	1.300E-02	6.467E+02
Ra-226	1.000E+00	0.000E+00	1.682E+00	5.001E+00	1.682E+00	5.001E+00
Ra-228	2.040E-01	2.159 ± 0.004	1.275E+00	6.598E+00	1.027E+00	8.189E+00
Th-228	2.100E-01	0.000E+00	1.197E+00	7.026E+00	1.197E+00	7.026E+00
Th-230	8.170E-01	38.56 ± 0.08	2.945E-02	2.856E+02	2.015E-02	4.175E+02
Th-232	2.110E-01	26.67 ± 0.05	1.660E+00	5.067E+00	8.081E-02	1.041E+02
U-234	5.370E-01	0.000E+00	2.487E-03	3.382E+03	2.487E-03	3.382E+03
U-235	3.100E-02	0.000E+00	1.378E-01	6.104E+01	1.378E-01	6.104E+01
U-238	5.530E-01	0.000E+00	2.995E-02	2.808E+02	2.995E-02	2.808E+02

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	1.200E-02	1.040E-02	7.799E-03	2.851E-03	1.594E-04	5.218E-09	0.000E+00	0.000E+00
Ac-227	Pa-231	1.000E+00	1.926E-04	5.315E-04	1.033E-03	1.658E-03	9.654E-04	3.065E-05	0.000E+00	0.000E+00
Ac-227	U-235	1.000E+00	1.364E-09	8.931E-09	4.063E-08	2.151E-07	4.471E-07	5.858E-08	0.000E+00	0.000E+00
Ac-227	∑DOSE(j)		1.219E-02	1.093E-02	8.832E-03	4.509E-03	1.125E-03	3.071E-05	0.000E+00	0.000E+00
Pa-231	Pa-231	1.000E+00	2.238E-03	2.131E-03	1.933E-03	1.371E-03	5.091E-04	1.227E-05	0.000E+00	0.000E+00
Pa-231	U-235	1.000E+00	2.349E-08	6.747E-08	1.430E-07	3.046E-07	3.286E-07	2.611E-08	0.000E+00	0.000E+00
Pa-231	∑DOSE(j)		2.238E-03	2.132E-03	1.933E-03	1.372E-03	5.095E-04	1.229E-05	0.000E+00	0.000E+00
Pb-210	Pb-210	1.000E+00	1.929E-02	1.817E-02	1.613E-02	1.060E-02	3.160E-03	3.433E-05	0.000E+00	0.000E+00
Pb-210	Pb-210	1.339E-06	3.105E-08	2.928E-08	2.603E-08	1.723E-08	5.244E-09	6.471E-11	0.000E+00	0.000E+00
Pb-210	Ra-226	1.000E+00	3.002E-04	8.624E-04	1.827E-03	3.894E-03	4.238E-03	3.780E-04	0.000E+00	0.000E+00
Pb-210	Th-230	1.000E+00	3.566E-08	2.423E-07	1.198E-06	8.446E-06	3.672E-05	4.289E-05	0.000E+00	0.000E+00
Pb-210	U-234	1.000E+00	5.361E-14	7.781E-13	8.432E-12	1.713E-10	1.967E-09	5.063E-09	0.000E+00	0.000E+00
Pb-210	U-238	1.000E+00	3.108E-20	9.300E-19	2.168E-17	1.276E-15	4.014E-14	2.598E-13	0.000E+00	0.000E+00
Pb-210	∑DOSE(j)		1.959E-02	1.903E-02	1.795E-02	1.451E-02	7.435E-03	4.552E-04	0.000E+00	0.000E+00
Po-210	Pb-210	1.000E+00	1.535E-02	2.416E-02	2.276E-02	1.493E-02	4.395E-03	4.335E-05	0.000E+00	0.000E+00
Po-210	Po-210	1.000E+00	1.300E-02	1.668E-03	2.743E-05	1.561E-11	2.162E-29	0.000E+00	0.000E+00	0.000E+00
Po-210	Ra-226	1.000E+00	1.823E-04	8.321E-04	2.202E-03	5.193E-03	5.764E-03	4.716E-04	0.000E+00	0.000E+00
Po-210	Th-230	1.000E+00	1.760E-08	1.898E-07	1.267E-06	1.068E-05	4.875E-05	5.268E-05	0.000E+00	0.000E+00
Po-210	U-234	1.000E+00	2.239E-14	5.225E-13	8.033E-12	2.078E-10	2.577E-09	6.206E-09	0.000E+00	0.000E+00
Po-210	U-238	1.000E+00	1.126E-20	5.505E-19	1.882E-17	1.486E-15	5.183E-14	3.176E-13	0.000E+00	0.000E+00
Po-210	∑DOSE(j)		2.854E-02	2.666E-02	2.499E-02	2.013E-02	1.021E-02	5.677E-04	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	1.681E+00	1.624E+00	1.516E+00	1.189E+00	5.886E-01	3.964E-02	0.000E+00	0.000E+00
Ra-226	Ra-226	1.339E-06	2.251E-06	2.175E-06	2.030E-06	1.592E-06	7.881E-07	5.308E-08	0.000E+00	0.000E+00
Ra-226	Th-230	1.000E+00	2.990E-04	8.825E-04	1.986E-03	5.253E-03	1.077E-02	1.052E-02	0.000E+00	0.000E+00
Ra-226	Th-230	1.339E-06	4.004E-10	1.182E-09	2.660E-09	7.034E-09	1.442E-08	1.409E-08	0.000E+00	0.000E+00
Ra-226	U-234	1.000E+00	5.972E-10	4.082E-09	2.045E-08	1.511E-07	7.472E-07	1.327E-06	0.000E+00	0.000E+00
Ra-226	U-234	1.339E-06	7.997E-16	5.466E-15	2.738E-14	2.023E-13	1.000E-12	1.777E-12	0.000E+00	0.000E+00
Ra-226	U-238	1.000E+00	4.319E-16	6.301E-15	6.908E-14	1.464E-12	1.896E-11	7.425E-11	0.000E+00	0.000E+00
Ra-226	U-238	1.339E-06	5.783E-22	8.437E-21	9.250E-20	1.960E-18	2.538E-17	9.942E-17	0.000E+00	0.000E+00
Ra-226	∑DOSE(j)		1.682E+00	1.625E+00	1.518E+00	1.194E+00	5.994E-01	5.016E-02	0.000E+00	0.000E+00
Pb-210	Ra-226	1.339E-06	4.834E-10	1.390E-09	2.950E-09	6.327E-09	7.033E-09	7.125E-10	0.000E+00	0.000E+00
Pb-210	Th-230	1.339E-06	5.741E-14	3.904E-13	1.933E-12	1.372E-11	6.093E-11	8.086E-11	0.000E+00	0.000E+00
Pb-210	U-234	1.339E-06	8.632E-20	1.254E-18	1.361E-17	2.783E-16	3.264E-15	9.545E-15	0.000E+00	0.000E+00
Pb-210	U-238	1.339E-06	5.004E-26	1.499E-24	3.499E-23	2.073E-21	6.660E-20	4.898E-19	0.000E+00	0.000E+00
Pb-210	∑DOSE(j)		4.834E-10	1.390E-09	2.952E-09	6.341E-09	7.093E-09	7.934E-10	0.000E+00	0.000E+00
Ra-228	Ra-228	1.000E+00	1.650E-01	1.413E-01	1.037E-01	3.511E-02	1.573E-03	2.361E-08	0.000E+00	0.000E+00
Ra-228	Th-232	1.000E+00	1.054E-02	2.955E-02	5.964E-02	1.133E-01	1.322E-01	8.459E-02	0.000E+00	0.000E+00
Ra-228	∑DOSE(j)		1.755E-01	1.709E-01	1.634E-01	1.484E-01	1.338E-01	8.459E-02	0.000E+00	0.000E+00
Th-228	Ra-228	1.000E+00	4.456E-02	1.066E-01	1.518E-01	8.790E-02	4.399E-03	6.597E-08	0.000E+00	0.000E+00
Th-228	Th-228	1.000E+00	2.514E-01	1.745E-01	8.402E-02	6.507E-03	4.314E-06	2.586E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	1.932E-03	1.172E-02	4.537E-02	1.547E-01	2.133E-01	1.372E-01	0.000E+00	0.000E+00
Th-228	∑DOSE(j)		2.979E-01	2.927E-01	2.812E-01	2.491E-01	2.178E-01	1.372E-01	0.000E+00	0.000E+00

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-230	Th-230	1.000E+00	1.616E-02	1.605E-02	1.584E-02	1.508E-02	1.293E-02	5.407E-03	0.000E+00	0.000E+00
Th-230	Th-230	1.339E-06	2.164E-08	2.149E-08	2.121E-08	2.020E-08	1.732E-08	7.240E-09	0.000E+00	0.000E+00
Th-230	U-234	1.000E+00	4.807E-08	1.406E-07	3.102E-07	7.656E-07	1.309E-06	7.304E-07	0.000E+00	0.000E+00
Th-230	U-234	1.339E-06	6.437E-14	1.883E-13	4.153E-13	1.025E-12	1.752E-12	9.781E-13	0.000E+00	0.000E+00
Th-230	U-238	1.000E+00	4.622E-14	3.137E-13	1.546E-12	1.079E-11	4.537E-11	4.550E-11	0.000E+00	0.000E+00
Th-230	U-238	1.339E-06	6.189E-20	4.201E-19	2.071E-18	1.445E-17	6.075E-17	6.092E-17	0.000E+00	0.000E+00
Th-230	∑DOSE(j)		1.616E-02	1.605E-02	1.584E-02	1.508E-02	1.293E-02	5.407E-03	0.000E+00	0.000E+00
Th-232	Th-232	1.000E+00	4.580E-03	4.549E-03	4.488E-03	4.273E-03	3.660E-03	1.521E-03	0.000E+00	0.000E+00
U-234	U-234	1.000E+00	1.335E-03	1.269E-03	1.147E-03	8.020E-04	2.848E-04	5.512E-06	0.000E+00	0.000E+00
U-234	U-234	1.339E-06	1.788E-09	1.700E-09	1.535E-09	1.074E-09	3.813E-10	7.381E-12	0.000E+00	0.000E+00
U-234	U-238	1.000E+00	1.925E-09	5.520E-09	1.165E-08	2.447E-08	2.525E-08	1.611E-09	0.000E+00	0.000E+00
U-234	U-238	1.339E-06	2.578E-15	7.392E-15	1.560E-14	3.277E-14	3.381E-14	2.157E-15	0.000E+00	0.000E+00
U-234	∑DOSE(j)		1.335E-03	1.269E-03	1.147E-03	8.020E-04	2.848E-04	5.514E-06	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	4.271E-03	4.082E-03	3.728E-03	2.713E-03	1.086E-03	3.533E-05	0.000E+00	0.000E+00
U-238	U-238	5.450E-07	6.485E-10	6.163E-10	5.566E-10	3.891E-10	1.379E-10	2.622E-12	0.000E+00	0.000E+00
U-238	U-238	1.000E+00	1.656E-02	1.582E-02	1.442E-02	1.042E-02	4.090E-03	1.272E-04	0.000E+00	0.000E+00
U-238	∑DOSE(j)		1.656E-02	1.582E-02	1.442E-02	1.042E-02	4.090E-03	1.272E-04	0.000E+00	0.000E+00
U-238	U-238	1.339E-06	2.218E-08	2.118E-08	1.931E-08	1.395E-08	5.477E-09	1.703E-10	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	3.100E-02	2.690E-02	2.026E-02	7.510E-03	4.408E-04	2.159E-08	1.048E-20	0.000E+00
Ac-227	Pa-231	1.000E+00	0.000E+00	8.996E-04	2.248E-03	4.049E-03	2.538E-03	1.209E-04	1.724E-08	5.976E-22
Ac-227	U-235	1.000E+00	0.000E+00	9.672E-09	7.481E-08	4.969E-07	1.152E-06	2.298E-07	1.060E-10	1.265E-23
Ac-227	∑S(j):		3.100E-02	2.780E-02	2.251E-02	1.156E-02	2.980E-03	1.211E-04	1.735E-08	6.102E-22
Pa-231	Pa-231	1.000E+00	3.100E-02	2.966E-02	2.714E-02	1.991E-02	8.213E-03	3.702E-04	5.281E-08	1.830E-21
Pa-231	U-235	1.000E+00	0.000E+00	6.275E-07	1.723E-06	4.213E-06	5.215E-06	7.842E-07	3.363E-10	3.913E-23
Pa-231	∑S(j):		3.100E-02	2.966E-02	2.715E-02	1.991E-02	8.218E-03	3.710E-04	5.314E-08	1.869E-21
Pb-210	Pb-210	1.000E+00	1.000E+00	9.480E-01	8.520E-01	5.863E-01	2.015E-01	4.797E-03	1.104E-07	6.452E-24
Pb-210	Pb-210	1.339E-06	1.339E-06	1.269E-06	1.141E-06	7.850E-07	2.698E-07	6.423E-09	1.478E-13	8.639E-30
Pb-210	Ra-226	1.000E+00	0.000E+00	2.992E-02	8.241E-02	2.040E-01	2.643E-01	5.219E-02	9.662E-05	1.708E-14
Pb-210	Th-230	1.000E+00	0.000E+00	5.370E-06	4.568E-05	4.180E-04	2.234E-03	5.828E-03	6.376E-03	6.174E-03
Pb-210	U-234	1.000E+00	0.000E+00	1.078E-11	2.728E-10	8.081E-09	1.180E-07	6.866E-07	8.712E-07	8.440E-07
Pb-210	U-238	1.000E+00	0.000E+00	7.815E-18	5.906E-16	5.730E-14	2.371E-12	3.514E-11	5.722E-11	5.551E-11
Pb-210	∑S(j):		1.000E+00	9.779E-01	9.344E-01	7.907E-01	4.681E-01	6.282E-02	6.473E-03	6.174E-03
Po-210	Pb-210	1.000E+00	0.000E+00	7.515E-01	7.799E-01	5.380E-01	1.849E-01	4.402E-03	1.013E-07	5.921E-24
Po-210	Po-210	1.000E+00	1.000E+00	1.291E-01	2.152E-03	1.286E-09	2.128E-27	0.000E+00	0.000E+00	0.000E+00
Po-210	Ra-226	1.000E+00	0.000E+00	1.552E-02	6.274E-02	1.769E-01	2.371E-01	4.732E-02	8.773E-05	1.551E-14
Po-210	Th-230	1.000E+00	0.000E+00	2.117E-06	2.998E-05	3.430E-04	1.955E-03	5.201E-03	5.698E-03	5.518E-03
Po-210	U-234	1.000E+00	0.000E+00	3.457E-12	1.587E-10	6.347E-09	1.019E-07	6.115E-07	7.786E-07	7.543E-07
Po-210	U-238	1.000E+00	0.000E+00	2.120E-18	3.091E-16	4.313E-14	2.018E-12	3.121E-11	5.114E-11	4.961E-11
Po-210	∑S(j):		1.000E+00	8.961E-01	8.448E-01	7.152E-01	4.240E-01	5.692E-02	5.787E-03	5.518E-03
Ra-226	Ra-226	1.000E+00	1.000E+00	9.684E-01	9.082E-01	7.255E-01	3.819E-01	4.043E-02	6.607E-05	1.166E-14
Ra-226	Ra-226	1.339E-06	1.339E-06	1.297E-06	1.216E-06	9.715E-07	5.114E-07	5.413E-08	8.847E-11	1.561E-20
Ra-226	Th-230	1.000E+00	0.000E+00	3.483E-04	1.012E-03	3.027E-03	6.813E-03	1.055E-02	1.090E-02	1.055E-02
Ra-226	Th-230	1.339E-06	0.000E+00	4.664E-10	1.355E-09	4.053E-09	9.123E-09	1.413E-08	1.459E-08	1.412E-08
Ra-226	U-234	1.000E+00	0.000E+00	1.043E-09	8.922E-09	8.328E-08	4.669E-07	1.329E-06	1.489E-06	1.442E-06
Ra-226	U-234	1.339E-06	0.000E+00	1.396E-15	1.195E-14	1.115E-13	6.252E-13	1.780E-12	1.994E-12	1.931E-12
Ra-226	U-238	1.000E+00	0.000E+00	1.006E-15	2.558E-14	7.693E-13	1.168E-11	7.423E-11	9.788E-11	9.484E-11
Ra-226	U-238	1.339E-06	0.000E+00	1.347E-21	3.425E-20	1.030E-18	1.564E-17	9.939E-17	1.311E-16	1.270E-16
Ra-226	∑S(j):		1.000E+00	9.688E-01	9.093E-01	7.286E-01	3.888E-01	5.098E-02	1.096E-02	1.055E-02
Pb-210	Ra-226	1.339E-06	0.000E+00	4.006E-08	1.103E-07	2.732E-07	3.539E-07	6.989E-08	1.294E-10	2.287E-20
Pb-210	Th-230	1.339E-06	0.000E+00	7.191E-12	6.116E-11	5.597E-10	2.991E-09	7.804E-09	8.537E-09	8.266E-09
Pb-210	U-234	1.339E-06	0.000E+00	1.443E-17	3.653E-16	1.082E-14	1.580E-13	9.194E-13	1.167E-12	1.130E-12
Pb-210	U-238	1.339E-06	0.000E+00	1.046E-23	7.908E-22	7.672E-20	3.175E-18	4.705E-17	7.662E-17	7.432E-17
Pb-210	∑S(j):		0.000E+00	4.007E-08	1.104E-07	2.737E-07	3.569E-07	7.769E-08	8.667E-09	8.267E-09
Ra-228	Ra-228	1.000E+00	2.040E-01	1.752E-01	1.292E-01	4.453E-02	2.122E-03	5.010E-08	3.021E-21	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	2.359E-02	6.126E-02	1.306E-01	1.652E-01	1.665E-01	1.653E-01	1.611E-01
Ra-228	∑S(j):		2.040E-01	1.988E-01	1.905E-01	1.751E-01	1.674E-01	1.665E-01	1.653E-01	1.611E-01
Th-228	Ra-228	1.000E+00	0.000E+00	5.729E-02	1.042E-01	6.737E-02	3.649E-03	8.632E-08	5.206E-21	0.000E+00
Th-228	Th-228	1.000E+00	2.100E-01	1.461E-01	7.075E-02	5.589E-03	3.958E-06	3.742E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	3.895E-03	2.542E-02	1.074E-01	1.640E-01	1.665E-01	1.653E-01	1.611E-01
Th-228	∑S(j):		2.100E-01	2.073E-01	2.004E-01	1.804E-01	1.676E-01	1.665E-01	1.653E-01	1.611E-01

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-230	Th-230	1.000E+00	8.170E-01	8.170E-01	8.169E-01	8.166E-01	8.159E-01	8.132E-01	8.057E-01	7.801E-01
Th-230	Th-230	1.339E-06	1.094E-06	1.094E-06	1.094E-06	1.093E-06	1.092E-06	1.089E-06	1.079E-06	1.045E-06
Th-230	U-234	1.000E+00	0.000E+00	4.830E-06	1.387E-05	3.989E-05	8.193E-05	1.098E-04	1.101E-04	1.066E-04
Th-230	U-234	1.339E-06	0.000E+00	6.468E-12	1.857E-11	5.341E-11	1.097E-10	1.471E-10	1.475E-10	1.428E-10
Th-230	U-238	1.000E+00	0.000E+00	6.970E-12	5.916E-11	5.373E-10	2.806E-09	6.835E-09	7.244E-09	7.014E-09
Th-230	U-238	1.339E-06	0.000E+00	9.333E-18	7.922E-17	7.195E-16	3.757E-15	9.152E-15	9.700E-15	9.391E-15
Th-230	∑S(j):		8.170E-01	8.170E-01	8.169E-01	8.167E-01	8.159E-01	8.133E-01	8.059E-01	7.802E-01
Th-232	Th-232	1.000E+00	2.110E-01	2.110E-01	2.110E-01	2.109E-01	2.108E-01	2.102E-01	2.087E-01	2.033E-01
U-234	U-234	1.000E+00	5.370E-01	5.138E-01	4.702E-01	3.450E-01	1.423E-01	6.425E-03	9.198E-07	3.229E-20
U-234	U-234	1.339E-06	7.190E-07	6.879E-07	6.296E-07	4.619E-07	1.906E-07	8.603E-09	1.232E-12	4.323E-26
U-234	U-238	1.000E+00	0.000E+00	1.494E-06	4.102E-06	1.003E-05	1.242E-05	1.868E-06	8.026E-10	9.400E-23
U-234	U-238	1.339E-06	0.000E+00	2.000E-12	5.492E-12	1.343E-11	1.663E-11	2.502E-12	1.075E-15	1.259E-28
U-234	∑S(j):		5.370E-01	5.138E-01	4.702E-01	3.450E-01	1.424E-01	6.427E-03	9.206E-07	3.238E-20
U-235	U-235	1.000E+00	3.100E-02	2.966E-02	2.715E-02	1.991E-02	8.218E-03	3.710E-04	5.314E-08	1.869E-21
U-238	U-238	5.450E-07	3.014E-07	2.883E-07	2.639E-07	1.936E-07	7.990E-08	3.607E-09	5.167E-13	1.817E-26
U-238	U-238	1.000E+00	5.530E-01	5.291E-01	4.842E-01	3.552E-01	1.466E-01	6.618E-03	9.480E-07	3.334E-20
U-238	∑S(j):		5.530E-01	5.291E-01	4.842E-01	3.552E-01	1.466E-01	6.618E-03	9.480E-07	3.334E-20
U-238	U-238	1.339E-06	7.405E-07	7.084E-07	6.484E-07	4.757E-07	1.963E-07	8.862E-09	1.269E-12	4.464E-26

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 3.14 seconds

ATTACHMENT 7

COVER THICKNESS CALCULATION RESULTS FOR TARGET MAXIMUM RISK OF 3X10-4

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	10 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*9.02E-02*	*8.06E-02*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***5.78E-05***	***2.15E-07***	***4.88E-04***	***5.46E-04***
*Total Risk	5.78E-05	2.15E-07	4.88E-04	**5.46E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	20 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*2.28E-01*	*1.75E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***5.78E-05***	***2.15E-07***	***1.93E-04***	***2.51E-04***
*Total Risk	5.78E-05	2.15E-07	1.93E-04	**2.51E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	20 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*2.28E-01*	*1.75E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***7.88E-05***	***2.94E-07***	***2.63E-04***	***3.42E-04***
*Total Risk	7.88E-05	2.94E-07	2.63E-04	**3.42E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	30 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*5.72E-01*	*3.26E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***7.88E-05***	***2.94E-07***	***1.05E-04***	***1.84E-04***
*Total Risk	7.88E-05	2.94E-07	1.05E-04	**1.84E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	30 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*5.72E-01*	*3.26E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***1.16E-04***	***4.31E-07***	***1.54E-04***	***2.70E-04***
*Total Risk	1.16E-04	4.31E-07	1.54E-04	**2.70E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	30 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*5.72E-01*	*3.26E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***1.31E-04***	***4.89E-07***	***1.75E-04***	***3.07E-04***
*Total Risk	1.31E-04	4.89E-07	1.75E-04	**3.07E-04**

Site-specific

Outdoor Worker Soil Inputs

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
B (PEF Dispersion Constant)	18.7762	18.7762
City (Climate Zone)	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
Cover layer thickness for GSF (gamma shielding factor) cm	0 cm	40 cm
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
PEF (particulate emission factor) m^3/kg	1359344438	1359344438
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
A_s (acres)	0.5	0.5
Slab size for ACF (area correction factor) m^2	1000000 m^2	2000 m^2
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	225
ET_{ow} (exposure time - outdoor worker) hr/day	8	8
IRA_{ow} (inhalation rate - outdoor worker) m^3/day	60	60
IRS_{ow} (soil intake rate - outdoor worker) mg/day	100	100
t_{ow} (time - outdoor worker) yr	25	25
TR (target cancer risk) unitless	1.0E-06	1.0E-06
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific
Outdoor Worker PRGs for Soil - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/g)	Inhalation PRG TR=1.0E-06 (pCi/g)	External Exposure PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	*7.62E-01*	*2.04E+02*	*1.28E+00*	*4.77E-01*

Site-specific
Outdoor Worker Risk for Soil - Secular Equilibrium

Isotope	Ingestion Risk	Inhalation Risk	External Exposure Risk	Total Risk
Secular Equilibrium Risk for Ra-226	***1.64E-04***	***6.12E-07***	***9.76E-05***	***2.62E-04***
*Total Risk	1.64E-04	6.12E-07	9.76E-05	**2.62E-04**

ATTACHMENT D

FANSTEEL GROUNDWATER RISK CHARACTERIZATION REPORT

GROUNDWATER RISK EVALUATION REPORT

FANSTEEL METALS/FMRI

MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

October 2020

FINAL

Prepared for:

Weston Solutions, Inc.

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ACRONYMS AND ABBREVIATIONS

ASL	above screening level
AT	averaging time
BCF	Bioconcentration Factor
BW	Body Weight
BSL	below screening level
C	Celsius
cm	centimeters
cm/cm	centimeters per centimeter
cm^2	square centimeters
cm/sec	centimeters per second
cm^3/s	cubic centimeters per second
COPC	Constituent of Potential Concern
CSF	Cancer Slope Factor
1,1-DCE	1,1-Dichloroethene
ED	Exposure Duration
EF	Exposure Frequency
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ESI	Expanded Site Investigation
Fansteel	Metals/FMRI
g	grams
G	RSL User's Guide
HEAST	Health Effects Assessment Summary Tables
HHEM	Human Health Evaluation Manual
HI	Hazard Index
HQ	Hazard Quotient
ILCR	Incremental Lifetime Cancer Risk
IRF	Ingestion Rate Fish
IRIS	Integrated Risk Information System
IRW	Ingestion Rate Water
IUR	Inhalation Unit Risk
Kg	kilogram
Kp	Dermal permeability coefficient
L	liter
LT	lifetime
MIBK	4-Methyl-2-pentanone
MW	monitoring well
NA	not available
NCDEQ	North Carolina Department of Environmental Quality
NCEA	National Center for Environmental Assessment
NELAP	National Environmental Laboratory Accreditation Program
NHANES	National Health and Nutrition Examination Survey
NUT	essential nutrient
ODEQ	Oklahoma Department of Environmental Quality
OLEM	Office of Land and Emergency Management

ACRONYMS AND ABBREVIATIONS

ORNL	Oak Ridge National Laboratory
PCE	Tetrachloroethene
pCi/g	picoCuries per gram
PPRTV	Provisional Peer Reviewed Toxicity Value
PRG	Preliminary Remediation Goal
Ra-228	Radium-228
RAGS	Risk Assessment Guidance for Superfund
RBC	Risk-Based Concentration
RfC	Reference Concentration
RfD	Reference Dose
RSL	Regional Screening Level
SA	Surface Area
SCDM	Superfund Chemical Data Matrix
SI	Site Inspection
START	Superfund Technical Assessment and Response Team
STSC	Superfund Health Risk Technical Support Center
TCE	Trichloroethene
Th-228	Thorium-228
THQ	Target Hazard Quotient
TR	Target Cancer Risk
U-234	Uranium-234
U-235	Uranium-235
U-238	Uranium-238
VI	Vapor intrusion
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compounds
Ww	wet weight
WESTON®	Weston Solutions, Inc.

1.0 INTRODUCTION

The purpose of this document is to present the results of a streamlined risk characterization of the groundwater located on the Fansteel Metals/FMRI (Fansteel) Site in Muskogee, Muskogee County, Oklahoma (the Site). The approach used to characterize these risks is as presented in the Groundwater Pathway Risk Analysis Scoping Document previously submitted to and approved by WESTON® (Weston Solutions, Inc.) and the U.S. Environmental Protection Agency (EPA), and based on the April 2019 groundwater data initially presented in the Expanded Site Investigation (ESI) Report (Weston, 2019) and reproduced herein as **Table 1**.

The ESI and the 2019 groundwater sampling results form the basis for the Groundwater Pathway Risk Evaluation. The Groundwater Pathway Risk Evaluation determines whether Site contaminants in groundwater pose a potential risk to human health if the current system of containment were to fail in the absence of any further remedial action, and on-site groundwater were to be used for drinking water or groundwater contamination migrated toward the Arkansas River to current drinking water intakes downstream. Contaminant identification, exposure assessment, toxicity assessment, and risk characterization were addressed by developing conservative risk-based concentrations for comparison to media concentrations. The maximum detected groundwater concentrations were used as potential future on-site drinking water concentrations. Potential surface water concentrations, fish tissue concentrations, and potential concentrations of Site contaminants at drinking water intakes downstream along the Arkansas River were developed from the maximum detected groundwater concentrations (**Table 1**). Indoor air exposure to on-site workers through the vapor intrusion (VI) pathway was also evaluated based on the maximum detected groundwater concentrations reported during the ESI (**Table 1**).

2.0 BACKGROUND

Fansteel operated a metal processing facility that produced tantalum and niobium metal products from 1957 to 1989. EPA contractors conducted a Site Inspection (SI) in October 1981 that included the collection of one soil sample and one sediment sample, at outfall and seepage locations from the Site to the Arkansas River. Based on the analytical results, an observed release to surface water was documented (Weston, 2019). In June 2018, the Oklahoma Department of Environmental Quality (ODEQ) performed a Preliminary Reassessment of the Site, the results of which indicated that further sampling was warranted. As part of an ESI conducted at the Site by the EPA Region 6 Superfund Technical Assessment and Response Team (START) in April 2019, twenty-seven groundwater samples (including three field duplicates) were collected from existing monitoring wells. The groundwater samples were submitted to a National Environmental Laboratory Accreditation Program (NELAP) certified laboratory, for the same analyses as the source samples (ESI, Appendix D). Sampling locations are presented in Figure 3-1 of the ESI. Sample results are included in **Table 1** of this report.

3.0 GROUNDWATER PATHWAY HUMAN HEALTH RISK EVALUATION APPROACH

The approach for the Risk Evaluation is based on what is known about the existing groundwater contamination on the Site, as reported in the ESI, and the potential human receptors and their associated groundwater exposure pathways under current and future land-use assumptions. Potential human health risks from exposures to Site groundwater contaminants were estimated using a simplified ratio approach. This approach follows the example of the EPA Regional Screening Level (RSL) calculator (EPA, 2020a);

and used generic tap water RSLs to evaluate potential drinking water exposures, RSLs developed using the RSL calculator for recreational surface water exposures and the fish ingestion pathway, and vapor intrusion screening levels (VISLs) (EPA, 2020b) to evaluate potential indoor air exposures. For the radiological contaminants, the preliminary remediation goals (PRGs) for radionuclides calculator for screening values was used with the same ratio approach as with the chemical contamination (EPA, 2020c).

3.1 SELECTION OF CONTAMINANTS OF POTENTIAL CONCERN (COPCS)

The selection of Contaminants of Potential Concern (COPCs) is a risk-based screening step to identify chemicals that should be included in the quantitative risk estimates. COPCs include only those chemicals with positive detections and are limited to those chemicals that exceed the selection criterion. A chemical was selected as a COPC if the maximum detected concentration was greater than the associated risk-based concentration (RBC). No potential COPCs were eliminated based on low frequency of detection.

The screening criteria used to identify COPCs for groundwater, surface water, downstream drinking water, indoor air, and fish ingestion pathways are presented in **Tables 2-1 through 2-5** and include the following:

- **EPA Regional Screening Levels (RSLs) for Tap Water.** The maximum concentrations detected in groundwater (**Table 1**) were compared to EPA RSLs for tap water (EPA, 2020a). The EPA RSL tap water exposure values were developed by EPA based on the methodology presented in Risk Assessment Guidance for Superfund (RAGS) Human Health Evaluation Manual (HHEM), Part B (EPA, 1991) and consider ingestion of drinking water, dermal absorption, and inhalation of volatiles during household water use. The EPA RSL tap water values for carcinogens were developed by EPA using an age-adjusted exposure equation, which assumes that a receptor uses a water supply for household purposes at a frequency of 350 days per year for a 26-year exposure period (6 years as a child and 20 years as an adult). The EPA RSLs for chemicals with non-cancer effects are based on a child exposed to tap water at a frequency of 350 days per year for a 6-year exposure period. For carcinogenic chemicals, the values used for COPC screening are based on a 1E-06 target incremental lifetime cancer risk (ILCR), corresponding to an incremental increase of 1 in 1,000,000 in the chance of developing cancer over a lifetime. EPA RSLs for chemicals with non-cancer effects are developed for a target hazard quotient (HQ) of 1 and for a target HQ of 0.1. The RSLs set to a target HQ of 0.1 were used to select COPCs to avoid eliminating chemicals that may contribute to a total hazard index (HI) greater than the threshold level of 1. For contaminants with both carcinogenic effects and non-cancer health effects, the lower of the RSL based on non-cancer HQ of 0.1 and the RSL based on 1E-06 cancer risk, is the prevailing RSL and was used to identify COPCs (**Table 2-1**).
- **EPA Preliminary Remediation Goals (PRGs) for Radionuclides.** The maximum concentrations detected in groundwater (**Table 1**) were compared to EPA PRGs for tap water exposure to radionuclides (EPA, 2020c). The EPA PRGs for radionuclide tap water exposure values were developed by EPA based on the methodology presented in RAGS HHEM, Part B (EPA, 1991), and consider ingestion of drinking water, inhalation of volatile radionuclides during household water use, and water immersion. The EPA PRGs for radionuclides were developed by EPA using an age-adjusted exposure equation, which assumes that a receptor uses a water supply for household purposes at a frequency of 350 days per year for a 26-year exposure period (6 years as a child and 20 years as an adult). The values used for COPC screening are based on a 1E-06 target ILCR (**Tables 2-1 and 2-2**).
- **EPA Vapor Intrusion Screening Level (VISL) Tables**. Groundwater concentrations were screened against EPA's Office of Land and Emergency Management (OLEM) 2020 non-

residential worker VISLs. The groundwater VISLs are developed using Henry's Law Constant to account for volatilization of groundwater contaminants into soil gas, an average groundwater temperature set to 25 °C, and an empirical attenuation factor of 0.001 to account for migration of volatile contaminants from soil gas into indoor air. The VISLs developed based on worker indoor air risks and hazards were adjusted to correspond to a HQ of 0.1 and cancer risk of 1E-06 (EPA, 2020b) (**Table 2-3**) for the purpose of screening. To account for spatial variability of COPCs within the aquifer, a point-by-point comparison of the data to the VISL is appropriate for a screening-level evaluation that incorporates generic screening levels; therefore, risk is characterized at each individual monitoring well that has COPCs identified.

- **Site-Specific Screening Levels for Fish Tissue Consumption.** Modeled fish tissue concentrations were compared to risk-based screening levels derived using the EPA RSL calculator and the EPA PRG radionuclide calculator. Given that the Site is located within a reservation of the Muscogee (Creek) Nation, the fish tissue screening levels were calculated based on adult and child subsistence anglers who rely on noncommercially caught fish as a major source of protein in their diets. The fish tissue screening levels were established at a HQ of 0.1 and a target ILCR of 1E-06 (**Table 2-4**).
- **Site-Specific Screening Levels for Surface Water.** Modeled surface water concentrations were compared to risk-based screening levels for adult and child recreators derived using the EPA RSL calculator. The surface water screening levels were established based on exposure to surface water through the incidental ingestion and dermal contact pathways at a HQ of 0.1 and a target ILCR of 1E-06 (**Table 2-5**).

Tables 2-1 through 2-5 also indicate which contaminants were selected as COPCs based on comparison of the maximum detected groundwater concentrations or modeled fish tissue and surface water concentrations to the screening criteria discussed above. Surrogate screening levels were used for some detected analytes as detailed in the notes on **Tables 2-1 through 2-5**.

3.2 HUMAN HEALTH GROUNDWATER EXPOSURE PATHWAY ANALYSIS

The groundwater pathway human health risk evaluation focused on those human populations potentially exposed to groundwater-impacted media currently and/or in the future. This approach ensures that the range of risks over various population subgroups are characterized for potential activities and land/water uses.

3.2.1 Exposure Media and Routes of Exposure

The potentially impacted media include groundwater, surface water near the facility, surface water at downstream drinking water intakes along the Arkansas River, and fish tissue. It may also include VI of volatiles into on-site buildings. The list below presents these media along with the likely routes of exposure:

- Groundwater – contaminants in groundwater used as drinking water may be ingested and absorbed through the skin by exposed humans while showering and bathing. Volatiles in groundwater used for household water use may be inhaled.
- Surface Water – contaminants in the surface water may be incidentally ingested and absorbed through the skin by exposed humans during recreational activities in the river.
- Drinking Water Intakes – contaminants in downstream drinking water intakes may be ingested and absorbed through the skin by exposed humans while showering and bathing. Volatiles in groundwater used for household water use may be inhaled.
- Fish – contaminants in edible fish tissue may be consumed by anglers and their families.

- Indoor Air – vapor phase volatile contamination from groundwater below on-site buildings could enter the breathing space of indoor workers and be inhaled.

3.2.2 Potentially Exposed Populations

The human health risk evaluation for the groundwater pathway focused on those human populations likely to be exposed to the potentially impacted media currently and/or in the future. Bluestone understands that the alluvium under the Site is not considered an aquifer because the groundwater yields are not sufficient to support sustained use, and that the groundwater quality is reported to range from poor to fair indicating that potable use of Site groundwater is unlikely to occur (Weston 2019). However, a search of the Oklahoma Water Resources Board database identified fifty-four privately owned domestic supply wells within a 4-mile radius of the Site boundary and seven domestic wells within a 1-mile radius. The nearest domestic well is located only 0.45-mile northwest of the property boundary (Weston 2019). Consequently, potable use of Site groundwater was conservatively included in the screening level risk assessment as a potentially complete future exposure scenario. Based on the current and potential future land and water uses, four potentially exposed populations are proposed to be evaluated in the human health risk evaluation for the groundwater pathway. These four potentially exposed populations include:

- Current nearby and future on-site residents (young child and adult) – it is possible that the current or future nearby or future on-site residents could use groundwater at the Site or water from downstream drinking water intakes for potable purposes. There are currently numerous privately owned drinking water wells within a 4-mile radius of the Site. The nearest domestic well is located 0.45-mile northwest of the property boundary. Potentially complete exposure routes to contaminated drinking water include incidental ingestion during showering/bathing, dermal contact, and inhalation during household water use. The evaluation of on-site groundwater as drinking water utilized maximum detected concentrations from ESI monitoring well data (**Table 1, Table 2-1**). Potable water use off-site was modeled using surface water concentrations based on estimated groundwater flux to the Arkansas River. See **Appendix A** and **Table 2-2**.
- Current/future on-site indoor workers – these are assumed to be workers in on-site buildings who could be exposed to vapor phase intrusion of volatile organics in groundwater as they infiltrate buildings and are subsequently inhaled during working hours. The VI assessment included in the ESI report (Weston, 2019) found that the Sintering Building, Service Building, and Electron Beam Building were impacted by sub-slab vapors of chloroform, ethylbenzene, tetrachloroethene (PCE), and/or TCE; however, only the northwest corner of the site was investigated, not the entire site. For this investigation, groundwater VOC concentrations at each monitoring well location (**Table 1**) were compared to the EPA VISLs for workers for the protection of indoor air anywhere on-site (**Table 2-3**).
- Current/future fish consumers – these receptors represent anglers who catch and consume fish from the Arkansas River downstream of the Site. It was assumed that the anglers share their catch with other household members (i.e., young children). For the purposes of this document, subsistence level fish consumption was assumed, as a conservative approach. Fish tissue concentrations were estimated from ESI groundwater data shown in **Table 1,** assuming discharge to the Arkansas River, dilution within the river due to mixing with uncontaminated surface water, and bioaccumulation in fish tissue. See **Appendix B** and **Table 2-4**.
- Current/future swimmers (child and adult) – the swimmers were assumed to contact surface water while engaging in recreational activities in the Arkansas River. The incidental ingestion and the dermal contact and absorption pathways were evaluated for these receptors. The evaluation of

recreational exposures to surface water utilized modeled surface water concentrations near the point of groundwater discharge to the Arkansas River. **See Appendix A** and **Table 2-5**.

3.2.3 Human Health Exposure Parameters

The exposure parameters that were used to evaluate each receptor population through the applicable exposure routes are presented below. For drinking water scenarios, the exposure parameters are those incorporated into the development of the generic tap water RSLs. For recreational surface water and fish ingestion exposures, the exposure parameters are those that are incorporated into the calculation of RSLs using the RSL calculator. For radionuclides, the preliminary remediation goals (PRGs) were used as screening levels. PRGs were calculated in a manner consistent with the exposure assumptions applied to evaluate chemical carcinogens. For the vapor intrusion scenario, the exposure parameters are those incorporated into the development of the worker VISLs. Given that the detected radionuclides are non-volatile, the indoor air exposure pathway was not evaluated.

To ensure that the risk estimates are conservative and protective of human health, both the generic tap water RSLs and the calculated recreational and fish ingestion RSLs were based on a combination of average and upper-end, typically the upper 90th or 95th percentile, exposure parameters. Many of the proposed exposure parameters are default values recommended by EPA in various current risk assessment guidance documents. In some cases, professional judgment was used to develop the proposed parameters.

3.2.3.1 Current Users/Future Residents – Drinking Water Scenario

The exposure factors used in the development of EPA's generic tap water RSLs and PRGs for the residential drinking water scenario are presented below and shown in **Appendix C**.

- The total exposure duration (ED) was assumed to be 26 years (6 years for young child and 20 years for adult) (EPA, 1991; EPA, 2011).
- The exposure frequency (EF) was 350 days/year for groundwater contact (EPA 1991).
- The child body weight (BW) is 15 kilograms (kg) (EPA, 2014a). The adult body weight is 80 kg (EPA, 2014a).
- The groundwater ingestion rate (IRW) values were assumed to be 2.5 liters per day (L/day) and 0.78 L/day for the adult and child, respectively (EPA, 2014a).
- The surface area (SA) for exposure while bathing/showering was 6,365 square centimeters (cm^2) and 19,652 cm^2 for the child and adult, respectively. The child bathing time was 0.54 hour/event and the adult showering time was 0.71 hour/event (EPA, 2014a).
- The dermal permeability coefficient (Kp) was obtained from Risk Assessment Guidance for Superfund (RAGS) Part E.

3.2.3.2 Current/Future Recreational Swimmers

The swimming scenario serves as a conservative estimate for waders, as well as swimmers. Therefore, only a swimming scenario was evaluated. The exposure factors used in the calculation of RSLs and PRGs for the swimmer are presented below and shown in **Appendix D**.

- The total ED was assumed to be 26 years (6 years for young child and 20 years for adult).
- The swimmers were assumed to be exposed to surface water for 5 months out of the year (May through September) when the weather is warmer and conducive to water contact activities for 1

day/week (assumes 4.33 weeks per month). This equates to an EF of approximately 22 days/year and is based on best professional judgment. The swimmers are not expected to contact the surface water during January through April and October through December.

- The child BW is 15 kg (EPA, 2014a). The adult BW is 80 kg (EPA, 2014a).
- Each surface water exposure event was assumed to last for 2 hours on the basis of best professional judgment.
- The incidental surface water ingestion rate (IRW) was assumed to be 0.12 L/hour for the child (EPA, 2011) and 0.11 L/hour for the adult (EPA, 2019).
- While swimming, it was assumed that the individual is fully immersed. Thus, the SAs for the child and the adult are 6,365 cm^2 and 19,652 cm^2, respectively (EPA, 2014a).
- The Kps were obtained from RAGS Part E.

3.2.3.3 Current/Future Fishermen

The subsistence fishing scenario serves as a conservative estimate for recreational fishermen, as well as subsistence fishermen. Therefore, only a subsistence fishing scenario was evaluated. The exposure factors used in the calculation of RSLs and PRGs for the fishermen are presented below and shown in **Appendix E**.

- The total ED was assumed to be 26 years (6 years for young child and 20 years for adult) (EPA, 1991; EPA, 2011).
- The residential EF of 350 days/year was used (EPA, 1991).
- The child BW was 15 kg (EPA, 2014a).
- The subsistence angler fish ingestion rate (IRF) of 142.4 g/day was assumed for adults (EPA, 2000). The child subsistence angler was assumed to consume 71.2 g/day of uncooked fish, or one-half the adult intake rate. A conservative child-to-adult intake ratio of approximately 1:2 is consistent with ingestion rates reported in the National Health and Nutrition Examination Survey (NHANES) (EPA, 2014b).

3.2.3.4 Current/Future Indoor Worker

The ESI report (Weston, 2019) evaluated VI using sub-slab soil gas sampling. The ESI report (Weston, 2019) evaluation of VI, found that the Sintering Building, Service Building, and Electron Beam Building were impacted by sub-slab vapors of chloroform, ethylbenzene, PCE, and/or TCE, but it only investigated the northwest corner of the Site, not the whole Site. Groundwater data collected on-site was screened against EPA VISLs for workers (EPA, 2020b). The EPA VISLs for workers incorporate the following assumptions:

- The total ED was 25 years.
- The EF was set to 250 days/year.
- Air exposure time 8 hours/day.

3.2.4 Exposure Point Concentrations

Exposure point concentrations (EPCs) were developed to compare to applicable risk-based concentrations in various media associated with the groundwater contamination. EPCs were developed for:

- Groundwater levels for drinking water from on-site or nearby groundwater wells for residential exposure.

- Surface water levels in the Arkansas River for exposure to recreational swimmers.
- Fish tissue concentrations for subsistence anglers.
- Groundwater data used to screen against applicable criteria for indoor worker exposure to indoor vapor.

The maximum detected groundwater concentrations (**Table 1**) were used as EPCs for potential future on-site drinking water. Surface water concentrations near the point of groundwater discharge to the Arkansas River were modeled from maximum detected on-site groundwater using a dilution factor for groundwater to surface water based on hydraulic conductivity and gradient, size of the groundwater plume, and Arkansas River surface water flow rates. See **Appendix A**. These same concentrations were used as initial potential concentrations at downstream drinking water intakes. Because these modeled concentrations were below screening levels, no further modeling of concentrations further downstream was performed. Fish tissue concentrations were modeled from the estimated surface water concentrations using chemical-specific bioconcentration factors (BCFs). See **Appendix B**. EPCs for each media are shown on **Tables 2-1 through 2-5**.

3.3 TOXICITY ASSESSMENT

Toxicity assessment for the COPCs typically examines information concerning the potential human health effects of exposure to COPCs. The goal of the toxicity assessment is to provide, for each COPC, a quantitative estimate of the relationship between the magnitude and type of exposure and the severity or probability of human health effects. The toxicity values are integrated with the exposure assessment (**Section 3.2**) to characterize the potential for the occurrence of adverse health effects (**Section 3.4**).

Toxicity values define the relationship between the dose received and the incidence of an adverse effect for the COPCs. Cancer slope factors (CSFs) and inhalation unit risk (IURs) factors are the dose-response values used to evaluate potential chemical carcinogens. Ingestion, inhalation, and external exposure CSFs for radionuclides represent estimates of lifetime attributable radiation cancer incidence risk per unit of activity. Non-carcinogenic effects, such as organ damage or reproductive effects, are evaluated by reference doses (RfDs) for oral exposure and reference concentrations (RfCs) for inhalation exposure. The entire toxicological database is used to guide the derivation of these toxicity values. These data may include epidemiological studies, long-term animal bioassays, short-term tests, and evaluations of molecular structure. Data from these sources are reviewed to determine if a chemical is likely to be toxic to humans. Because of the lack of available human studies, however, the majority of the toxicity data used to derive CSFs, IURs, RfDs, and RfCs comes from animal studies.

In a simplified ratio approach to risk characterization, toxicity values are incorporated into the risk-based screening values used to calculate risk. The EPA RSLs and VISLs use EPA's Integrated Risk Information System (IRIS) database (EPA, 2020d) as the primary source for RfD and RfC values, as well as for CSFs and IURs. EPA intends that IRIS supersedes all other sources of toxicity information for risk assessment. Additional sources for the dose-response values used in the determination of EPA RSLs and VISLs are the EPA National Center for Environmental Assessment (NCEA) in Cincinnati, Ohio, and the Health Effects Assessment Summary Tables (HEAST) (EPA, 1997). EPA uses the following hierarchy for selection of toxicity values (EPA, 2003):

- Tier 1 – EPA's IRIS;
- Tier 2 – EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk

Technical Support Center (STSC) develops PPRTVs on a chemical-specific basis when requested by EPA's Superfund program; and

- Tier 3 – Other toxicity values – Includes additional EPA and non-EPA sources of toxicity information.

The EPA radiological PRGs use the Oak Ridge National Laboratory Center for Radiation Protection Knowledge's Calculations of Slope Factors and Dose Coefficients (ORNL, 2014) as the primary source for CSFs.

3.4 RISK CHARACTERIZATION

Potential human health risks from exposures to Site contaminants were estimated using a simplified ratio approach. This approach follows the example of the EPA RSL calculator (EPA, 2020a).

The hazards associated with non-cancer effects were evaluated by comparing the EPCs to the EPA's non-cancer based RSLs. The ratio of the EPC to the non-cancer based RSL (RSL based on HQ equal to 1) is equal to the Site individual COPC HQ. The total hazard index (HI) for each scenario was generated by summing the individual HQs for all COPCs.

The risks associated with carcinogenic effects were evaluated by comparing the EPCs to the EPA's cancer based RSLs. Because the cancer based RSLs are based on a 1E-06 risk probability, the ratios of EPCs to RSLs are then multiplied by 1E-06 to estimate risk. The cumulative cancer risk for each scenario was generated by summing the individual cancer risks for all COPCs.

Some contaminants have both carcinogenic effects and non-carcinogenic effects and therefore have both a cancer risk calculation and a HQ calculation.

3.4.1 Future On-site Residents and Current Nearby Residents

The non-cancer hazards associated with drinking water COPCs were evaluated by comparing the EPCs to the EPA's non-cancer based RSLs for tap water (EPA, 2020a). For the on-site resident, the unsegregated non-cancer HI is greater than unity at 597. The most significant contributors to the hazard index (HI) are manganese (244), TCE (193), chromium (53), arsenic (28), iron (25), and aluminum (25) (**Table 3-1**).

The carcinogenic risks associated with drinking water COPCs were evaluated by comparing the drinking water EPCs to the EPA's cancer-based RSLs and PRGs for tap water (EPA, 2020a; EPA, 2020c). For the on-site resident, the cumulative ILCR is 1E+00 (1 in 1). Excess cancer risks result primarily from exposure to uranium-234 (1E+00), uranium-238 (1E+00), chromium (7E-02), arsenic (3E-03), radium-228 (2E-03), TCE (1E-03), and uranium-235 (1E-03) (**Table 3-1**).

For the current, nearby resident, no COPCs with systemic, non-cancer health effects were identified; consequently, a HI was not calculated (**Table 3-2**).

The cumulative ILCR for the nearby resident is within the EPA's risk management range at 6E-05 (**Table 3-2**). Only uranium-234 and uranium-238 had modeled activities above their associated tap water PRG.

3.4.2 Current/Future Swimmers (Child and Adult)

The hazards associated with non-cancer effects of surface water COPCs were evaluated by comparing the EPCs to the EPA's non-cancer based RSLs calculated for recreational exposures to surface water (EPA, 2020a). The risks associated with cancer effects of surface water COPCs were evaluated by comparing the

EPCs to the EPA's cancer based RSLs or PRGs calculated for recreational exposures to surface water (EPA, 2020a; EPA, 2020c). There were no constituents present in modeled surface water concentrations that exceeded the respective adult and child recreator RSLs or PRGs.

3.4.3 Current/Future Fish Consumers

The hazards associated with non-cancer effects of fish tissue COPCs were evaluated by comparing the EPCs to the EPA's non-cancer based RSLs calculated for fish ingestion exposures (EPA, 2020a). The risks associated with carcinogenic effects of fish tissue COPCs were evaluated by comparing the EPCs to the EPA's cancer based RSLs and PRGs calculated for fish ingestion exposures (EPA, 2020a; EPA, 2020c). There were no constituents present in modeled fish tissue concentrations that exceeded the respective subsistence angler RSLs or PRGs for the child and adult anglers. Therefore, there is no complete exposure pathway from groundwater to an angler in the Arkansas River, which is potentially exposed through the ingestion of fish through the groundwater-to-surface water migration pathway.

3.4.4 Current/Future On-site Workers

Groundwater data collected on-site was screened against EPA VISLs based on a 1E-06 cancer risk level and a 0.1 hazard index to derive the list of COPCs to carry forward for quantitative evaluation. Risk characterization for on-site workers was completed using EPA VISLS based on a 1E-06 target cancer risk and a HQ set to unity.

For current and future on-site workers, risk characterization was completed at each monitoring well (MW) location (**Section 3.1**). The following groundwater locations were quantitatively assessed based on the results of the screening procedure (**Table 2-3**):

- MW-53S
- MW-OW3
- MW-OW9

The HI associated with inhalation of volatile vapors emanating from groundwater and infiltrating indoor air at MW-53S is greater than 1 at 25 (**Table 3-3**). The most significant contributor to the HI is TCE, with a HQ of 25. The ILCR is within the EPA's risk management range at 7E-05 (**Table 3-3**).

The HI associated with inhalation of volatile vapors in indoor air at MW-OW3 is greater than 1 at 3 (**Table 3-3**). TCE was the only constituent detected above the respective worker VISL. The ILCR is within the EPA's risk management range at 9E-06 (**Table 3-3**).

The HI associated with inhalation of volatile vapors emanating from groundwater and infiltrating indoor air at MW-OW9 is equal to 1 (**Table 3-3**). TCE was the only constituent detected above the respective worker VISL. The ILCR is within the EPA's risk management range at 4E-06 (**Table 3-3**).

3.4.5 Uncertainty

EPA guidance for risk assessment provides a systematic means for organizing, analyzing, and presenting information on the nature and magnitude of potential risks to public health posed by chemical and radiological exposure. Despite the advanced state of the current methodology, uncertainties and limitations are inherent in the risk-assessment process. The uncertainty can lead to an over- or under-estimation of potential risk. In addition to chemical concentration, route, and duration of exposure, many other factors may influence the likelihood of developing cancer and non-cancer health effects. Uncertainty is also

compounded with regard to assumptions about scenario settings and availability of contaminated groundwater for contact. This section discusses the following factors that contribute to the uncertainties and limitations associated with the groundwater risk evaluation:

- Bluestone understands that the alluvium under the Site is not considered an aquifer because the groundwater yields are not sufficient to support sustained use, and that the groundwater quality is reported to range from poor to fair indicating that potable use of Site groundwater is unlikely to occur (Weston 2019). However, a search of the Oklahoma Water Resources Board database identified fifty-four privately owned domestic supply wells within a 4-mile radius of the Site boundary and seven domestic wells within a 1-mile radius. The nearest domestic well is located only 0.45-mile northwest of the property boundary (Weston 2019). Consequently, potable use of Site groundwater was conservatively included in the screening level risk assessment as a potentially complete future exposure scenario. If the aquifer is never used as a potable water source, then the risks are clearly overestimated.
- Groundwater was not filtered before sample collection, likely resulting in elevated detections of inorganic chemicals from suspended particles in the groundwater, resulting in an overestimation of risk.
- Sample analysis is subject to uncertainties associated with precision and accuracy, and detection of chemicals at low concentrations. Uncertainties associated with precision and accuracy of analysis are generally random. While these errors are typically of low magnitude compared to other sources of uncertainty in the risk evaluation, they may lead to a possible over- or under-estimation of risk.
- Maximum detected groundwater concentrations were used as EPCs for the future on-site resident. In addition, the maximum detected groundwater concentrations were used to derive EPCs for surface water, fish tissue, and indoor air exposure. The use of the maximum concentration may over-estimate actual exposure concentrations.
- Chromium was not speciated during analysis. Therefore, all chromium results were conservatively assumed to be hexavalent chromium for the screening process and for calculating risks and hazards. Hexavalent chromium is not the prevalent form of chromium; therefore, it is expected that risks and hazards are overestimated for chromium.
- Naturally occurring inorganic constituents and anthropogenic impacts for constituents that are commonly found in groundwater were included in the risk assessment process without consideration of the background contribution to total risk. Ignoring background risk is likely to result in an overestimation of site risk.
- An RfD has been established for chemical kidney toxicity of uranium. Total uranium results were not reported by the laboratory in the ESI; therefore, the non-cancer health effects associated with uranium exposure were not assessed. Given that the chemical toxicity of uranium is greater than the radiotoxicity, and that U-234 and U-238 are identified as risk-driving constituents in groundwater, the HI for the on-site resident and the current, nearby resident is likely underestimated.
- Surface water concentrations were not based on empirical data but were modeled from detected groundwater concentrations by incorporating a dilution factor. The dilution factor was based on the thickness and width of the groundwater plume at the surface water interface, hydraulic gradient, aquifer hydraulic conductivity, and the surface water flow rate of the Arkansas River near the Site. Maximum groundwater and mean or midpoint values for the northern section of the site were used for the other parameters. Values from the northern section of the Site resulted in a more conservative dilution factor than if values based on the characteristics of the southern part of the

Site were used. The dilution factor and subsequently estimated surface water concentrations are likely overestimated.

- Fish concentrations were not based on empirical data but were modeled from estimated surface water concentrations and bioconcentration factors. Bioconcentration factors may under- or overestimate actual tissue concentrations depending upon the dynamics of the aquatic system and site-specific target species. However, given that the surface water concentrations are likely overestimated, it is more likely than not that the fish tissue concentrations are overestimated.

4.0 CONCLUSIONS

The objectives of this Groundwater Pathway Risk Evaluation were to determine whether concentrations and activities of site-related constituents in groundwater may pose unacceptable risks to human health under site-specific exposure conditions, and to provide information to support decisions concerning the need for further evaluation or action based on current and reasonably anticipated future land use. Four receptor populations were identified for evaluation: (1) child and adult on-site and off-site residents, (2) child and adult surface water recreators, (3) child and adult subsistence anglers, and (4) on-site workers. The Risk Evaluation supports the following conclusions:

- The HI for the future on-site child resident exceeds the threshold level of 1. The HQs for multiple constituents, including manganese and TCE, exceed unity by a significant degree.
- The cumulative ILCR for the future on-site resident greatly exceeds the upper bound of the EPA's risk management range. The risk-driving constituents include the radionuclides U-234 and U-238; and the chemicals chromium, arsenic, and TCE.
- No unacceptable non-cancer hazards or cancer risks are posed to the nearby off-site resident potentially exposed to site-related COPCs in groundwater through drinking water intakes downstream.
- No unacceptable non-cancer hazards or cancer risks are posed to the child or adult surface water recreator that may swim in the Arkansas River.
- No unacceptable non-cancer hazards or cancer risks are posed to the child or adult subsistence angler from consuming fish potentially impacted by constituents in groundwater.
- Inhalation of volatile constituents in the interior space of a current or future non-residential building without either a vapor barrier or other appropriate engineering control to mitigate vapor intrusion represents a pathway of concern. Under uncontrolled conditions, non-cancer hazards exceed the threshold level of 1.
- The cumulative ILCR for the on-site worker is within the EPA's risk management range.

5.0 REFERENCES

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TABLES

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TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-51S MW-51S-20190410 4/10/2019 Field Sample		MW-52S MW-52S-20190410 4/10/2019 Field Sample		MW-53S MW-53S-20190409 4/9/2019 Field Sample		MW-53S MW-DUP1-20190409 4/9/2019 Field Duplicate	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	0.04	U	0.042	U	0.04	U	0.04	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.019	U	0.02	U	0.019	U	0.019	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	0.045	U	**0.12**	JQ	0.045	U	0.045	U
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	0.036	U	**0.12**	JQ	0.036	U	0.036	U
Acetophenone	-	0.2	98-86-2	µg/L	--	0.024	U	0.025	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.015	U	0.014	U	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.03	U	0.031	U	0.03	U	0.03	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	**0.06**	JQ	0.039	U	**0.055**	JQ	**0.068**	JQ
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.02	U	0.021	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.02	U	0.021	U	0.02	U	**0.054**	JQ
Isophorone	-	0.2	78-59-1	µg/L	--	0.025	U	0.026	U	0.025	U	0.025	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.02	U	0.021	U	0.02	U	0.02	U
Phenol	6000	0.2	108-95-2	µg/L	--	0.035	U	**0.2**	JQ	0.035	U	0.035	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	**6.9**		**6.9**	
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	**2**		**2.1**	
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	**89**		**88**	
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	**2**	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	**1.3**		**1.4**	
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	0.2	U	0.2	U	**13**		**12**	
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	**1.7**		**1.7**	
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	**0.68**	JQ	**0.64**	JQ
Trichloroethene	5	1	79-01-6	µg/L	--	0.2	U	0.2	U	**520**		**540**	
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	**0.021**		**0.0772**		**0.0109**		0.01	UB
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	0.0004	U	**0.000528**	JQ	**0.00263**		**0.00285**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.0563**		**0.125**		**0.023**		**0.0256**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Cadmium	0.005	0.002	7440-43-9	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Calcium	-	91.8	7440-70-2	mg/L	--	**30.6**		**23.1**		**38.5**		**42.5**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	**0.00128**	JQ	**0.000696**	JQ	**0.00469**		**0.00376**	JQ
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.000437**	JQ	0.0002	U	0.0002	U	0.0002	U
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.184**	JQ	**0.0724**	JQ	**0.0252**	JQ	**0.0227**	JQ
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**10.7**		**9.09**		**15.9**		**16.1**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**0.0023**	JQ	**0.00491**	JQ	**0.00178**	JQ	**0.00186**	JQ
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.00329**		0.0006	U	**0.00493**		**0.00404**	

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Potassium	-	2.532	7440-09-7	mg/L	--	**0.844**		**0.177**	JQ	**0.461**		**0.471**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	**0.0054**		**0.00296**		**0.00992**		**0.00793**	
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**85.4**		**57.7**		**114**		**126**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	**0.00464**		0.002	U	**0.00832**		**0.00797**	
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.18	U	0.09	U	0.06	U	0.06	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.44	U	0.4	U	0.09	U	0.25	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	0.037	U	0.017	U	0.006	U	0.042	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	-0.009	U	0.009	U	-0.005	U	-0.018	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.003	U	0.017	U	-0.006	U	-0.006	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	**0.32**	JH	0.013	U	0.16	U	0.102	UJ
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	0.026	U	0.041	U	-0.014	U	0.083	UJ
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	**0.24**	JH	0.079	U	0.027	U	0.06	UJ

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

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MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-54S MW-54S-20190409 4/9/2019 Field Sample		MW-55S MW-55S-20190410 4/10/2019 Field Sample		MW-56S MW-56S-20190410 4/10/2019 Field Sample		MW-57S MW-57S-20190411 4/11/2019 Field Sample	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	0.04	U	0.041	U	0.04	U	0.041	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.019	U	0.019	U	0.019	U	0.019	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	0.045	U	0.046	U	0.045	U	**0.08**	JQ
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	0.036	U	0.037	U	0.036	U	0.037	U
Acetophenone	-	0.2	98-86-2	µg/L	--	0.024	U	0.024	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	0.014	U	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.03	U	0.031	U	0.03	U	0.031	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	0.068	JQ	0.038	U	0.037	U	0.038	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.02	U	0.02	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.15	JQ	0.02	U	0.02	U	0.02	U
Isophorone	-	0.2	78-59-1	µg/L	--	0.025	U	0.026	U	0.025	U	0.026	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.02	U	0.02	U	0.02	U	0.02	U
Phenol	6000	0.2	108-95-2	µg/L	--	0.035	U	0.036	U	0.035	U	0.036	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	2	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	0.3	U	0.3	U
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	**0.078**	JK	**0.0887**		**0.0285**		**2.23**	
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.000428**	JQ	**0.0015**	JQ	**0.00157**	JQ	**0.153**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.134**		**0.0845**		**0.0283**		**0.0151**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	0.0002	U	**0.000205**	JQ	0.0002	U	**0.00165**	JQ
Cadmium	0.005	0.002	7440-43-9	mg/L	--	0.0002	U	0.0002	U	0.0002	U	**0.00158**	JQ
Calcium	-	91.8	7440-70-2	mg/L	--	**17.1**		**3.87**		**108**		**190**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	**0.00509**		**0.00177**	JQ	**0.00195**	JQ	**0.00273**	JQ
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.000901**	JQ	**0.000303**	JQ	**0.00702**		**0.0223**	
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.203**		**0.092**	JQ	**0.0513**	JQ	**0.231**	
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**6.48**		**2.02**		**63.1**		**51.4**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**0.054**		**0.00947**		**2.63**		**5.72**	
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.00818**		**0.00277**		**0.0212**		**0.0425**	

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-54S MW-54S-20190409 4/9/2019 Field Sample		MW-55S MW-55S-20190410 4/10/2019 Field Sample		MW-56S MW-56S-20190410 4/10/2019 Field Sample		MW-57S MW-57S-20190411 4/11/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**0.31**		**0.206**		**0.807**		**51.6**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	**0.00747**		0.0011	U	0.002	UB
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**32.9**		**15.6**		**91**		**233**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	**0.00205**	JQ	0.002	U	**0.0262**		**0.0116**	
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.08	U	0.15	U	0	U	0.06	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.33	U	0.45	U	0.38	U	0.52	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	0.013	U	0.042	U	0.012	U	-0.009	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.005	U	0.049	U	0.013	U	-0.007	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.005	U	-0.003	U	0.014	U	0.003	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	0.18	UJ	0.155	U	**5.05**		0.076	U
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	0.008	UJ	0.037	U	**0.3**	JH	0.003	U
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	0.013	UJ	0.048	U	**4.23**		0.163	U

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-57S MW-DUP3-20190411 4/11/2019 Field Duplicate		MW-62S MW-62S-20190411 4/11/2019 Field Sample		MW-63S MW-63S-20190411 4/11/2019 Field Sample		MW-64S MW-64S-20190409 4/9/2019 Field Sample	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	**0.071**	JQ	0.04	U	0.04	U	0.04	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.02	U	0.019	U	0.019	U	0.019	UJL
2-Methylphenol	-	0.2	95-48-7	µg/L	--	**0.095**	JQ	**0.14**	JQ	0.045	U	0.045	UJL
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	**0.11**	JQ	**0.12**	JQ	0.036	U	0.036	UJL
Acetophenone	-	0.2	98-86-2	µg/L	--	0.025	U	0.024	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	0.014	U	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.031	U	0.03	U	0.03	U	0.03	UJL
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	0.038	U	0.037	U	**0.058**	JQ	0.037	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.021	U	0.02	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.021	U	0.02	U	0.02	U	**0.24**	
Isophorone	-	0.2	78-59-1	µg/L	--	0.026	U	0.025	U	0.025	U	0.025	UJL
Naphthalene	400	0.1	91-20-3	µg/L	--	0.021	U	0.02	U	0.02	U	0.02	UJL
Phenol	6000	0.2	108-95-2	µg/L	--	**0.27**		**0.28**		0.035	U	0.035	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	2	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	0.3	U	0.3	U
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	**2.24**		0.0218		**2.36**		**5.39**	JK
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.159**		**0.035**		**0.00708**		**0.0182**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.0151**		**0.0258**		**0.112**		**0.0424**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	**0.00167**	JQ	0.0002	U	**0.00146**	JQ	**0.00369**	
Cadmium	0.005	0.002	7440-43-9	mg/L	--	**0.00161**	JQ	0.0004	U	0.0004	U	**0.000549**	JQ
Calcium	-	91.8	7440-70-2	mg/L	--	**194**		**70.7**		**29.4**		**91.2**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	**0.00288**	JQ	**0.00584**		0.0004	U	**0.00286**	JQ
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.0229**		**0.000401**	JQ	0.0002	U	**0.000271**	JQ
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.249**		**0.0369**	JQ	**0.016**	JQ	**0.119**	JQ
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**52.6**		**9.03**		**9.61**		**28.8**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**5.78**		**1.75**		**0.0919**		**0.431**	
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.0432**		**0.00444**		**0.00154**	JQ	**0.035**	

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-57S MW-DUP3-20190411 4/11/2019 Field Duplicate		MW-62S MW-62S-20190411 4/11/2019 Field Sample		MW-63S MW-63S-20190411 4/11/2019 Field Sample		MW-64S MW-64S-20190409 4/9/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**53.1**		**89.4**		**7.65**		**8.34**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**239**		**142**		**159**		**46.9**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	0.0002	U	0.0002	U	0.0002	U	**0.000207**	JQ
Zinc	6	0.01392	7440-66-6	mg/L	--	**0.00555**		0.002	U	0.002	U	**0.00439**	
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.03	U	0.07	U	0.23	U	0.26	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.52	U	0.16	U	0.79	U	0.33	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	0.006	U	0.003	U	0.004	U	0.023	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.013	U	0.001	U	-0.018	U	0.035	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0	U	0.009	U	0.004	U	0.013	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	0.07	U	**5.5**		**0.75**		**0.64**	
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	0.013	U	**0.39**	JH	0.047	U	0.017	U
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	0.078	U	**5.12**		**0.57**		**0.46**	

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-65S MW-65S-20190412 4/12/2019 Field Sample		MW-67S MW-67S-20190411 4/11/2019 Field Sample		MW-68S MW-68S-20190410 4/10/2019 Field Sample		MW-69S MW-69S-20190410 4/10/2019 Field Sample	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	**0.18**	JQ	**0.21**		0.04	U	0.04	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.02	U	0.019	U	0.019	U	0.019	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	**0.35**		**0.2**	JQ	0.045	U	0.045	U
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	**0.46**		**0.72**		0.036	U	0.036	U
Acetophenone	-	0.2	98-86-2	µg/L	--	0.025	U	0.024	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	**0.054**	JQ	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.031	U	0.03	U	0.03	U	0.03	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	0.038	U	0.037	U	0.037	U	0.037	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.021	U	0.02	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.021	U	0.02	U	0.02	U	0.02	U
Isophorone	-	0.2	78-59-1	µg/L	--	0.026	U	**0.061**	JQ	0.025	U	0.025	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.021	U	**0.022**	JQ	0.02	U	0.02	U
Phenol	6000	0.2	108-95-2	µg/L	--	0.036	U	0.035	U	0.035	U	0.035	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	2	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	**1**	JQ	0.2	U	0.2	U	0.2	U
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	0.3	U	0.3	U
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	**1.7**		0.2	U	0.2	U	0.2	U
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	32.3		**40.6**		**0.123**		**0.555**	
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.000615	UB	**0.00772**		0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.0767**		**0.165**		**0.00207**		**0.00115**	JQ
Barium	2	0.1689	7440-39-3	mg/L	--	**0.0804**		**0.0151**		**0.0397**		**0.062**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	**0.00957**		**0.00825**		0.0002	U	**0.000277**	JQ
Cadmium	0.005	0.002	7440-43-9	mg/L	--	**0.00231**		**0.000248**	JQ	0.0002	U	0.0002	U
Calcium	-	91.8	7440-70-2	mg/L	--	**51.2**		**0.441**	JQ	**7.1**		**10.6**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	**0.00476**		**0.0313**		**0.000815**	JQ	0.0004	U
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.0271**		**0.0118**		0.0002	U	0.0002	U
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	**0.0678**		0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.0541**	JQ	**0.505**		**0.112**	JQ	**0.0622**	JQ
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	**0.000778**	JQ	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**24.1**		**0.172**	JQ	**3.5**		**6.29**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**5.93**		**0.244**		**0.0164**		**0.000989**	JQ
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.117**		**0.0348**		**0.000993**	JQ	**0.000813**	JQ

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-65S MW-65S-20190412 4/12/2019 Field Sample		MW-67S MW-67S-20190411 4/11/2019 Field Sample		MW-68S MW-68S-20190410 4/10/2019 Field Sample		MW-69S MW-69S-20190410 4/10/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**36.4**		**4.48**		**0.139**	JQ	**0.371**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	**0.00266**		**0.00165**	JQ	0.0011	U
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	**0.000552**	JQ	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**37.4**		**96.6**		**74.6**		**3.43**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	**0.000559**	JQ	**0.000302**	JQ	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	**0.0254**		**0.00247**	JQ	0.002	U	0.002	U
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	**0.000126**	JQ	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.36	U	0.16	U	-0.06	U	0.13	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.41	Y1,U	0.76	U	0.16	U	0.24	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	-0.003	U	**0.4**		0.083	U	0.036	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.028	U	**0.37**		-0.053	U	0.014	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.017	U	**0.228**		0.009	U	0.008	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	**16.2**		**101**		0.22	U	**1.48**	
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	**0.93**		**5.5**		0.088	U	0.084	U
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	**17.2**		**104**		0.07	U	**1.11**	

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-69S MW-DUP2-20190410 4/10/2019 Field Duplicate		MW-70S MW-70S-20190411 4/11/2019 Field Sample		MW-71S MW-71S-20190411 4/11/2019 Field Sample		MW-72S MW-72S-20190410 4/10/2019 Field Sample	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	0.04	U	0.04	U	**0.35**		0.041	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.019	U	0.019	U	0.019	U	0.019	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	0.045	U	**0.051**	JQ	**2.7**		0.046	U
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	0.036	U	**0.12**	JQ	**3.5**		0.037	U
Acetophenone	-	0.2	98-86-2	µg/L	--	0.024	U	0.024	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	0.014	U	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.03	U	0.03	U	0.031	U	0.031	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	0.037	U	**0.055**	JQ	**0.055**	JQ	0.038	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.02	U	0.02	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.02	U	0.02	U	0.02	U	0.02	U
Isophorone	-	0.2	78-59-1	µg/L	--	0.025	U	0.025	U	0.026	U	0.026	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.02	U	0.02	U	0.02	U	0.02	U
Phenol	6000	0.2	108-95-2	µg/L	--	0.035	U	**0.17**	JQ	**4.5**		0.036	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	2	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	0.3	U	0.3	U
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	**0.598**		**0.262**		**3.25**		**0.0866**	
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.00115**	JQ	**0.0143**		**0.00472**		**0.131**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.0627**		**0.169**		**0.037**		**0.504**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	**0.000313**	JQ	**0.000267**	JQ	**0.0053**		**0.000537**	JQ
Cadmium	0.005	0.002	7440-43-9	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Calcium	-	91.8	7440-70-2	mg/L	--	**10.3**		**53.2**		**127**		**221**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	0.0004	U	0.0004	U	**0.0106**		0.0004	U
Cobalt	0.006	0.005	7440-48-4	mg/L	--	0.0002	U	**0.000215**	JQ	**0.000621**	JQ	**0.00145**	JQ
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	**0.00153**	JQ	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.0694**	JQ	0.012	U	**0.286**		**34.5**	
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**6.19**		**21.2**		**31.9**		**73.4**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**0.00113**	JQ	**0.0709**		**0.272**		**10.4**	
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.000947**	JQ	**0.000761**	JQ	**0.00257**		**0.00146**	JQ

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-69S MW-DUP2-20190410 4/10/2019 Field Duplicate		MW-70S MW-70S-20190411 4/11/2019 Field Sample		MW-71S MW-71S-20190411 4/11/2019 Field Sample		MW-72S MW-72S-20190410 4/10/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**0.373**		**161**		**120**		**5.79**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	**0.0033**		0.0011	U	0.0011	U
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**3.43**		**28.4**		**33.7**		**51**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	0.002	U	**0.00219**	JQ	**0.00883**		**0.00215**	JQ
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.24	U	0.06	U	0.03	U	0.31	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.32	U	0.01	U	0.48	U	0.88	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	0.074	U	0.013	U	0.046	U	0.003	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.002	U	-0.028	U	0.033	U	0.003	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.017	U	0	U	0.012	U	0	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	**1.42**		**2.14**		**24.3**		0.24	U
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	0.064	U	0.136	U	**1.59**		0.062	U
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	**1.08**		**1.72**		**25**		0.176	U

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-75S MW-75S-20190410 4/10/2019 Field Sample		MW-OW3 MW-OW3-20190411 4/11/2019 Field Sample		MW-OW4 MW-OW4-20190412 4/12/2019 Field Sample		MW-OW5 MW-OW5-20190412 4/12/2019 Field Sample	
SVOC													
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	0.04	U	0.04	U	0.041	U	**0.32**	
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.019	U	0.019	U	**0.037**	JQ	0.02	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	0.045	U	0.045	U	**0.074**	JQ	**0.51**	
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	0.036	U	0.036	U	**0.28**		**4.6**	
Acetophenone	-	0.2	98-86-2	µg/L	--	0.024	U	0.024	U	**0.15**	JQ	0.025	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	0.014	U	0.015	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.03	U	0.03	U	**0.28**	n	0.031	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	0.037	U	**0.051**	JQ	0.038	U	0.039	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.02	U	0.02	U	**0.028**	JQ	0.021	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.02	U	0.02	U	0.02	U	0.021	U
Isophorone	-	0.2	78-59-1	µg/L	--	0.025	U	0.025	U	0.026	U	0.026	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.02	U	0.02	U	**0.041**	JQ	**0.057**	JQ
Phenol	6000	0.2	108-95-2	µg/L	--	0.035	U	0.035	U	**0.09**	JQ	0.036	U
VOC													
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	**4.7**		0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	**5.1**		1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	**10000**		0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	**470**		2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	**47**		0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	**3.2**		0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	0.2	U	**1.9**		0.2	U	0.2	U
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	**1.8**		0.3	U	0.3	U
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	0.2	U	**64**		0.2	U	0.2	U
Metals													
Aluminum	-	0.063	7429-90-5	mg/L	--	**0.331**		**0.0337**		**492**		**1.07**	
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	**0.00422**		0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.00165**	JQ	**0.00402**		**0.0316**		**0.0293**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.128**		**0.0254**		**0.00917**		**0.534**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	0.0002	U	0.0002	U	**0.088**		**0.00456**	
Cadmium	0.005	0.002	7440-43-9	mg/L	--	0.0002	U	0.0002	U	**0.0129**		0.0002	U
Calcium	-	91.8	7440-70-2	mg/L	--	**35.8**		**85**		**0.331**	JQ	**53**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	0.0004	U	**0.00272**	JQ	**2.33**		**0.000657**	JQ
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.00171**	JQ	**0.000326**	JQ	**0.0931**		**0.00128**	JQ
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.823**		**0.0347**	JQ	**354**		**5.02**	
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**6.93**		**39.8**		**0.242**		**15.9**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**0.123**		**0.379**		**105**		**2.4**	
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.00114**	JQ	**0.00596**		**0.484**		**0.00181**	JQ

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-75S MW-75S-20190410 4/10/2019 Field Sample		MW-OW3 MW-OW3-20190411 4/11/2019 Field Sample		MW-OW4 MW-OW4-20190412 4/12/2019 Field Sample		MW-OW5 MW-OW5-20190412 4/12/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**2.84**		**0.481**		**4.83**		**35.6**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	**0.0161**		0.0011	U	0.0011	U
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	**0.0231**		0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**6.98**		**268**		**30**		**95.2**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	0.002	U	0.002	U	**0.826**		**0.0118**	
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Radionuclides*													
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.16	U	0.2	U	0.23	U	0	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.46	U	-0.15	U	0.05	U	0.43	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	-0.018	U	0.012	U	0.163	U	0.045	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.004	U	0.057	U	0.062	U	-0.001	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.008	U	0.009	U	0.045	U	-0.006	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	0.17	U	**2.66**		**1910**		**3**	JL
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	0.024	U	0.062	U	**89**		0.19	UJ
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	0.084	U	**1.7**		**1940**		**2.9**	JL

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-OW6 MW-OW6-20190411 4/11/2019 Field Sample		MW-OW8 MW-OW8-20190410 4/10/2019 Field Sample		MW-OW9 MW-OW9-20190411 4/11/2019 Field Sample	
SVOC											
2,4-Dimethylphenol	400	0.2	105-67-9	µg/L	--	0.041	U	**0.043**	JQ	0.041	U
2-Methylnaphthalene	80	0.1	91-57-6	µg/L	--	0.019	U	0.019	U	0.019	U
2-Methylphenol	-	0.2	95-48-7	µg/L	--	0.046	U	**2.7**		0.046	U
3&4-Methylphenol	2000	0.2	3/4-CRESOL	µg/L	--	0.037	U	**0.2**	JQ	0.037	U
Acetophenone	-	0.2	98-86-2	µg/L	--	0.024	U	0.024	U	0.024	U
Anthracene	6000	0.1	120-12-7	µg/L	--	0.014	U	0.014	U	0.014	U
Benzaldehyde	-	0.2	100-52-7	µg/L	--	0.031	U	0.03	U	0.031	U
Bis(2-ethylhexyl)phthalate	5.5	0.2	117-81-7	µg/L	--	**0.039**	JQ	0.037	U	0.038	U
Di-n-butyl phthalate	2000	0.2	84-74-2	µg/L	--	0.02	U	0.02	U	0.02	U
Di-n-octyl phthalate	200	0.2	117-84-0	µg/L	--	0.02	U	0.02	U	0.02	U
Isophorone	-	0.2	78-59-1	µg/L	--	0.026	U	0.025	U	0.026	U
Naphthalene	400	0.1	91-20-3	µg/L	--	0.02	U	0.02	U	0.02	U
Phenol	6000	0.2	108-95-2	µg/L	--	0.036	U	**0.39**		0.036	U
VOC											
1,1,1-Trichloroethane	200	1	71-55-6	µg/L	--	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	13	1	75-34-3	µg/L	--	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	7	1	75-35-4	µg/L	--	0.2	U	0.2	U	**0.69**	JQ
2-Butanone	10,000	2	78-93-3	µg/L	--	0.5	U	0.5	U	0.5	U
2-Hexanone	-	2	591-78-6	µg/L	--	1	U	1	U	1	U
4-Methyl-2-pentanone (MIBK)	10,000	2	108-10-1	µg/L	--	0.7	U	0.7	U	0.7	U
Acetone	10,000	2	67-64-1	µg/L	--	2	U	2	U	2	U
Carbon disulfide	2,000	2	75-15-0	µg/L	--	0.6	U	0.6	U	0.6	U
Chloroform	2.5	1	67-66-3	µg/L	--	0.2	U	0.2	U	0.2	U
cis-1,2-Dichloroethene	40	1	156-59-2	µg/L	--	**0.81**	JQ	0.2	U	**0.58**	JQ
Tetrachloroethene	5	1	127-18-4	µg/L	--	0.3	U	0.3	U	**0.47**	JQ
Toluene	1,000	1	108-88-3	µg/L	--	0.2	U	0.2	U	0.2	U
Trichloroethene	5	1	79-01-6	µg/L	--	**0.88**	JQ	0.2	U	**28**	
Metals											
Aluminum	-	0.063	7429-90-5	mg/L	--	**1.77**		**0.0275**		**0.0282**	
Antimony	0.006	0.01	7440-36-0	mg/L	--	0.0004	U	0.0004	U	0.0004	U
Arsenic	0.00005	0.002	7440-38-2	mg/L	--	**0.0476**		**0.0259**		**0.029**	
Barium	2	0.1689	7440-39-3	mg/L	--	**0.0556**		**0.236**		**0.0355**	
Beryllium	0.004	0.002	7440-41-7	mg/L	--	**0.00631**		**0.000338**	JQ	0.0002	U
Cadmium	0.005	0.002	7440-43-9	mg/L	--	**0.000918**	JQ	0.0002	U	0.0002	U
Calcium	-	91.8	7440-70-2	mg/L	--	**17.9**		**124**		**129**	
Chromium	0.00005	0.004	7440-47-3	mg/L	--	0.0004	U	0.0004	U	0.0004	U
Cobalt	0.006	0.005	7440-48-4	mg/L	--	**0.0104**		**0.000847**	JQ	**0.00156**	JQ
Copper	0.8	0.002	7440-50-8	mg/L	--	0.001	U	0.001	U	0.001	U
Iron	10	0.2	7439-89-6	mg/L	--	**0.134**	JQ	**16.3**		**2.1**	
Lead	150	0.002	7439-92-1	mg/L	--	0.0006	U	0.0006	U	0.0006	U
Magnesium	-	32.1	7439-95-4	mg/L	--	**12.5**		**104**		**53.2**	
Manganese	2.8	0.005	7439-96-5	mg/L	--	**6.54**		**5.2**		**1.05**	
Nickel	0.4	0.00987	7440-02-0	mg/L	--	**0.0315**		**0.00208**		**0.0164**	

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Analyte	SCDM Benchmark (lowest value)	3 x Backgroud (MW-51S) or RL	CAS Number	Units	Station: Sample ID: Date: Type:	MW-OW6 MW-OW6-20190411 4/11/2019 Field Sample		MW-OW8 MW-OW8-20190410 4/10/2019 Field Sample		MW-OW9 MW-OW9-20190411 4/11/2019 Field Sample	
Potassium	-	2.532	7440-09-7	mg/L	--	**42.6**		**3.26**		**2.82**	
Selenium	0.05	0.0162	7782-49-2	mg/L	--	0.0011	U	0.0011	U	0.0011	U
Silver	0.1	0.002	7440-22-4	mg/L	--	0.0002	U	0.0002	U	0.0002	U
Sodium	-	256.2	7440-23-5	mg/L	--	**101**		**46.5**		**180**	
Thallium	0.0002	0.002	7440-28-0	mg/L	--	**0.000768**	JQ	0.0002	U	0.0002	U
Zinc	6	0.01392	7440-66-6	mg/L	--	**0.00496**		**0.00263**	JQ	**0.00439**	
Mercury	0.002	0.0002	7439-97-6	mg/L	--	0.00003	U	0.00003	U	0.00003	U
Radionuclides*											
Radium-226	1.35	0.22	13982-63-3	pCi/L	--	0.17	U	0.58	U	-0.1	U
Radium-228	0.0502	0.64	15262-20-1	pCi/L	--	0.17	U	**2.39**		0.63	U
Thorium-228	0.1	0.097	14274-82-9	pCi/L	--	-0.013	U	0.051	U	0.06	U
Thorium-230	0.571	0.082	14269-63-7	pCi/L	--	0.031	U	0.032	U	0.038	U
Thorium-232	0.517	0.1	7440-29-1	pCi/L	--	0.011	U	0.004	U	0.008	U
Uranium-234	0.739	0.96	13966-29-5	pCi/L	--	**9**	JL	**1.76**		**0.38**	JH
Uranium-235	0.727	0.076	15117-96-1	pCi/L	--	**0.53**	J	0.018	U	0.058	U
Uranium-238	0.6	0.72	7440-61-1	pCi/L	--	**9**	JL	**1.16**		0.23	U

Notes:
B - Blank contamination with Quantitation Limit elevated.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
mg/L - milligram per liter.
MW - Monitoring Well.
pCi/L - picocurie per liter.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
RL - Reporting Limit.
SCDM - Superfund Chemical Data Matrix.
U - Analyzed but not detected.
µg/L - microgram per liter.
* Radionuclide results compared to 3x background or RL, not 2 standard deviations above the mean.
Bolding indicates detected concentration.

TABLE 2-1
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: ON-SITE RESIDENT DRINKING WATER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Contaminant	Minimum Activity/ Concentration	Maximum Activity/ Concentration	Units	Range of Detection Limits	Activity/ Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2,3)		COPC Flag (Y/N)	Rationale for Selection or Deletion
Site Groundwater	105-67-9	2,4-Dimethylphenol	0.043	0.35	µg/L	0.040 - 0.042	0.35	36	n	NO	BSL
	91-57-6	2-Methylnaphthalene	0.037	0.037	µg/L	0.019 - 0.020	0.037	3.6	n	NO	BSL
	95-48-7	2-Methylphenol	0.051	2.7	µg/L	0.045 - 0.046	2.7	93	n	NO	BSL
	3/4-CRESOL	3&4-Methylphenol	0.11	4.6	µg/L	0.036 - 0.037	4.6	150	n	NO	BSL
	98-86-2	Acetophenone	0.15	0.15	µg/L	0.024 - 0.025	0.15	190	n	NO	BSL
	120-12-7	Anthracene	0.054	0.054	µg/L	0.014 - 0.015	0.054	180	n	NO	BSL
	100-52-7	Benzaldehyde	0.28	0.28	µg/L	0.030 - 0.031	0.28	19	c*	NO	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	0.039	0.068	µg/L	0.037 - 0.039	0.068	5.6	c**	NO	BSL
	84-74-2	Di-n-butyl phthalate	0.028	0.028	µg/L	0.020 - 0.021	0.028	90	n	NO	BSL
	117-84-0	Di-n-octyl phthalate	0.054	0.24	µg/L	0.020 - 0.021	0.24	20	n	NO	BSL
	78-59-1	Isophorone	0.061	0.061	µg/L	0.025 - 0.026	0.061	78	c**	NO	BSL
	91-20-3	Naphthalene	0.022	0.057	µg/L	0.020 - 0.021	0.057	0.12	c**	NO	BSL
	108-95-2	Phenol	0.09	4.5	µg/L	0.035 - 0.036	4.5	580	n	NO	BSL
	71-55-6	1,1,1-Trichloroethane	6.9	6.9	µg/L	0.2 - 0.2	6.9	800	n	NO	BSL
	75-34-3	1,1-Dichloroethane	2	2.1	µg/L	0.2 - 0.2	2.1	2.8	c	NO	BSL
	75-35-4	1,1-Dichloroethene	0.69	89	µg/L	0.2 - 0.2	89	28	n	YES	ASL
	78-93-3	2-Butanone	4.7	4.7	µg/L	0.5 - 0.5	4.7	560	n	NO	BSL
	591-78-6	2-Hexanone	5.1	5.1	µg/L	1 - 1	5.1	3.8	n	YES	ASL
	108-10-1	4-Methyl-2-pentanone (MIBK)	10000	10000	µg/L	0.7 - 0.7	10000	630	n	YES	ASL
	67-64-1	Acetone	470	470	µg/L	2 - 2	470	1400	n	NO	BSL
	75-15-0	Carbon disulfide	47	47	µg/L	0.6 - 0.6	47	81	n	NO	BSL
	67-66-3	Chloroform	1.3	3.2	µg/L	0.2 - 0.2	3.2	0.22	c*	YES	ASL
	156-59-2	cis-1,2-Dichloroethene	0.58	13	µg/L	0.2 - 0.2	13	3.6	n	YES	ASL
	127-18-4	Tetrachloroethene	0.47	1.8	µg/L	0.3 - 0.3	1.8	4.1	n	NO	BSL
	108-88-3	Toluene	0.64	0.68	µg/L	0.2 - 0.2	0.68	110	n	NO	BSL
	79-01-6	Trichloroethene	0.88	540	µg/L	0.2 - 0.2	540	0.28	n	YES	ASL
	7429-90-5	Aluminum	10.9	492000	µg/L	10 - 10	492000	2000	n	YES	ASL
	7440-36-0	Antimony	4.22	7.72	µg/L	0.4 - 0.615	7.72	0.78	n	YES	ASL
	7440-38-2	Arsenic	0.428	165	µg/L	0.4 - 0.4	165	0.052	c*	YES	ASL
	7440-39-3	Barium	9.17	534	µg/L	NA - NA	534	380	n	YES	ASL
	7440-41-7	Beryllium	0.205	88	µg/L	0.2 - 0.2	88	2.5	n	YES	ASL
	7440-43-9	Cadmium	0.248	12.9	µg/L	0.2 - 0.4	12.9	0.92	n	YES	ASL
	7440-70-2	Calcium	331	221000	µg/L	NA - NA	221000	NUT		NO	NUT
	7440-47-3	Chromium	0.657	2330	µg/L	0.4 - 0.4	2330	0.035	c	YES	ASL
	7440-48-4	Cobalt	0.215	93.1	µg/L	0.2 - 0.2	93.1	0.6	n	YES	ASL
	7440-50-8	Copper	1.53	67.8	µg/L	1 - 1	67.8	80	n	NO	BSL
	7439-89-6	Iron	16	354000	µg/L	12 - 12	354000	1400	n	YES	ASL
	7439-92-1	Lead	0.778	0.778	µg/L	0.6 - 0.6	0.778	15	G	NO	BSL
	7439-95-4	Magnesium	172	104000	µg/L	NA - NA	104000	NUT		NO	NUT
	7439-96-5	Manganese	0.989	105000	µg/L	NA - NA	105000	43	n	YES	ASL
	7440-02-0	Nickel	0.761	484	µg/L	0.6 - 0.6	484	39	n	YES	ASL
	7440-09-7	Potassium	139	161000	µg/L	NA - NA	161000	NUT		NO	NUT
	7782-49-2	Selenium	1.65	16.1	µg/L	1.1 - 2	16.1	10	n	YES	ASL
	7440-22-4	Silver	0.552	23.1	µg/L	0.2 - 0.2	23.1	9.4	n	YES	ASL
	7440-23-5	Sodium	3430	268000	µg/L	NA - NA	268000	NUT		NO	NUT
	7440-28-0	Thallium	0.207	0.768	µg/L	0.2 - 0.2	0.768	0.02	n	YES	ASL
	7440-66-6	Zinc	2.05	826	µg/L	2 - 2	826	600	n	YES	ASL
	7439-97-6	Mercury	0.126	0.126	µg/L	0.03 - 0.03	0.126	0.063	n	YES	ASL
	15262-20-1	Radium-228(3)	2.39	2.39	pCi/L	-0.15 - 0.88	2.39	1.07E-03	c	YES	ASL
	14274-82-9	Thorium-228(3)	0.4	0.4	pCi/L	-0.018 - 0.163	0.4	1.09E-03	c	YES	ASL
	14269-63-7	Thorium-230(3)	0.37	0.37	pCi/L	-0.053 - 0.062	0.37	4.30E-04	c	YES	ASL
	7440-29-1	Thorium-232(3)	0.228	0.228	pCi/L	-0.006 - 0.045	0.228	1.06E-03	c	YES	ASL
	13966-29-5	Uranium-234(3)	0.32	1910	pCi/L	0.013 - 0.24	1910	4.29E-04	c	YES	ASL
	15117-96-1	Uranium-235(3)	0.3	89	pCi/L	-0.014 - 0.19	89	7.14E-02	c	YES	ASL
	7440-61-1	Uranium-238(3)	0.24	1940	pCi/L	0.013 - 0.23	1940	4.29E-04	c	YES	ASL

Notes/sources:
(1) Maximum detected concentration used for screening.
(2) Risk-based residential tapwater concentrations obtained from the EPA Regional Screening Level (RSL) Table (May, 2020).
(3) EPA resident tap water Preliminary Remediation Goals for Radionuclides (PRG) calculator, secular equilibrium.
Shaded cells indicate chemical identified as a COPC.
3&4-Methylphenol evaluated as cresols.
Cadmium evaluated with oral water reference dose.
Chromium evaluated as hexavalent chromium.
Manganese evaluated as non-dietary manganese.
Mercury evaluated as elemental mercury.
c = cancer based screening value set at a target risk of 1E-06.
n = noncancer based screening value set at a target hazard quotient of 0.1.
*-where: n SL < 100X c SL.
** - where n SL < 10X c SL.

ASL = above screening level.
BSL = below screening level.
COPC = Chemical of Potential Concern.
G= RSL User's Guide Section 5.
µg/L = microgram per liter.
NA = not available.
NUT = essential nutrient.
pCi/L = picocurie per liter.

TABLE 2-2
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: OFF-SITE RESIDENT DRINKING WATER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Contaminant	Modelled Surface Water Maximum Activity/ Concentration	Units	Activity/ Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2,3)		COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Water	105-67-9	2,4-Dimethylphenol	2.51E-06	µg/L	2.51E-06	36	n	NO	BSL
	91-57-6	2-Methylnaphthalene	2.65E-07	µg/L	2.65E-07	3.6	n	NO	BSL
	95-48-7	2-Methylphenol	1.93E-05	µg/L	1.93E-05	93	n	NO	BSL
	3/4-CRESOL	3&4-Methylphenol	3.30E-05	µg/L	3.30E-05	150	n	NO	BSL
	98-86-2	Acetophenone	1.07E-06	µg/L	1.07E-06	190	n	NO	BSL
	120-12-7	Anthracene	3.87E-07	µg/L	3.87E-07	180	n	NO	BSL
	100-52-7	Benzaldehyde	2.01E-06	µg/L	2.01E-06	19	c*	NO	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	4.87E-07	µg/L	4.87E-07	5.6	c**	NO	BSL
	84-74-2	Di-n-butyl phthalate	2.01E-07	µg/L	2.01E-07	90	n	NO	BSL
	117-84-0	Di-n-octyl phthalate	1.72E-06	µg/L	1.72E-06	20	n	NO	BSL
	78-59-1	Isophorone	4.37E-07	µg/L	4.37E-07	78	c**	NO	BSL
	91-20-3	Naphthalene	4.08E-07	µg/L	4.08E-07	0.12	c**	NO	BSL
	108-95-2	Phenol	3.22E-05	µg/L	3.22E-05	580	n	NO	BSL
	71-55-6	1,1,1-Trichloroethane	4.94E-05	µg/L	4.94E-05	800	n	NO	BSL
	75-34-3	1,1-Dichloroethane	1.50E-05	µg/L	1.50E-05	2.8	c	NO	BSL
	75-35-4	1,1-Dichloroethene	6.38E-04	µg/L	6.38E-04	28	n	NO	BSL
	78-93-3	2-Butanone	3.37E-05	µg/L	3.37E-05	560	n	NO	BSL
	591-78-6	2-Hexanone	3.65E-05	µg/L	3.65E-05	3.8	n	NO	BSL
	108-10-1	4-Methyl-2-pentanone (MIBK)	7.17E-02	µg/L	7.17E-02	630	n	NO	BSL
	67-64-1	Acetone	3.37E-03	µg/L	3.37E-03	1400	n	NO	BSL
	75-15-0	Carbon disulfide	3.37E-04	µg/L	3.37E-04	81	n	NO	BSL
	67-66-3	Chloroform	2.29E-05	µg/L	2.29E-05	0.22	c*	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	9.31E-05	µg/L	9.31E-05	3.6	n	NO	BSL
	127-18-4	Tetrachloroethene	1.29E-05	µg/L	1.29E-05	4.1	n	NO	BSL
	108-88-3	Toluene	4.87E-06	µg/L	4.87E-06	110	n	NO	BSL
	79-01-6	Trichloroethene	3.22E-05	µg/L	3.22E-05	0.28	n	NO	BSL
	7429-90-5	Aluminum	3.53E+00	µg/L	3.53E+00	2000	n	NO	BSL
	7440-36-0	Antimony	5.53E-05	µg/L	5.53E-05	0.78	n	NO	BSL
	7440-38-2	Arsenic	1.18E-03	µg/L	1.18E-03	0.052	c*	NO	BSL
	7440-39-3	Barium	3.83E-03	µg/L	3.83E-03	380	n	NO	BSL
	7440-41-7	Beryllium	6.31E-04	µg/L	6.31E-04	2.5	n	NO	BSL
	7440-43-9	Cadmium	9.24E-05	µg/L	9.24E-05	0.92	n	NO	BSL
	7440-70-2	Calcium	1.58E+00	µg/L	1.58E+00	NUT		NO	NUT
	7440-47-3	Chromium	1.67E-02	µg/L	1.67E-02	0.035	c	NO	BSL
	7440-48-4	Cobalt	6.67E-04	µg/L	6.67E-04	0.6	n	NO	BSL
	7440-50-8	Copper	4.86E-04	µg/L	4.86E-04	80	n	NO	BSL
	7439-89-6	Iron	2.54E+00	µg/L	2.54E+00	1400	n	NO	BSL
	7439-92-1	Lead	5.57E-06	µg/L	5.57E-06	15	G	NO	BSL
	7439-95-4	Magnesium	7.45E-01	µg/L	7.45E-01	NUT		NO	NUT
	7439-96-5	Manganese	7.52E-01	µg/L	7.52E-01	43	n	NO	BSL
	7440-02-0	Nickel	3.47E-03	µg/L	3.47E-03	39	n	NO	BSL
	7440-09-7	Potassium	1.15E+00	µg/L	1.15E+00	NUT		NO	NUT
	7782-49-2	Selenium	1.15E-04	µg/L	1.15E-04	10	n	NO	BSL
	7440-22-4	Silver	1.66E-04	µg/L	1.66E-04	9.4	n	NO	BSL
	7440-23-5	Sodium	1.92E+00	µg/L	1.92E+00	NUT		NO	NUT
	7440-28-0	Thallium	5.50E-06	µg/L	5.50E-06	0.02	n	NO	BSL
	7440-66-6	Zinc	5.92E-03	µg/L	5.92E-03	600	n	NO	BSL
	7439-97-6	Mercury	9.03E-07	µg/L	9.03E-07	0.063	n	NO	BSL
	15262-20-1	Radium-228[3]	1.71E-05	pCi/L	1.71E-05	1.07E-03	c	NO	BSL
	14274-82-9	Thorium-228[3]	2.87E-06	pCi/L	2.87E-06	1.09E-03	c	NO	BSL
	14269-63-7	Thorium-230[3]	2.65E-06	pCi/L	2.65E-06	4.30E-04	c	NO	BSL
	7440-29-1	Thorium-232[3]	1.63E-06	pCi/L	1.63E-06	1.06E-03	c	NO	BSL
	13966-29-5	Uranium-234[3]	1.37E-02	pCi/L	1.37E-02	4.29E-04	c	YES	ASL
	15117-96-1	Uranium-235[3]	6.38E-04	pCi/L	6.38E-04	7.14E-02	c	NO	BSL
	7440-61-1	Uranium-238[3]	1.39E-02	pCi/L	1.39E-02	4.29E-04	c	YES	ASL

Notes/sources:
(1) Modelled surface water concentration derived from maximum groundwater concentration used for screening (see Appendix A).
(2) Risk-based residential tapwater concentrations obtained from the EPA Regional Screening Level (RSL) Table (May, 2020).
(3) EPA resident tap water Preliminary Remediation Goals for Radionuclides (PRG) calculator, secular equilibrium.
Shaded cells indicate chemical identified as a COPC.
3&4-Methylphenol evaluated as cresols.
Cadmium evaluated with oral water reference dose.
Chromium evaluated as hexavalent chromium.
Manganese evaluated as non-dietary manganese.
Mercury evaluated as elemental mercury.
c = cancer based screening value set at a target risk of 1E-06.
n = noncancer based screening value set at a target hazard quotient of 0.1.
*-where: n SL < 100X c SL.
** - where n SL < 10X c SL.

ASL = above screening level.
BSL = below screening level.
COPC = Chemical of Potential Concern.
G= RSL User's Guide Section 5.
µg/L = microgram per liter.
NUT = essential nutrient.
pCi/L = picocurie per liter.

TABLE 2-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: ON-SITE WORKER VAPOR INTRUSION
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-51S MW-51S-20190410 4/10/2019 Field Sample		MW-52S MW-52S-20190410 4/10/2019 Field Sample		MW-53S MW-53S-20190409 4/9/2019 Field Sample		MW-53S MW-DUP1-20190409 4/9/2019 Field Duplicate		MW-54S MW-54S-20190409 4/9/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.025	U	0.024	U	0.024	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.015	U	0.014	U	0.014	U	0.014	U
	100-52-7	Benzaldehyde	µg/L	-	0.03	U	0.031	U	0.03	U	0.03	U	0.03	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.021	U	0.02	U	0.02	U	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U	**6.9**		**6.9**		0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U	**2**		**2.1**		0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	0.2	U	**89**		**88**		0.2	U
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U	1	U	1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U	**2**	U	2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	0.2	U	0.2	U	**1.3**		**1.4**		0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	0.2	U	**13**		**12**		0.2	U
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	0.3	U	**1.7**		**1.7**		0.3	U
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U	**0.68**	JQ	**0.64**	JQ	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	0.2	U	**520**		**540**		0.2	U
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
EPA GW-IA Commercial VISL = Default Vapor Intrusion Screening Levels for Groundwater to
Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
EPA VISL assumes a groundwater attenuation factor of 0.001.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
MW - Monitoring Well.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
Shaded cells indicate chemical identified as a Chemical of Potential Concern.
U - Analyzed but not detected.
µg/L = micrograms per liter.

TABLE 2-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: ON-SITE WORKER VAPOR INTRUSION
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-55S MW-55S-20190410 4/10/2019 Field Sample		MW-56S MW-56S-20190410 4/10/2019 Field Sample		MW-57S MW-57S-20190411 4/11/2019 Field Sample		MW-57S MW-DUP3-20190411 4/11/2019 Field Duplicate		MW-62S MW-62S-20190411 4/11/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.024	U	0.024	U	0.025	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.014	U	0.014	U	0.014	U	0.014	U
	100-52-7	Benzaldehyde	µg/L	-	0.031	U	0.03	U	0.031	U	0.031	U	0.03	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.02	U	0.02	U	0.021	U	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U	1	U	1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U	2	U	2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
EPA GW-IA Commercial VISL = Default Vapor Intrusion Screening Levels for Groundwater to
Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
EPA VISL assumes a groundwater attenuation factor of 0.001.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
MW - Monitoring Well.
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FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-63S MW-63S-20190411 4/11/2019 Field Sample		MW-64S MW-64S-20190409 4/9/2019 Field Sample		MW-65S MW-65S-20190412 4/12/2019 Field Sample		MW-67S MW-67S-20190411 4/11/2019 Field Sample		MW-68S MW-68S-20190410 4/10/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.019	UJL	0.02	U	0.019	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.024	U	0.025	U	0.024	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.014	U	0.014	U	0.014	U	**0.054**	JQ
	100-52-7	Benzaldehyde	µg/L	-	0.03	U	0.03	UJL	0.031	U	0.03	U	0.03	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.02	UJL	0.021	U	**0.022**	JQ	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U	1	U	1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U	2	U	2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	0.2	U	**1**	JQ	0.2	U	0.2	U
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	0.2	U	**1.7**		0.2	U	0.2	U
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U	0.03	U	0.126	JQ	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
EPA GW-IA Commercial VISL = Default Vapor Intrusion Screening Levels for Groundwater to
Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
EPA VISL assumes a groundwater attenuation factor of 0.001.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
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TABLE 2-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: ON-SITE WORKER VAPOR INTRUSION
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-69S MW-69S-20190410 4/10/2019 Field Sample		MW-69S MW-DUP2-20190410 4/10/2019 Field Duplicate		MW-70S MW-70S-20190411 4/11/2019 Field Sample		MW-71S MW-71S-20190411 4/11/2019 Field Sample		MW-72S MW-72S-20190410 4/10/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.024	U	0.024	U	0.024	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.014	U	0.014	U	0.014	U	0.014	U
	100-52-7	Benzaldehyde	µg/L	-	0.03	U	0.03	U	0.03	U	0.031	U	0.031	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U	1	U	1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U	2	U	2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
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Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
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FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-75S MW-75S-20190410 4/10/2019 Field Sample		MW-OW3 MW-OW3-20190411 4/11/2019 Field Sample		MW-OW4 MW-OW4-20190412 4/12/2019 Field Sample		MW-OW5 MW-OW5-20190412 4/12/2019 Field Sample		MW-OW6 MW-OW6-20190411 4/11/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.019	U	**0.037**	JQ	0.02	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.024	U	**0.15**	JQ	0.025	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.014	U	0.014	U	0.015	U	0.014	U
	100-52-7	Benzaldehyde	µg/L	-	0.03	U	0.03	U	**0.28**		0.031	U	0.031	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.02	U	**0.041**	JQ	**0.057**	JQ	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U	**4.7**		0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U	**5.1**		1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U	**10000**		0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U	**470**		2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U	**47**		0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	**3.2**		0.2	U	0.2	U	0.2	U	0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	**1.9**		0.2	U	0.2	U	**0.81**	JQ
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	**1.8**		0.3	U	0.3	U	0.3	U
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	**64**		0.2	U	0.2	U	**0.88**	JQ
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
EPA GW-IA Commercial VISL = Default Vapor Intrusion Screening Levels for Groundwater to
Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
EPA VISL assumes a groundwater attenuation factor of 0.001.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
MW - Monitoring Well.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
Shaded cells indicate chemical identified as a Chemical of Potential Concern.
U - Analyzed but not detected.
µg/L = micrograms per liter.

TABLE 2-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: ON-SITE WORKER VAPOR INTRUSION
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Vapor Intrusion

Exposure Point	CAS Number	Contaminant	Units	EPA GW-IA Commercial VISL	MW-OW8 MW-OW8-20190410 4/10/2019 Field Sample		MW-OW9 MW-OW9-20190411 4/11/2019 Field Sample	
Site Groundwater	91-57-6	2-Methylnaphthalene	µg/L	-	0.019	U	0.019	U
	98-86-2	Acetophenone	µg/L	-	0.024	U	0.024	U
	120-12-7	Anthracene	µg/L	-	0.014	U	0.014	U
	100-52-7	Benzaldehyde	µg/L	-	0.03	U	0.031	U
	91-20-3	Naphthalene	µg/L	20.1	0.02	U	0.02	U
	71-55-6	1,1,1-Trichloroethane	µg/L	3110	0.2	U	0.2	U
	75-34-3	1,1-Dichloroethane	µg/L	33.4	0.2	U	0.2	U
	75-35-4	1,1-Dichloroethene	µg/L	82.1	0.2	U	**0.69**	JQ
	78-93-3	2-Butanone	µg/L	941000	0.5	U	0.5	U
	591-78-6	2-Hexanone	µg/L	3450	1	U	1	U
	108-10-1	4-Methyl-2-pentanone (MIBK)	µg/L	233000	0.7	U	0.7	U
	67-64-1	Acetone	µg/L	9450000	2	U	2	U
	75-15-0	Carbon disulfide	µg/L	521	0.6	U	0.6	U
	67-66-3	Chloroform	µg/L	3.55	0.2	U	0.2	U
	156-59-2	cis-1,2-Dichloroethene	µg/L	-	0.2	U	**0.58**	JQ
	127-18-4	Tetrachloroethene	µg/L	24.2	0.3	U	**0.47**	JQ
	108-88-3	Toluene	µg/L	8070	0.2	U	0.2	U
	79-01-6	Trichloroethene	µg/L	2.18	0.2	U	**28**	
	7439-97-6	Mercury	µg/L	0.373	0.03	U	0.03	U

Notes/sources:
Chemicals were included for screening if they met the definition for volatility
(Henry's Law Constant > 1E-05 atm-m^3/mol or Vapor Pressure > 1 mm Hg).
EPA GW-IA Commercial VISL = Default Vapor Intrusion Screening Levels for Groundwater to
Indoor Air set to a target hazard quotient of 0.1 and target risk of 1E-06.
EPA VISL assumes a groundwater attenuation factor of 0.001.
J - Analyte detected below Quantitation Limit H - Biased high L - Biased low.
MW - Monitoring Well.
Q - The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.
Shaded cells indicate chemical identified as a Chemical of Potential Concern.
U - Analyzed but not detected.
µg/L = micrograms per liter.

TABLE 2-4
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: SUBSISTENCE ANGLER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Fish

Exposure Point	CAS Number	Contaminant	Modelled Fish Tissue Maximum Activity/ Concentration	Units	Activity/ Concentration Used for Screening (1)	Screening Value Carcinogen (Lifetime) (2)	Screening Value Non-Cancer (Child) (3)	COPC Flag (Y/N)	Rationale for Selection or Deletion
Fish Tissue	105-67-9	2,4-Dimethylphenol	3.83E-08	mg/kg ww	3.83E-08	-	0.439	NO	BSL
	91-57-6	2-Methylnaphthalene	4.34E-08	mg/kg ww	4.34E-08	-	0.0879	NO	BSL
	95-48-7	2-Methylphenol	1.74E-07	mg/kg ww	1.74E-07	-	1.1	NO	BSL
	3/4-CRESOL	3&4-Methylphenol	3.01E-07	mg/kg ww	3.01E-07	-	2.2	NO	BSL
	98-86-2	Acetophenone	1.43E-09	mg/kg ww	1.43E-09	-	2.2	NO	BSL
	120-12-7	Anthracene	1.55E-07	mg/kg ww	1.55E-07	-	6.59	NO	BSL
	100-52-7	Benzaldehyde	8.83E-09	mg/kg ww	8.83E-09	0.45	2.2	NO	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	8.34E-07	mg/kg ww	8.34E-07	0.13	0.439	NO	BSL
	84-74-2	Di-n-butyl phthalate	8.68E-08	mg/kg ww	8.68E-08	-	2.2	NO	BSL
	117-84-0	Di-n-octyl phthalate	1.67E-06	mg/kg ww	1.67E-06	-	0.22	NO	BSL
	78-59-1	Isophorone	2.69E-09	mg/kg ww	2.69E-09	1.88	4.39	NO	BSL
	91-20-3	Naphthalene	2.85E-08	mg/kg ww	2.85E-08	0.015	0.439	NO	BSL
	108-95-2	Phenol	1.38E-07	mg/kg ww	1.38E-07	-	6.59	NO	BSL
	71-55-6	1,1,1-Trichloroethane	1.01E-06	mg/kg ww	1.01E-06	-	43.9	NO	BSL
	75-34-3	1,1-Dichloroethane	1.06E-07	mg/kg ww	1.06E-07	0.31	4.39	NO	BSL
	75-35-4	1,1-Dichloroethene	7.53E-06	mg/kg ww	7.53E-06	-	1.1	NO	BSL
	78-93-3	2-Butanone	1.06E-07	mg/kg ww	1.06E-07	-	13.2	NO	BSL
	591-78-6	2-Hexanone	1.38E-07	mg/kg ww	1.38E-07	-	0.11	NO	BSL
	108-10-1	4-Methyl-2-pentanone (MIBK)	2.44E-04	mg/kg ww	2.44E-04	-	-	NO	BSL
	67-64-1	Acetone	1.06E-05	mg/kg ww	1.06E-05	-	19.8	NO	BSL
	75-15-0	Carbon disulfide	2.98E-06	mg/kg ww	2.98E-06	-	2.2	NO	BSL
	67-66-3	Chloroform	2.12E-07	mg/kg ww	2.12E-07	0.058	0.22	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	9.03E-07	mg/kg ww	9.03E-07	-	0.0439	NO	BSL
	127-18-4	Tetrachloroethene	1.05E-06	mg/kg ww	1.05E-06	0.85	0.132	NO	BSL
	108-88-3	Toluene	1.43E-07	mg/kg ww	1.43E-07	-	1.76	NO	BSL
	79-01-6	Trichloroethene	1.38E-07	mg/kg ww	1.38E-07	0.0388	1.76	NO	BSL
	7429-90-5	Aluminum	1.11E-02	mg/kg ww	1.11E-02	-	22	NO	BSL
	7440-36-0	Antimony	1.75E-07	mg/kg ww	1.75E-07	-	0.00879	NO	BSL
	7440-38-2	Arsenic	3.74E-06	mg/kg ww	3.74E-06	0.0012	0.00659	NO	BSL
	7440-39-3	Barium	1.21E-05	mg/kg ww	1.21E-05	-	4.39	NO	BSL
	7440-41-7	Beryllium	1.99E-06	mg/kg ww	1.99E-06	-	0.04	NO	BSL
	7440-43-9	Cadmium	2.92E-07	mg/kg ww	2.92E-07	-	0.02	NO	BSL
	7440-70-2	Calcium	5.01E-03	mg/kg ww	5.01E-03	NUT	NUT	NO	NUT
	7440-47-3	Chromium	5.28E-05	mg/kg ww	5.28E-05	0.00357	0.066	NO	BSL
	7440-48-4	Cobalt	2.11E-06	mg/kg ww	2.11E-06	-	0.007	NO	BSL
	7440-50-8	Copper	1.54E-06	mg/kg ww	1.54E-06	-	0.88	NO	BSL
	7439-89-6	Iron	8.02E-03	mg/kg ww	8.02E-03	-	15.4	NO	BSL
	7439-92-1	Lead	1.76E-08	mg/kg ww	1.76E-08	-	0.047	NO	BSL
	7439-95-4	Magnesium	2.36E-03	mg/kg ww	2.36E-03	NUT	NUT	NO	NUT
	7439-96-5	Manganese	2.38E-03	mg/kg ww	2.38E-03	-	3.08	NO	BSL
	7440-02-0	Nickel	1.10E-05	mg/kg ww	1.10E-05	-	0.44	NO	BSL
	7440-09-7	Potassium	3.65E-03	mg/kg ww	3.65E-03	NUT	NUT	NO	NUT
	7782-49-2	Selenium	3.65E-07	mg/kg ww	3.65E-07	-	0.11	NO	BSL
	7440-22-4	Silver	5.23E-07	mg/kg ww	5.23E-07	-	0.11	NO	BSL
	7440-23-5	Sodium	6.07E-03	mg/kg ww	6.07E-03	NUT	NUT	NO	NUT
	7440-28-0	Thallium	1.74E-08	mg/kg ww	1.74E-08	-	0.00022	NO	BSL
	7440-66-6	Zinc	1.87E-05	mg/kg ww	1.87E-05	-	6.59	NO	BSL
	7439-97-6	Mercury	2.85E-09	mg/kg ww	2.85E-09	-	0.0022	NO	BSL
	15262-20-1	Radium-228[(4)]	4.28E-06	pCi/g ww	4.28E-06	4.71E-04	-	NO	BSL
	14274-82-9	Thorium-228(4)	1.12E-05	pCi/g ww	1.12E-05	2.06E-03	-	NO	BSL
	14269-63-7	Thorium-230(4)	1.03E-05	pCi/g ww	1.03E-05	2.14E-04	-	NO	BSL
	7440-29-1	Thorium-232(4)	6.37E-06	pCi/g ww	6.37E-06	4.40E-04	-	NO	BSL
	13966-29-5	Uranium-234(4)	4.52E-05	pCi/g ww	4.52E-05	2.09E-04	-	NO	BSL
	15117-96-1	Uranium-235(4)	2.10E-06	pCi/g ww	2.10E-06	8.93E-04	-	NO	BSL
	7440-61-1	Uranium-238(4)	4.59E-05	pCi/g ww	4.59E-05	2.03E-04	-	NO	BSL

Notes/sources:
(1) Fish tissue concentrations derived from surface water concentrations modelled from maximum groundwater concentrations (see Table B-1).
(2) Risk-based lifetime subsistence angler cancer screening levels, EPA regional screening level (RSL) calculator.
(3) Risk-based child subsistence angler non-cancer screening levels, EPA RSL calculator).
(4) EPA recreator surface water Preliminary Remediation Goals for Radionuclides (PRG) calculator, secular equilibrium.
Shaded cells indicate chemical identified as a COPC.
3&4-Methylphenol evaluated as cresols.
Cadmium evaluated as dietary cadmium.
Chromium evaluated as hexavalent chromium.
Lead screening value calculated as the Maximum Contaminant Level (0.015 milligram/liter) * Bioconcentration Factor (3.162 liter/kilogram).
Manganese evaluated as dietary manganese.
Mercury evaluated as methylmercury.

ASL = above screening level.
BSL = below screening level.
mg/kg ww = milligrams per kilogram wet weight.
NUT = essential nutrient.
pCi/g ww = picocurie per gram wet weight.

TABLE 2-5
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN: OFF-SITE RECREATOR SURFACE WATER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Contaminant	Modelled Surface Water Maximum Activity/ Concentration	Units	Activity/ Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Water	105-67-9	2,4-Dimethylphenol	2.51E-06	µg/L	2.51E-06	1120	n	NO	BSL
	91-57-6	2-Methylnaphthalene	2.65E-07	µg/L	2.65E-07	46.9	n	NO	BSL
	95-48-7	2-Methylphenol	1.93E-05	µg/L	1.93E-05	3300	n	NO	BSL
	3/4-CRESOL	3&4-Methylphenol	3.30E-05	µg/L	3.30E-05	3600	n	NO	BSL
	98-86-2	Acetophenone	1.07E-06	µg/L	1.07E-06	8020	n	NO	BSL
	120-12-7	Anthracene	3.87E-07	µg/L	3.87E-07	1940	n	NO	BSL
	100-52-7	Benzaldehyde	2.01E-06	µg/L	2.01E-06	1260	c**	NO	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	4.87E-07	µg/L	4.87E-07	549	c**	NO	BSL
	84-74-2	Di-n-butyl phthalate	2.01E-07	µg/L	2.01E-07	1200	n	NO	BSL
	117-84-0	Di-n-octyl phthalate	1.72E-06	µg/L	1.72E-06	1040	n	NO	BSL
	78-59-1	Isophorone	4.37E-07	µg/L	4.37E-07	5170	c**	NO	BSL
	91-20-3	Naphthalene	4.08E-07	µg/L	4.08E-07	8.16	c*	NO	BSL
	108-95-2	Phenol	3.22E-05	µg/L	3.22E-05	23800	n	NO	BSL
	71-55-6	1,1,1-Trichloroethane	4.94E-05	µg/L	4.94E-05	101000	n	NO	BSL
	75-34-3	1,1-Dichloroethane	1.50E-05	µg/L	1.50E-05	707	c*	NO	BSL
	75-35-4	1,1-Dichloroethene	6.38E-04	µg/L	6.38E-04	2830	n	NO	BSL
	78-93-3	2-Butanone	3.37E-05	µg/L	3.37E-05	58400	n	NO	BSL
	591-78-6	2-Hexanone	3.65E-05	µg/L	3.65E-05	412	n	NO	BSL
	108-10-1	4-Methyl-2-pentanone (MIBK)	7.17E-02	µg/L	7.17E-02	NBA		NO	NBA
	67-64-1	Acetone	3.37E-03	µg/L	3.37E-03	90300	n	NO	BSL
	75-15-0	Carbon disulfide	3.37E-04	µg/L	3.37E-04	5900	n	NO	BSL
	67-66-3	Chloroform	2.29E-05	µg/L	2.29E-05	124	c**	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	9.31E-05	µg/L	9.31E-05	116	n	NO	BSL
	127-18-4	Tetrachloroethene	1.29E-05	µg/L	1.29E-05	146	n	NO	BSL
	108-88-3	Toluene	4.87E-06	µg/L	4.87E-06	2660	n	NO	BSL
	79-01-6	Trichloroethene	3.22E-05	µg/L	3.22E-05	26.5	n	NO	BSL
	7429-90-5	Aluminum	3.53E+00	µg/L	3.53E+00	98500	n	NO	BSL
	7440-36-0	Antimony	5.53E-05	µg/L	5.53E-05	30.6	n	NO	BSL
	7440-38-2	Arsenic	1.18E-03	µg/L	1.18E-03	4.67	c**	NO	BSL
	7440-39-3	Barium	3.83E-03	µg/L	3.83E-03	11800	n	NO	BSL
	7440-41-7	Beryllium	6.31E-04	µg/L	6.31E-04	24.2	n	NO	BSL
	7440-43-9	Cadmium	9.24E-05	µg/L	9.24E-05	25.2	n	NO	BSL
	7440-70-2	Calcium	1.58E+00	µg/L	1.58E+00	NUT		NO	NUT
	7440-47-3	Chromium	1.67E-02	µg/L	1.67E-02	0.531	c	NO	BSL
	7440-48-4	Cobalt	6.67E-04	µg/L	6.67E-04	30.5	n	NO	BSL
	7440-50-8	Copper	4.86E-04	µg/L	4.86E-04	3940	n	NO	BSL
	7439-89-6	Iron	2.54E+00	µg/L	2.54E+00	68900	n	NO	BSL
	7439-92-1	Lead	5.57E-06	µg/L	5.57E-06	15	G	NO	BSL
	7439-95-4	Magnesium	7.45E-01	µg/L	7.45E-01	NUT		NO	NUT
	7439-96-5	Manganese	7.52E-01	µg/L	7.52E-01	1070	n	NO	BSL
	7440-02-0	Nickel	3.47E-03	µg/L	3.47E-03	1640	n	NO	BSL
	7440-09-7	Potassium	1.15E+00	µg/L	1.15E+00	NUT		NO	NUT
	7782-49-2	Selenium	1.15E-04	µg/L	1.15E-04	492	n	NO	BSL
	7440-22-4	Silver	1.66E-04	µg/L	1.66E-04	289	n	NO	BSL
	7440-23-5	Sodium	1.92E+00	µg/L	1.92E+00	NUT		NO	NUT
	7440-28-0	Thallium	5.50E-06	µg/L	5.50E-06	0.985	n	NO	BSL
	7440-66-6	Zinc	5.92E-03	µg/L	5.92E-03	30100	n	NO	BSL
	7439-97-6	Mercury	9.03E-07	µg/L	9.03E-07	17.7	n	NO	BSL
	15262-20-1	Radium-228(3)	1.71E-05	pCi/L	1.71E-05	5.82	c	NO	BSL
	14274-82-9	Thorium-228(3)	2.87E-06	pCi/L	2.87E-06	25.9	c	NO	BSL
	14269-63-7	Thorium-230(3)	2.65E-06	pCi/L	2.65E-06	2.47	c	NO	BSL
	7440-29-1	Thorium-232(3)	1.63E-06	pCi/L	1.63E-06	5.41	c	NO	BSL
	13966-29-5	Uranium-234(3)	1.37E-02	pCi/L	1.37E-02	2.42	c	NO	BSL
	15117-96-1	Uranium-235(3)	6.38E-04	pCi/L	6.38E-04	10.6	c	NO	BSL
	7440-61-1	Uranium-238(3)	1.39E-02	pCi/L	1.39E-02	2.36	c	NO	BSL

Notes/sources:
(1) Modelled surface water concentration derived from maximum groundwater concentration (see Appendix A).
(2) Site-specific Recreator Regional Screening Levels (RSLs).
(3) EPA recreator surface water Preliminary Remediation Goals for Radionuclides (PRG) calculator, secular equilibrium.
3&4-Methylphenol evaluated as cresols.
Cadmium evaluated with oral water reference dose.
Chromium evaluated as hexavalent chromium.
Manganese evaluated as non-dietary manganese.
Mercury evaluated as mercuric chloride.
c = cancer based screening value set at a target risk of 1E-06.
n = noncancer based screening value set at a target hazard quotient of 0.1.
*-where: n SL < 100X c SL.
** - where n SL < 10X c SL.

ASL = above screening level.
BSL = below screening level.
COPC = Chemical of Potential Concern.
G= RSL User's Guide Section 5.
µg/L = microgram per liter.
NUT = essential nutrient.
pCi/L = picocurie per liter.

TABLE 3-1
RISK CHARACTERIZATION: ON-SITE RESIDENT DRINKING WATER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Chemical of Potential Concern	Maximum Concentration/ Activity	Units	Location of Maximum	Tap Water RSLs[1]/PRGs[2]		Hazard Quotient/Index	ILCR
				Non-Cancer	Cancer		
1,1-Dichloroethene	89	µg/L	MW-53S	280	--	0.3	--
2-Hexanone	5.1	µg/L	MW-OW4	38	--	0.1	--
4-Methyl-2-pentanone (MIBK)	10000	µg/L	MW-OW4	6300	--	2	--
Chloroform	3.2	µg/L	MW-75S	97	0.22	0.03	1E-05
cis-1,2-Dichloroethene	13	µg/L	MW-53S	36	--	0.4	--
Trichloroethene	540	µg/L	MW-53S	2.8	0.49	193	1E-03
Aluminum	492000	µg/L	MW-OW4	20000	--	25	--
Antimony	7.72	µg/L	MW-67S	7.8	--	1	--
Arsenic	165	µg/L	MW-67S	6	0.052	28	3E-03
Barium	534	µg/L	MW-OW5	3800	--	0.1	--
Beryllium	88	µg/L	MW-OW4	25	--	4	--
Cadmium	12.9	µg/L	MW-OW4	9.2	--	1	--
Chromium	2330	µg/L	MW-OW4	44	0.035	53	7E-02
Cobalt	93.1	µg/L	MW-OW4	6	--	16	--
Iron	354000	µg/L	MW-OW4	14000	--	25	--
Manganese	105000	µg/L	MW-OW4	430	--	244	--
Nickel	484	µg/L	MW-OW4	390	--	1	--
Selenium	16.1	µg/L	MW-OW3	100	--	0.2	--
Silver	23.1	µg/L	MW-OW4	94	--	0.2	--
Thallium	0.768	µg/L	MW-OW6	0.2	--	4	--
Zinc	826	µg/L	MW-OW4	6000	--	0.1	--
Mercury	0.126	µg/L	MW-67S	0.63	--	0.2	--
Radium-228	2.39	pCi/L	MW-OW8	--	0.00107	--	2E-03
Thorium-228	0.4	pCi/L	MW-67S	--	0.00109	--	4E-04
Thorium-230	0.37	pCi/L	MW-67S	--	0.00043	--	9E-04
Thorium-232	0.228	pCi/L	MW-67S	--	0.00106	--	2E-04
Uranium-234	1910	pCi/L	MW-OW4	--	0.000429	--	1E+00
Uranium-235	89	pCi/L	MW-OW4	--	0.0714	--	1E-03
Uranium-238	1940	pCi/L	MW-OW4	--	0.000429	--	1E+00
					Total	***597***	***1E+00***

Notes:
[1]EPA Tap Water Regional Screening Levels (RSL) (May 2020), Hazard Quotient = 1, Target Cancer Risk = 1E-06.
[2]EPA Resident Preliminary Remediation Goals (PRGs) for Radionuclides (PRG Calculator), Target Cancer Risk = 1E-06.
Shaded cells indicate Hazard Quotient > 1.0 or ILCR>1E-06.
ILCR = Incremental Lifetime Cancer Risk
ILCR is bounded by 1; calculations > 1 are presented as 1E+00.
Risk estimates are presented to 1 significant figure.
Cadmium evaluated with oral water reference dose.
Chromium evaluated as hexavalent chromium.
Manganese evaluated as non-dietary manganese.
Mercury evaluated as elemental mercury.
µg/L = microgram per liter.
pCi/L = picocurie per liter.

TABLE 3-2
RISK CHARACTERIZATION: OFF-SITE RESIDENT DRINKING WATER
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Chemical of Potential Concern	Maximum Concentration/ Activity	Units	Tap Water RSLs[1]/PRGs[2]		Hazard Quotient/Index	ILCR
			Non-Cancer	Cancer		
Uranium-234	1.37E-02	pCi/L	--	4.29E-04	--	3E-05
Uranium-238	1.39E-02	pCi/L	--	4.29E-04	--	3E-05
				Total	**--**	***6E-05***

Notes:
[1]EPA Tap Water Regional Screening Levels (RSL) (May 2020), Hazard Quotient = 1, Target Cancer Risk = 1E-06.
[2]EPA Resident Preliminary Remediation Goals (PRGs) for Radionuclides (PRG Calculator), Target Cancer Risk = 1E-06.
ILCR = Incremental Lifetime Cancer Risk.
Shaded cells indicate Hazard Quotient > 1.0 or ILCR > 1E-06
Chromium evaluated as hexavalent chromium
Risk and hazard estimates are presented to one significant figure.
pCi/L = picocurie per liter

TABLE 3-3
RISK CHARACTERIZATION: ON-SITE WORKER VAPOR INTRUSION
FANSTEEL METALS/FMRI
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Location	Chemical of Potential Concern	Concentration (µg/L)	Commercial VISL[1] (µg/L)		Hazard Quotient/Index	ILCR
			Non-Cancer	Cancer		
MW-53S	1,1-Dichloroethene	89	821	--	0.1	--
	Trichloroethene	540	21.8	7.43	25	7E-05
				Total	***25***	***7E-05***
MW-OW3	Trichloroethene	64	21.8	7.43	3	9E-06
				Total	***3***	***9E-06***
MW-OW9	Trichloroethene	28	21.8	7.43	1	4E-06
				Total	***1***	***4E-06***

Notes:
[1]Default Commercial Vapor Intrusion Screening Levels (VISL) for Groundwater to Indoor Air set to a target hazard quotient of 1 and target cancer risk of 1E-06.

ILCR = Incremental Lifetime Cancer Risk
Shaded cells indicate Hazard Quotient > 1.0 or Incremental Lifetime Cancer Risk >1E-06.
Risk estimates are presented to one significant figure.
µg/L = microgram per liter.

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APPENDICES

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APPENDIX A

Surface Water Concentration Estimation

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Table A-1
Groundwater to Surface Water Dilution Factor
Fansteel Metals/FMRI
Muskogee, Muskogee County, Oklahoma

Equation:

$$DFgwsw = \left[1 + \frac{Qsw}{K \times i \times \delta sw \times Wgwsw}\right]^{-1}$$

Parameter	Definition/Units	Comment	Value
DFgwsw	***dilution factor for groundwater to surface water (unitless)***	***Calculated***	***139561***
Qsw	surface water flow rate (cm3/s)	Mean of means from 2004 to 2019 # USGS 07194500 Arkansas River near Muskogee, OK	758445498
K	aquifer hydraulic conductivity (cm/sec)	Midpoint of range value from site Darcy's Law Flux Calculations (9/2020) - North Section	0.025
i	hydraulic gradient (cm/cm)	Average value from site Darcy's Law Flux Calculations (9/2020) - North Section	0.033
δsw	thickness of groundwater plume at surface water interface (cm)	Input value (average) from site Darcy's Law Flux Calculations (9/2020) - North Section	195
Wgwsw	width of groundwater plume at surface water interface (cm)	Value from site Darcy's Law Flux Calculations (9/2020) - North Section	34138

Equation from North Carolina Department of Environmental Quality (NCDEQ). 2020. *Risk Evaluation Equations and Calculations* . May 2020.

Table A-2
Estimated Surface Water Concentrations
Fansteel Metals/FMRI
Muskogee, Muskogee County, Oklahoma

Analyte	Units	Groundwater Maximum	Surface Water Maximum[a]
SVOC			
2,4-Dimethylphenol	µg/L	0.35	2.51E-06
2-Methylnaphthalene	µg/L	0.037	2.65E-07
2-Methylphenol	µg/L	2.7	1.93E-05
3&4-Methylphenol	µg/L	4.6	3.30E-05
Acetophenone	µg/L	0.15	1.07E-06
Anthracene	µg/L	0.054	3.87E-07
Benzaldehyde	µg/L	0.28	2.01E-06
Bis(2-ethylhexyl)phthalate	µg/L	0.068	4.87E-07
Di-n-butyl phthalate	µg/L	0.028	2.01E-07
Di-n-octyl phthalate	µg/L	0.24	1.72E-06
Isophorone	µg/L	0.061	4.37E-07
Naphthalene	µg/L	0.057	4.08E-07
Phenol	µg/L	4.5	3.22E-05
VOC			
1,1,1-Trichloroethane	µg/L	6.9	4.94E-05
1,1-Dichloroethane	µg/L	2.1	1.50E-05
1,1-Dichloroethene	µg/L	89	6.38E-04
2-Butanone	µg/L	4.7	3.37E-05
2-Hexanone	µg/L	5.1	3.65E-05
4-Methyl-2-pentanone (MIBK)	µg/L	10000	7.17E-02
Acetone	µg/L	470	3.37E-03
Carbon disulfide	µg/L	47	3.37E-04
Chloroform	µg/L	3.2	2.29E-05
cis-1,2-Dichloroethene	µg/L	13	9.31E-05
Tetrachloroethene	µg/L	1.8	1.29E-05
Toluene	µg/L	0.68	4.87E-06
Trichloroethene	µg/L	540	3.87E-03
Metals			
Aluminum	mg/L	492	3.53E-03
Antimony	mg/L	0.00772	5.53E-08
Arsenic	mg/L	0.165	1.18E-06
Barium	mg/L	0.534	3.83E-06
Beryllium	mg/L	0.088	6.31E-07
Cadmium	mg/L	0.0129	9.24E-08
Calcium	mg/L	221	1.58E-03
Chromium	mg/L	2.33	1.67E-05
Cobalt	mg/L	0.0931	6.67E-07
Copper	mg/L	0.0678	4.86E-07
Iron	mg/L	354	2.54E-03
Lead	mg/L	0.000778	5.57E-09
Magnesium	mg/L	104	7.45E-04
Manganese	mg/L	105	7.52E-04
Nickel	mg/L	0.484	3.47E-06
Potassium	mg/L	161	1.15E-03
Selenium	mg/L	0.0161	1.15E-07
Silver	mg/L	0.0231	1.66E-07
Sodium	mg/L	268	1.92E-03
Thallium	mg/L	0.000768	5.50E-09
Zinc	mg/L	0.826	5.92E-06
Mercury	mg/L	0.000126	9.03E-10
Radionuclides			
Radium-228	pCi/L	2.39	1.71E-05
Thorium-228	pCi/L	0.4	2.87E-06
Thorium-230	pCi/L	0.37	2.65E-06
Thorium-232	pCi/L	0.228	1.63E-06
Uranium-234	pCi/L	1910	1.37E-02
Uranium-235	pCi/L	89	6.38E-04
Uranium-238	pCi/L	1940	1.39E-02
Total Uranium	µg/L	5869.11	6.27E-02

[a]Calculated by dividing maximum groundwater concentration by dilution factor. See Table A-1 for calculation.

APPENDIX B

Fish Concentration Estimation

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Table B-1
Bioaccumulation Factors and Estimated Fish Concentrations
Fansteel Metals/FMRI
Muskogee, Muskogee County, Oklahoma

	Surface Water		Bioconcentration Factor		Fish Tissue	
Analyte	**Maximum[a]**	**Units**	**Value (L water/kg ww tissue)**	**Reference**	**Maximum[b]**	**Units**
SVOC						
2,4-Dimethylphenol	2.50787E-06	µg/L	15.29	EpiSuite Version 4.1; 2020	3.83453E-05	µg/kg ww
2-Methylnaphthalene	2.65118E-07	µg/L	163.6	EpiSuite Version 4.1; 2020	4.33732E-05	µg/kg ww
2-Methylphenol	1.93464E-05	µg/L	8.987	EpiSuite Version 4.1; 2020	0.000173866	µg/kg ww
3&4-Methylphenol	3.29606E-05	µg/L	9.124	EpiSuite Version 4.1; 2020	0.000300732	µg/kg ww
Acetophenone	1.0748E-06	µg/L	1.332	EpiSuite Version 4.1; 2020	1.43163E-06	µg/kg ww
Anthracene	3.86928E-07	µg/L	401	EpiSuite Version 4.1; 2020	0.000155158	µg/kg ww
Benzaldehyde	2.00629E-06	µg/L	4.401	EpiSuite Version 4.1; 2020	8.8297E-06	µg/kg ww
Bis(2-ethylhexyl)phthalate	4.87243E-07	µg/L	1712	EpiSuite Version 4.1; 2020	0.00083416	µg/kg ww
Di-n-butyl phthalate	2.00629E-07	µg/L	432.6	EpiSuite Version 4.1; 2020	8.67923E-05	µg/kg ww
Di-n-octyl phthalate	1.71968E-06	µg/L	973.9	EpiSuite Version 4.1; 2020	0.001674798	µg/kg ww
Isophorone	4.37086E-07	µg/L	6.147	EpiSuite Version 4.1; 2020	2.68677E-06	µg/kg ww
Naphthalene	4.08424E-07	µg/L	69.88	EpiSuite Version 4.1; 2020	2.85407E-05	µg/kg ww
Phenol	3.2244E-05	µg/L	4.269	EpiSuite Version 4.1; 2020	0.00013765	µg/kg ww
VOC						
1,1,1-Trichloroethane	4.94408E-05	µg/L	20.41	EpiSuite Version 4.1; 2020	0.001009087	µg/kg ww
1,1-Dichloroethane	1.50472E-05	µg/L	7.048	EpiSuite Version 4.1; 2020	0.000106053	µg/kg ww
1,1-Dichloroethene	0.000637715	µg/L	11.81	EpiSuite Version 4.1; 2020	0.007531416	µg/kg ww
2-Butanone	3.36771E-05	µg/L	3.162	EpiSuite Version 4.1; 2020	0.000106487	µg/kg ww
2-Hexanone	3.65432E-05	µg/L	3.78	EpiSuite Version 4.1; 2020	0.000138133	µg/kg ww
4-Methyl-2-pentanone (MIBK)	0.071653387	µg/L	3.399	EpiSuite Version 4.1; 2020	0.243549861	µg/kg ww
Acetone	0.003367709	µg/L	3.162	EpiSuite Version 4.1; 2020	0.010648696	µg/kg ww
Carbon disulfide	0.000336771	µg/L	8.851	EpiSuite Version 4.1; 2020	0.002980759	µg/kg ww
Chloroform	2.29291E-05	µg/L	9.264	EpiSuite Version 4.1; 2020	0.000212415	µg/kg ww
cis-1,2-Dichloroethene	9.31494E-05	µg/L	9.696	EpiSuite Version 4.1; 2020	0.000903177	µg/kg ww
Tetrachloroethene	1.28976E-05	µg/L	81.34	EpiSuite Version 4.1; 2020	0.001049092	µg/kg ww
Toluene	4.87243E-06	µg/L	29.39	EpiSuite Version 4.1; 2020	0.000143201	µg/kg ww
Trichloroethene	0.003869283	µg/L	18.35	EpiSuite Version 4.1; 2020	0.071001341	µg/kg ww
Metals						
Aluminum	0.003525347	mg/L	3.162	EpiSuite Version 4.1; 2020	0.011147146	mg/kg ww
Antimony	5.53164E-08	mg/L	3.162	EpiSuite Version 4.1; 2020	1.74911E-07	mg/kg ww
Arsenic	1.18228E-06	mg/L	3.162	EpiSuite Version 4.1; 2020	3.73837E-06	mg/kg ww
Barium	3.82629E-06	mg/L	3.162	EpiSuite Version 4.1; 2020	1.20987E-05	mg/kg ww
Beryllium	6.3055E-07	mg/L	3.162	EpiSuite Version 4.1; 2020	1.9938E-06	mg/kg ww
Cadmium	9.24329E-08	mg/L	3.162	EpiSuite Version 4.1; 2020	2.92273E-07	mg/kg ww
Calcium	0.00158354	mg/L	3.162	EpiSuite Version 4.1; 2020	0.005007153	mg/kg ww
Chromium	1.66952E-05	mg/L	3.162	EpiSuite Version 4.1; 2020	5.27903E-05	mg/kg ww
Cobalt	6.67093E-07	mg/L	3.162	EpiSuite Version 4.1; 2020	2.10935E-06	mg/kg ww
Copper	4.8581E-07	mg/L	3.162	EpiSuite Version 4.1; 2020	1.53613E-06	mg/kg ww
Iron	0.00253653	mg/L	3.162	EpiSuite Version 4.1; 2020	0.008020508	mg/kg ww
Lead	5.57463E-09	mg/L	3.162	EpiSuite Version 4.1; 2020	1.7627E-08	mg/kg ww
Magnesium	0.000745195	mg/L	3.162	EpiSuite Version 4.1; 2020	0.002356307	mg/kg ww
Manganese	0.000752361	mg/L	3.162	EpiSuite Version 4.1; 2020	0.002378964	mg/kg ww
Nickel	3.46802E-06	mg/L	3.162	EpiSuite Version 4.1; 2020	1.09659E-05	mg/kg ww
Potassium	0.00115362	mg/L	3.162	EpiSuite Version 4.1; 2020	0.003647745	mg/kg ww
Selenium	1.15362E-07	mg/L	3.162	EpiSuite Version 4.1; 2020	3.64774E-07	mg/kg ww
Silver	1.65519E-07	mg/L	3.162	EpiSuite Version 4.1; 2020	5.23372E-07	mg/kg ww
Sodium	0.001920311	mg/L	3.162	EpiSuite Version 4.1; 2020	0.006072023	mg/kg ww
Thallium	5.50298E-09	mg/L	3.162	EpiSuite Version 4.1; 2020	1.74004E-08	mg/kg ww
Zinc	5.91857E-06	mg/L	3.162	EpiSuite Version 4.1; 2020	1.87145E-05	mg/kg ww
Mercury	9.02833E-10	mg/L	3.162	EpiSuite Version 4.1; 2020	2.85476E-09	mg/kg ww
Radionuclides						
Radium-228	1.71252E-05	pCi/L	250	maximum; IAEA, 2010	0.00428129	pCi/kg ww
Thorium-228	2.86614E-06	pCi/L	3900	maximum; IAEA, 2010	0.011177928	pCi/kg ww
Thorium-230	2.65118E-06	pCi/L	3900	maximum; IAEA, 2010	0.010339584	pCi/kg ww
Thorium-232	1.6337E-06	pCi/L	3900	maximum; IAEA, 2010	0.006371419	pCi/kg ww
Uranium-234	0.013685797	pCi/L	3.3	maximum; IAEA, 2010	0.04516313	pCi/kg ww
Uranium-235	0.000637715	pCi/L	3.3	maximum; IAEA, 2010	0.00210446	pCi/kg ww
Uranium-238	0.013900757	pCi/L	3.3	maximum; IAEA, 2010	0.045872498	pCi/kg ww
Total Uranium	0.0626607	µg/L	3.3	maximum; IAEA, 2010	0.206780309	µg/kg ww

[a]Calculated, see Table A-2.
[b]Fish tissue concentration (whole body weight weight) = surface water concentration times BCF
kg - kilogram.
L - Liter.
mg/L - milligrams per liter.
pCi/L - picoCurie per liter.
µg/L - micrograms per liter.
ww - wet weight.

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APPENDIX C

Resident Radionuclide Preliminary Remediation Goals

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Site-specific
Resident Tap Water Inputs

Variable	Resident Tap Water Default Value	Form-input Value
$CF_{res\text{-}produce}$ (contaminated plant fraction) unitless	1	1
Soil type	Default	Default
$DFA_{res\text{-}adj}$ (age-adjusted immersion factor - resident) hr	6104	6104
ED_{res} (exposure duration - resident) yr	26	26
$ED_{res\text{-}a}$ (exposure duration - resident adult) yr	20	20
$ED_{res\text{-}c}$ (exposure duration - resident child) yr	6	6
$EF_{res\text{-}a}$ (exposure frequency - resident adult) day/yr	350	350
$EF_{res\text{-}c}$ (exposure frequency - resident child) day/yr	350	350
$ET_{res\text{-}a}$ (exposure time - resident adult) hr/day	24	24
$ET_{res\text{-}c}$ (exposure time - resident child) hr/day	24	24
$EV_{res\text{-}a}$ (bathing events per day - resident adult) event/day	1	1
$EV_{res\text{-}c}$ (bathing events per day - resident child) event/day	1	1
F (irrigation period) unitless	0.25	0.25
$IFA_{res\text{-}adj}$ (age-adjusted inhalation factor - resident) m^3	161000	161000
I_f (interception fraction) unitless	0.42	0.42
$IFW_{res\text{-}adj}$ (adjusted intake factor - resident) L-yr/kg-day	19138	19138
$IRA_{res\text{-}a}$ (inhalation rate - resident adult) m^3/day	20	20
$IRA_{res\text{-}c}$ (inhalation rate - resident child) m^3/day	10	10
I_r (irrigation rate) L/m^2-day	3.62	3.62
$IRW_{res\text{-}a}$ (water intake rate - resident adult) L/day	2.5	2.5
$IRW_{res\text{-}c}$ (water intake rate - resident child) L/day	0.78	0.78
K (volatilization factor of Andelman) L/m^3	0.5	0.5
$Lambda_{HL}$ (soil leaching rate) 1/day	0.000027	0.000027
P (area density for root zone) kg/m^2	240	240
T (translocation factor) unitless	1	1
$ET_{event\text{-}res\text{-}a}$ (duration of bathing event - adult) hr/event	0.71	0.71
t_b (long term deposition and buildup) day	10950	10950
$ET_{event\text{-}res\text{-}c}$ (duration of bathing event - child) hr/event	0.54	0.54
TR (target cancer risk) unitless	0.000001	0.000001
t_v (above ground exposure time) day	60	60
t_w (weathering half-life) day	14	14
Y_v (plant yield - wet) kg/m^2	2	2

Site-specific
Resident PRGs for Tap Water - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/L)	Inhalation PRG TR=1.0E-06 (pCi/L)	Immersion PRG TR=1.0E-06 (pCi/L)	Produce Consumption PRG TR=1.0E-06 (pCi/g)	Total PRG TR=1.0E-06 (pCi/L)
Secular Equilibrium PRG for Ra-226	*1.71E-02*	*4.41E-04*	*8.54E+04*	-	*4.30E-04*
Secular Equilibrium PRG for Ra-228	*3.90E-02*	*1.10E-03*	*6.27E+04*	-	*1.07E-03*
Secular Equilibrium PRG for Th-228	*1.74E-01*	*1.10E-03*	*9.73E+04*	-	*1.09E-03*
Secular Equilibrium PRG for Th-230	*1.66E-02*	*4.41E-04*	*8.54E+04*	-	*4.30E-04*
Secular Equilibrium PRG for Th-232	*3.63E-02*	*1.10E-03*	*6.27E+04*	-	*1.06E-03*
Secular Equilibrium PRG for U-234	*1.62E-02*	*4.41E-04*	*8.54E+04*	-	*4.29E-04*
Secular Equilibrium PRG for U-235	*7.14E-02*	-	*2.59E+05*	-	*7.14E-02*
Secular Equilibrium PRG for U-238	*1.58E-02*	*4.41E-04*	*8.41E+04*	-	*4.29E-04*

APPENDIX D

Surface Water Recreator Screening Levels

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Site-specific

Recreator Equation Inputs for Surface Water

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Surface Water Default Value	Form-input Value
BW_{0-2} (body weight) kg	15	15
BW_{2-6} (body weight) kg	15	15
BW_{6-16} (body weight) kg	80	80
BW_{16-30} (body weight) kg	80	80
BW_{a} (body weight - adult) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
$DFW_{rec-adj}$ (age-adjusted dermal factor) cm^2-event/kg	0	164098
$DFWM_{rec-adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	0	514902.667
ED_{rec} (exposure duration - recreator) years	26	26
ED_{0-2} (exposure duration) years	2	2
ED_{2-6} (exposure duration) years	4	4
ED_{6-16} (exposure duration) years	10	10
ED_{16-30} (exposure duration) years	10	10
ED_{rec-a} (exposure duration - adult) years	20	20
EF_{rec-w} (exposure frequency) days/year	0	22
EF_{2-6} (exposure frequency) days/year	0	22
EF_{6-16} (exposure frequency) days/year	0	22
EF_{16-30} (exposure frequency) days/year	0	22
EF_{rec-a} (adult exposure frequency) days/year	0	22
ET_{0-2} (exposure time) hours/event	0	2
ET_{2-6} (exposure time) hours/event	0	2
ET_{6-16} (exposure time) hours/event	0	2
ET_{16-30} (exposure time) hours/event	0	2
ET_{rec-a} (adult exposure time) hours/event	0	2
EV_{0-2} (events) events/day	0	1
EV_{2-6} (events) events/day	0	1
EV_{6-16} (events) events/day	0	1
EV_{16-30} (events) events/day	0	1
EV_{rec-a} (adult) events/day	0	1
THQ (target hazard quotient) unitless	0.1	0.1
$IFW_{rec-adj}$ (age-adjusted water intake rate) L/kg	0	3.322
$IFWM_{rec-adj}$ (mutagenic age-adjusted water intake rate) L/kg	0	13.852
IRW_{0-2} (water intake rate) L/hour	0.12	0.12
IRW_{2-6} (water intake rate) L/hour	0.12	0.12
IRW_{6-16} (water intake rate) L/hour	0.124	0.124
IRW_{16-30} (water intake rate) L/hour	0.0985	0.0985
IRW_{rec} (water intake rate - adult) L/day	0.11	0.11
IRW_{rec-a} (water intake rate - adult) L/hr	0.11	0.11
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm^2	6365	6365
SA_{2-6} (skin surface area) cm^2	6365	6365
SA_{6-16} (skin surface area) cm^2	19652	19652
SA_{16-30} (skin surface area) cm^2	19652	19652
SA_{rec} (skin surface area - adult) cm^2	19652	19652
SA_{rec-a} (skin surface area - adult) cm^2	19652	19652
Apparent thickness of stratum corneum (cm)	0.001	0.001
TR (target risk) unitless	0.000001	0.000001

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Site-specific

Recreator Regional Screening Levels (RSL) for Surface Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W
Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Acenaphthene	83-32-9	No	Yes	Organics	-		0.0600	I
Acephate	30560-19-1	No	No	Organics	-		0.0012	O
Acetaldehyde	75-07-0	No	Yes	Organics	-		-	
Acetochlor	34256-82-1	No	No	Organics	-		0.0200	I
Acetone	67-64-1	No	Yes	Organics	-		0.9000	I
Acetone Cyanohydrin	75-86-5	No	No	Organics	-		-	
Acetonitrile	75-05-8	No	Yes	Organics	-		-	
Acetophenone	98-86-2	No	Yes	Organics	-		0.1000	I
Acetylaminofluorene, 2-	53-96-3	No	No	Organics	3.8000	C	-	
Acrolein	107-02-8	No	Yes	Organics	-		0.0005	I
Acrylamide	79-06-1	Yes	No	Organics	0.5000	I	0.0020	I
Acrylic Acid	79-10-7	No	Yes	Organics	-		0.5000	I
Acrylonitrile	107-13-1	No	Yes	Organics	0.5400	I	0.0400	A
Adiponitrile	111-69-3	No	No	Organics	-		-	
Alachlor	15972-60-8	No	No	Organics	0.0560	C	0.0100	I
Aldicarb	116-06-3	No	No	Organics	-		0.0010	I
Aldicarb Sulfone	1646-88-4	No	No	Organics	-		0.0010	I
Aldrin	309-00-2	No	Yes	Organics	17.0000	I	0.0000	I
Allyl Alcohol	107-18-6	No	Yes	Organics	-		0.0050	I
Allyl Chloride	107-05-1	No	Yes	Organics	0.0210	C	-	
Aluminum	7429-90-5	No	No	Inorganics	-		1.0000	P
Aluminum Phosphide	20859-73-8	No	No	Inorganics	-		0.0004	I
Aluminum metaphosphate	13776-88-0	No	No	Inorganics	-		48.6000	P
Ametryn	834-12-8	No	No	Organics	-		0.0090	I
Aminobiphenyl, 4-	92-67-1	No	No	Organics	21.0000	C	-	
Aminophenol, m-	591-27-5	No	No	Organics	-		0.0800	P
Aminophenol, o-	95-55-6	No	No	Organics	-		0.0040	X
Aminophenol, p-	123-30-8	No	No	Organics	-		0.0200	P
Amitraz	33089-61-1	No	No	Organics	-		0.0025	I
Ammonium Perchlorate	7790-98-9	No	No	Inorganics	-		0.0007	I
Ammonium Sulfamate	7773-06-0	No	No	Inorganics	-		0.2000	I
Ammonium polyphosphate	68333-79-9	No	No	Inorganics	-		48.6000	P
Amyl Alcohol, tert-	75-85-4	No	Yes	Organics	-		-	
Aniline	62-53-3	No	No	Organics	0.0057	I	0.0070	P
Anthracene	120-12-7	No	Yes	Organics	-		0.3000	I
Anthraquinone, 9,10-	84-65-1	No	No	Organics	0.0400	P	0.0020	X
Antimony (metallic)	7440-36-0	No	No	Inorganics	-		0.0004	I
Antimony Pentoxide	1314-60-9	No	No	Inorganics	-		0.0005	H
Antimony Potassium Tartrate	11071-15-1	No	No	Organics	-		-	
Antimony Tetroxide	1332-81-6	No	No	Inorganics	-		0.0004	H
Antimony Trichloride	10025-91-9	No	No	Inorganics	-		-	
Antimony Trioxide	1309-64-4	No	No	Inorganics	-		-	
Aroclor 1016	12674-11-2	No	Yes	Organics	0.0700	G	0.0001	I
Aroclor 1221	11104-28-2	No	Yes	Organics	2.0000	G	-	
Aroclor 1232	11141-16-5	No	Yes	Organics	2.0000	G	-	
Aroclor 1242	53469-21-9	No	Yes	Organics	2.0000	G	-	
Aroclor 1248	12672-29-6	No	Yes	Organics	2.0000	G	-	
Aroclor 1254	11097-69-1	No	Yes	Organics	2.0000	G	0.0000	I
Aroclor 1260	11096-82-5	No	Yes	Organics	2.0000	G	-	
Aroclor 5460	11126-42-4	No	Yes	Organics	-		0.0006	X
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.5000	I	0.0003	I
Arsine	7784-42-1	No	No	Inorganics	-		0.0000	C
Asulam	3337-71-1	No	No	Organics	-		0.0360	O

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Atrazine	1912-24-9	No	No	Organics	0.2300	C	0.0350	I
Auramine	492-80-8	No	No	Organics	0.8800	C	-	
Avermectin B1	65195-55-3	No	No	Organics	-		0.0004	I
Azinphos-methyl	86-50-0	No	No	Organics	-		0.0030	A
Azobenzene	103-33-3	No	Yes	Organics	0.1100	I	-	
Azodicarbonamide	123-77-3	No	No	Organics	-		1.0000	P
Barium	7440-39-3	No	No	Inorganics	-		0.2000	I
Benfluralin	1861-40-1	No	Yes	Organics	-		0.0050	O
Benomyl	17804-35-2	No	No	Organics	-		0.0500	I
Bensulfuron-methyl	83055-99-6	No	No	Organics	-		0.2000	I
Bentazon	25057-89-0	No	No	Organics	-		0.0300	I
Benz[a]anthracene	56-55-3	Yes	Yes	Organics	0.1000	E	-	
Benzaldehyde	100-52-7	No	Yes	Organics	0.0040	P	0.1000	I
Benzene	71-43-2	No	Yes	Organics	0.0550	I	0.0040	I
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	No	No	Organics	0.1000	X	0.0003	X
Benzenethiol	108-98-5	No	Yes	Organics	-		0.0010	P
Benzidine	92-87-5	Yes	No	Organics	230.0000	I	0.0030	I
Benzo(j)fluoranthene	205-82-3	No	No	Organics	1.2000	C	-	
Benzo[a]pyrene	50-32-8	Yes	No	Organics	1.0000	I	0.0003	I
Benzo[b]fluoranthene	205-99-2	Yes	No	Organics	0.1000	E	-	
Benzo[k]fluoranthene	207-08-9	Yes	No	Organics	0.0100	E	-	
Benzoic Acid	65-85-0	No	No	Organics	-		4.0000	I
Benzotrichloride	98-07-7	No	Yes	Organics	13.0000	I	-	
Benzyl Alcohol	100-51-6	No	No	Organics	-		0.1000	P
Benzyl Chloride	100-44-7	No	Yes	Organics	0.1700	I	0.0020	P
Beryllium and compounds	7440-41-7	No	No	Inorganics	-		0.0020	I
Bifenox	42576-02-3	No	No	Organics	-		0.0090	P
Biphenthrin	82657-04-3	No	No	Organics	-		0.0150	I
Biphenyl, 1,1'-	92-52-4	No	Yes	Organics	0.0080	I	0.5000	I
Bis(2-chloro-1-methylethyl) ether	108-60-1	No	Yes	Organics	-		0.0400	I
Bis(2-chloroethoxy)methane	111-91-1	No	No	Organics	-		0.0030	P
Bis(2-chloroethyl)ether	111-44-4	No	Yes	Organics	1.1000	I	-	
Bis(2-ethylhexyl)phthalate	117-81-7	No	No	Organics	0.0140	I	0.0200	I
Bis(chloromethyl)ether	542-88-1	No	Yes	Organics	220.0000	I	-	
Bisphenol A	80-05-7	No	No	Organics	-		0.0500	I
Boron And Borates Only	7440-42-8	No	No	Inorganics	-		0.2000	I
Boron Trichloride	10294-34-5	No	Yes	Inorganics	-		2.0000	P
Boron Trifluoride	7637-07-2	No	Yes	Inorganics	-		0.0400	C
Bromate	15541-45-4	No	No	Inorganics	0.7000	I	0.0040	I
Bromo-2-chloroethane, 1-	107-04-0	No	Yes	Organics	2.0000	X	-	
Bromo-3-fluorobenzene, 1-	1073-06-9	No	Yes	Organics	-		0.0003	X
Bromo-4-fluorobenzene, 1-	460-00-4	No	Yes	Organics	-		0.0003	X
Bromobenzene	108-86-1	No	Yes	Organics	-		0.0080	I
Bromochloromethane	74-97-5	No	Yes	Organics	-		-	
Bromodichloromethane	75-27-4	No	Yes	Organics	0.0620	I	0.0200	I
Bromoform	75-25-2	No	Yes	Organics	0.0079	I	0.0200	I
Bromomethane	74-83-9	No	Yes	Organics	-		0.0014	I
Bromophos	2104-96-3	No	Yes	Organics	-		0.0050	H
Bromopropane, 1-	106-94-5	No	Yes	Organics	-		-	
Bromoxynil	1689-84-5	No	No	Organics	0.1030	O	0.0150	O
Bromoxynil Octanoate	1689-99-2	No	Yes	Organics	0.1030	O	0.0150	O
Butadiene, 1,3-	106-99-0	No	Yes	Organics	0.6000	C	-	
Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6	No	No	Organics	-		0.0300	O
Butanol, N-	71-36-3	No	Yes	Organics	-		0.1000	I
Butyl Benzyl Phthalate	85-68-7	No	No	Organics	0.0019	P	0.2000	I
Butyl Formate, tert-	762-75-4	No	Yes	Organics	-		-	
Butyl alcohol, sec-	78-92-2	No	Yes	Organics	-		2.0000	P
Butylate	2008-41-5	No	Yes	Organics	-		0.0500	I
Butylated hydroxyanisole	25013-16-5	No	No	Organics	0.0002	C	-	
Butylated hydroxytoluene	128-37-0	No	No	Organics	0.0036	P	0.3000	P
Butylbenzene, n-	104-51-8	No	Yes	Organics	-		0.0500	P

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Butylbenzene, sec-	135-98-8	No	Yes	Organics	-		0.1000	X
Butylbenzene, tert-	98-06-6	No	Yes	Organics	-		0.1000	X
Butylphthalyl Butylglycolate	85-70-1	No	No	Organics	-		1.0000	I
Cacodylic Acid	75-60-5	No	No	Organics	-		0.0200	A
Cadmium (Water)	7440-43-9	No	No	Inorganics	-		0.0005	I
Calcium Cyanide	592-01-8	No	No	Inorganics	-		0.0010	I
Calcium pyrophosphate	7790-76-3	No	No	Inorganics	-		48.6000	P
Caprolactam	105-60-2	No	No	Organics	-		0.5000	I
Captafol	2425-06-1	No	No	Organics	0.1500	C	0.0020	I
Captan	133-06-2	No	No	Organics	0.0023	C	0.1300	I
Carbaryl	63-25-2	No	No	Organics	-		0.1000	I
Carbofuran	1563-66-2	No	No	Organics	-		0.0050	I
Carbon Disulfide	75-15-0	No	Yes	Organics	-		0.1000	I
Carbon Tetrachloride	56-23-5	No	Yes	Organics	0.0700	I	0.0040	I
Carbonyl Sulfide	463-58-1	No	Yes	Organics	-		-	
Carbosulfan	55285-14-8	No	No	Organics	-		0.0100	I
Carboxin	5234-68-4	No	No	Organics	-		0.1000	I
Ceric oxide	1306-38-3	No	No	Inorganics	-		-	
Chloral	75-87-6	No	Yes	Organics	-		-	
Chloral Hydrate	302-17-0	No	Yes	Organics	-		0.1000	I
Chloramben	133-90-4	No	No	Organics	-		0.0150	I
Chloranil	118-75-2	No	No	Organics	0.4030	H	-	
Chlordane (technical mixture)	12789-03-6	No	Yes	Organics	0.3500	I	0.0005	I
Chlordecone (Kepone)	143-50-0	No	No	Organics	10.0000	I	0.0003	I
Chlorfenvinphos	470-90-6	No	No	Organics	-		0.0007	A
Chlorimuron, Ethyl-	90982-32-4	No	No	Organics	-		0.0900	O
Chlorine	7782-50-5	No	Yes	Inorganics	-		0.1000	I
Chlorine Dioxide	10049-04-4	No	Yes	Inorganics	-		0.0300	I
Chlorite (Sodium Salt)	7758-19-2	No	No	Inorganics	-		0.0300	I
Chloro-1,1-difluoroethane, 1-	75-68-3	No	Yes	Organics	-		-	
Chloro-1,3-butadiene, 2-	126-99-8	No	Yes	Organics	-		0.0200	H
Chloro-2-methylaniline HCl, 4-	3165-93-3	No	No	Organics	0.4600	H	-	
Chloro-2-methylaniline, 4-	95-69-2	No	No	Organics	0.1000	P	0.0030	X
Chloroacetaldehyde, 2-	107-20-0	No	Yes	Organics	0.2700	X	-	
Chloroacetophenone, 2-	532-27-4	No	No	Organics	-		-	
Chloroaniline, p-	106-47-8	No	No	Organics	0.2000	P	0.0040	I
Chlorobenzene	108-90-7	No	Yes	Organics	-		0.0200	I
Chlorobenzene sulfonic acid, p-	98-66-8	No	No	Organics	-		0.1000	X
Chlorobenzilate	510-15-6	No	No	Organics	0.1100	C	0.0200	I
Chlorobenzoic Acid, p-	74-11-3	No	No	Organics	-		0.0300	X
Chlorobenzotrifluoride, 3-nitro-4-	121-17-5	No	Yes	Organics	-		-	
Chlorobenzotrifluoride, 4-	98-56-6	No	Yes	Organics	-		0.0030	P
Chlorobutane, 1-	109-69-3	No	Yes	Organics	-		0.0400	P
Chlorodifluoromethane	75-45-6	No	Yes	Organics	-		-	
Chloroethanol, 2-	107-07-3	No	Yes	Organics	-		0.0200	P
Chloroform	67-66-3	No	Yes	Organics	0.0310	C	0.0100	I
Chloromethane	74-87-3	No	Yes	Organics	-		-	
Chloromethyl Methyl Ether	107-30-2	No	Yes	Organics	2.4000	C	-	
Chloronaphthalene, Beta-	91-58-7	No	Yes	Organics	-		0.0800	I
Chloronitrobenzene, o-	88-73-3	No	No	Organics	0.3000	P	0.0030	P
Chloronitrobenzene, p-	100-00-5	No	No	Organics	0.0600	P	0.0007	P
Chlorophenol, 2-	95-57-8	No	Yes	Organics	-		0.0050	I
Chloropicrin	76-06-2	No	Yes	Organics	-		-	
Chlorothalonil	1897-45-6	No	No	Organics	0.0170	C	0.0150	I
Chlorotoluene, o-	95-49-8	No	Yes	Organics	-		0.0200	I
Chlorotoluene, p-	106-43-4	No	Yes	Organics	-		0.0200	X
Chlorozotocin	54749-90-5	No	No	Organics	240.0000	C	-	
Chlorpropham	101-21-3	No	No	Organics	-		0.0500	O
Chlorpyrifos	2921-88-2	No	No	Organics	-		0.0010	A
Chlorpyrifos Methyl	5598-13-0	No	No	Organics	-		0.0100	H
Chlorsulfuron	64902-72-3	No	No	Organics	-		0.0500	O

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Chlorthal-dimethyl	1861-32-1	No	No	Organics	-		0.0100	I
Chlorthiophos	60238-56-4	No	No	Organics	-		0.0008	H
Chromium(III), Insoluble Salts	16065-83-1	No	No	Inorganics	-		1.5000	I
Chromium(VI)	18540-29-9	Yes	No	Inorganics	0.5000	C	0.0030	I
Chrysene	218-01-9	Yes	No	Organics	0.0010	E	-	
Clofentezine	74115-24-5	No	No	Organics	-		0.0130	I
Cobalt	7440-48-4	No	No	Inorganics	-		0.0003	P
Copper	7440-50-8	No	No	Inorganics	-		0.0400	H
Copper Cyanide	544-92-3	No	No	Inorganics	-		0.0050	I
Cresol, m-	108-39-4	No	No	Organics	-		0.0500	I
Cresol, o-	95-48-7	No	No	Organics	-		0.0500	I
Cresol, p-	106-44-5	No	No	Organics	-		0.1000	A
Cresol, p-chloro-m-	59-50-7	No	No	Organics	-		0.1000	A
Cresols	1319-77-3	No	No	Organics	-		0.1000	A
Crotonaldehyde, trans-	123-73-9	No	Yes	Organics	1.9000	H	0.0010	P
Cumene	98-82-8	No	Yes	Organics	-		0.1000	I
Cupferron	135-20-6	No	No	Organics	0.2200	C	-	
Cyanazine	21725-46-2	No	No	Organics	0.8400	H	0.0020	H
Cyanide (CN-)	57-12-5	No	Yes	Inorganics	-		0.0006	I
Cyanogen	460-19-5	No	Yes	Inorganics	-		0.0010	I
Cyanogen Bromide	506-68-3	No	Yes	Inorganics	-		0.0900	I
Cyanogen Chloride	506-77-4	No	Yes	Inorganics	-		0.0500	I
Cyclohexane	110-82-7	No	Yes	Organics	-		-	
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	No	No	Organics	0.0200	X	0.0200	X
Cyclohexanone	108-94-1	No	Yes	Organics	-		5.0000	I
Cyclohexene	110-83-8	No	Yes	Organics	-		0.0050	P
Cyclohexylamine	108-91-8	No	Yes	Organics	-		0.2000	I
Cyclopentadiene	542-92-7	No	Yes	Organics	-		-	
Cyfluthrin	68359-37-5	No	No	Organics	-		0.0250	I
Cyhalothrin	68085-85-8	No	No	Organics	-		0.0010	O
Cyromazine	66215-27-8	No	No	Organics	-		0.5000	O
DDD, p,p`- (DDD)	72-54-8	No	No	Organics	0.2400	I	0.0000	X
DDE, p,p'-	72-55-9	No	Yes	Organics	0.3400	I	0.0003	X
DDT	50-29-3	No	No	Organics	0.3400	I	0.0005	I
Dalapon	75-99-0	No	No	Organics	-		0.0300	I
Daminozide	1596-84-5	No	No	Organics	0.0180	C	0.1500	I
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	No	No	Organics	0.0007	I	0.0070	I
Decane	124-18-5	No	Yes	Organics	-		-	
Demeton	8065-48-3	No	No	Organics	-		0.0000	I
Di(2-ethylhexyl)adipate	103-23-1	No	No	Organics	0.0012	I	0.6000	I
Diallate	2303-16-4	No	No	Organics	0.0610	H	-	
Diammonium phosphate	7783-28-0	No	No	Inorganics	-		48.6000	P
Diazinon	333-41-5	No	No	Organics	-		0.0007	A
Dibenz[a,h]anthracene	53-70-3	Yes	No	Organics	1.0000	E	-	
Dibenzo(a,e)pyrene	192-65-4	No	No	Organics	12.0000	C	-	
Dibenzofuran	132-64-9	No	Yes	Organics	-		0.0010	X
Dibenzothiophene	132-65-0	No	Yes	Organics	-		0.0100	X
Dibromo-3-chloropropane, 1,2-	96-12-8	Yes	Yes	Organics	0.8000	P	0.0002	P
Dibromobenzene, 1,3-	108-36-1	No	Yes	Organics	-		0.0004	X
Dibromobenzene, 1,4-	106-37-6	No	Yes	Organics	-		0.0100	I
Dibromochloromethane	124-48-1	No	Yes	Organics	0.0840	I	0.0200	I
Dibromoethane, 1,2-	106-93-4	No	Yes	Organics	2.0000	I	0.0090	I
Dibromomethane (Methylene Bromide)	74-95-3	No	Yes	Organics	-		-	
Dibutyl Phthalate	84-74-2	No	No	Organics	-		0.1000	I
Dibutyltin Compounds	NA	No	No	Organics	-		0.0003	P
Dibutyltin dichloride	683-18-1	No	Yes	Organics	-		-	
Dicalcium phosphate	7757-93-9	No	No	Inorganics	-		48.6000	P
Dicamba	1918-00-9	No	No	Organics	-		0.0300	I
Dichloro-2-butene, 1,4-	764-41-0	No	Yes	Organics	-		-	

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Dichloro-2-butene, cis-1,4-	1476-11-5	No	Yes	Organics	-		-	
Dichloro-2-butene, trans-1,4-	110-57-6	No	Yes	Organics	-		-	
Dichloroacetic Acid	79-43-6	No	No	Organics	0.0500	I	0.0040	I
Dichlorobenzene, 1,2-	95-50-1	No	Yes	Organics	-		0.0900	I
Dichlorobenzene, 1,3-	541-73-1	No	Yes	Organics	-		-	
Dichlorobenzene, 1,4-	106-46-7	No	Yes	Organics	0.0054	C	0.0700	A
Dichlorobenzidine, 3,3'-	91-94-1	No	No	Organics	0.4500	I	-	
Dichlorobenzophenone, 4,4'-	90-98-2	No	No	Organics	-		0.0090	X
Dichlorobenzotrifluoride, 3,4-	328-84-7	No	Yes	Organics	-		-	
Dichlorodifluoromethane	75-71-8	No	Yes	Organics	-		0.2000	I
Dichlorodiisopropyl ether, 2,2'-	39638-32-9	No	Yes	Organics	-		-	
Dichloroethane, 1,1-	75-34-3	No	Yes	Organics	0.0057	C	0.2000	P
Dichloroethane, 1,2-	107-06-2	No	Yes	Organics	0.0910	I	0.0060	X
Dichloroethylene, 1,1-	75-35-4	No	Yes	Organics	-		0.0500	I
Dichloroethylene, 1,2-cis-	156-59-2	No	Yes	Organics	-		0.0020	I
Dichloroethylene, 1,2-trans-	156-60-5	No	Yes	Organics	-		0.0200	I
Dichlorophenol, 2,4-	120-83-2	No	No	Organics	-		0.0030	I
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	No	No	Organics	-		0.0100	I
Dichloropropane, 1,2-	78-87-5	No	Yes	Organics	0.0370	P	0.0400	P
Dichloropropane, 1,3-	142-28-9	No	Yes	Organics	-		0.0200	P
Dichloropropanol, 2,3-	616-23-9	No	No	Organics	-		0.0030	I
Dichloropropene, 1,3-	542-75-6	No	Yes	Organics	0.1000	I	0.0300	I
Dichlorvos	62-73-7	No	No	Organics	0.2900	I	0.0005	I
Dicrotophos	141-66-2	No	No	Organics	-		0.0000	O
Dicyclopentadiene	77-73-6	No	Yes	Organics	-		0.0800	P
Dieldrin	60-57-1	No	No	Organics	16.0000	I	0.0001	I
Diethanolamine	111-42-2	No	No	Organics	-		0.0020	P
Diethyl Phthalate	84-66-2	No	No	Organics	-		0.8000	I
Diethyl-meta-Toluamide, N,N (DEET)	134-62-3	No	No	Organics	-		-	
Diethylene Glycol Monobutyl Ether	112-34-5	No	No	Organics	-		0.0300	P
Diethylene Glycol Monoethyl Ether	111-90-0	No	No	Organics	-		0.0600	P
Diethylformamide	617-84-5	No	Yes	Organics	-		0.0010	P
Diethylstilbestrol	56-53-1	No	No	Organics	350.0000	C	-	
Difenzoquat	43222-48-6	No	No	Organics	-		0.0830	O
Diflubenzuron	35367-38-5	No	No	Organics	-		0.0200	I
Difluoroethane, 1,1-	75-37-6	No	Yes	Organics	-		-	
Difluoropropane, 2,2-	420-45-1	No	Yes	Organics	-		-	
Dihydrosafrole	94-58-6	No	Yes	Organics	0.0440	C	-	
Diisopropyl Ether	108-20-3	No	Yes	Organics	-		-	
Diisopropyl Methylphosphonate	1445-75-6	No	Yes	Organics	-		0.0800	I
Dimagnesium phosphate	7782-75-4	No	No	Inorganics	-		48.6000	P
Dimethipin	55290-64-7	No	No	Organics	-		0.0218	O
Dimethoate	60-51-5	No	No	Organics	-		0.0022	O
Dimethoxybenzidine, 3,3'-	119-90-4	No	No	Organics	1.6000	P	-	
Dimethyl methylphosphonate	756-79-6	No	No	Organics	0.0017	P	0.0600	P
Dimethylamino azobenzene [p-]	60-11-7	No	No	Organics	4.6000	C	-	
Dimethylaniline HCl, 2,4-	21436-96-4	No	No	Organics	0.5800	H	-	
Dimethylaniline, 2,4-	95-68-1	No	No	Organics	0.2000	P	0.0020	X
Dimethylaniline, N,N-	121-69-7	No	Yes	Organics	0.0270	P	0.0020	I
Dimethylbenz(a)anthracene, 7,12-	57-97-6	Yes	No	Organics	250.0000	C	-	
Dimethylbenzidine, 3,3'-	119-93-7	No	No	Organics	11.0000	P	-	
Dimethylformamide	68-12-2	No	Yes	Organics	-		0.1000	P
Dimethylhydrazine, 1,1-	57-14-7	No	Yes	Organics	-		0.0001	X
Dimethylhydrazine, 1,2-	540-73-8	No	Yes	Organics	550.0000	C	-	
Dimethylphenol, 2,4-	105-67-9	No	No	Organics	-		0.0200	I
Dimethylphenol, 2,6-	576-26-1	No	No	Organics	-		0.0006	I
Dimethylphenol, 3,4-	95-65-8	No	No	Organics	-		0.0010	I
Dimethylphthalate	131-11-3	No	No	Organics	-		-	
Dimethylterephthalate	120-61-6	No	Yes	Organics	-		0.1000	I
Dimethylvinylchloride	513-37-1	No	Yes	Organics	0.0450	C	-	
Dinitro-o-cresol, 4,6-	534-52-1	No	No	Organics	-		0.0001	X

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	No	No	Organics	-		0.0020	I
Dinitrobenzene, 1,2-	528-29-0	No	No	Organics	-		0.0001	P
Dinitrobenzene, 1,3-	99-65-0	No	No	Organics	-		0.0001	I
Dinitrobenzene, 1,4-	100-25-4	No	No	Organics	-		0.0001	P
Dinitrophenol, 2,4-	51-28-5	No	No	Organics	-		0.0020	I
Dinitrotoluene Mixture, 2,4/2,6-	NA	No	No	Organics	0.6800	I	-	
Dinitrotoluene, 2,4-	121-14-2	No	No	Organics	0.3100	C	0.0020	I
Dinitrotoluene, 2,6-	606-20-2	No	No	Organics	1.5000	P	0.0003	X
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	No	No	Organics	-		0.0001	X
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	No	No	Organics	-		0.0001	X
Dinitrotoluene, Technical grade	25321-14-6	No	No	Organics	0.4500	X	0.0009	X
Dinoseb	88-85-7	No	No	Organics	-		0.0010	I
Dioxane, 1,4-	123-91-1	No	Yes	Organics	0.1000	I	0.0300	I
Diphenamid	957-51-7	No	No	Organics	-		0.0300	I
Diphenyl Ether	101-84-8	No	Yes	Organics	-		-	
Diphenyl Sulfone	127-63-9	No	No	Organics	-		0.0008	X
Diphenylamine	122-39-4	No	No	Organics	-		0.1000	O
Diphenylhydrazine, 1,2-	122-66-7	No	No	Organics	0.8000	I	-	
Dipotassium phosphate	7758-11-4	No	No	Inorganics	-		48.6000	P
Diquat	85-00-7	No	No	Organics	-		0.0022	I
Direct Black 38	1937-37-7	No	No	Organics	7.4000	C	-	
Direct Blue 6	2602-46-2	No	No	Organics	7.4000	C	-	
Direct Brown 95	16071-86-6	No	No	Organics	6.7000	C	-	
Disodium phosphate	7558-79-4	No	No	Inorganics	-		48.6000	P
Disulfoton	298-04-4	No	No	Organics	-		0.0000	I
Dithiane, 1,4-	505-29-3	No	Yes	Organics	-		0.0100	I
Diundecyl Phthalate	3648-20-2	No	Yes	Organics	-		-	
Diuron	330-54-1	No	No	Organics	-		0.0020	I
Dodine	2439-10-3	No	No	Organics	-		0.0200	O
EPTC	759-94-4	No	Yes	Organics	-		0.0500	O
Endosulfan	115-29-7	No	Yes	Organics	-		0.0060	I
Endosulfan Sulfate	1031-07-8	No	No	Organics	-		0.0060	P
Endothall	145-73-3	No	No	Organics	-		0.0200	I
Endrin	72-20-8	No	No	Organics	-		0.0003	I
Epichlorohydrin	106-89-8	No	Yes	Organics	0.0099	I	0.0060	P
Epoxybutane, 1,2-	106-88-7	No	Yes	Organics	-		-	
Ethanol, 2-(2-methoxyethoxy)-	111-77-3	No	No	Organics	-		0.0400	P
Ethephon	16672-87-0	No	No	Organics	-		0.0050	I
Ethion	563-12-2	No	No	Organics	-		0.0005	I
Ethoxyethanol Acetate, 2-	111-15-9	No	Yes	Organics	-		0.1000	P
Ethoxyethanol, 2-	110-80-5	No	Yes	Organics	-		0.0900	P
Ethyl Acetate	141-78-6	No	Yes	Organics	-		0.9000	I
Ethyl Acrylate	140-88-5	No	Yes	Organics	-		0.0050	P
Ethyl Chloride	75-00-3	No	Yes	Organics	-		-	
Ethyl Ether	60-29-7	No	Yes	Organics	-		0.2000	I
Ethyl Methacrylate	97-63-2	No	Yes	Organics	-		-	
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	No	No	Organics	-		0.0000	I
Ethylbenzene	100-41-4	No	Yes	Organics	0.0110	C	0.1000	I
Ethylene Cyanohydrin	109-78-4	No	No	Organics	-		0.0700	P
Ethylene Diamine	107-15-3	No	Yes	Organics	-		0.0900	P
Ethylene Glycol	107-21-1	No	No	Organics	-		2.0000	I
Ethylene Glycol Monobutyl Ether	111-76-2	No	No	Organics	-		0.1000	I
Ethylene Oxide	75-21-8	Yes	Yes	Organics	0.3100	C	-	
Ethylene Thiourea	96-45-7	No	No	Organics	0.0450	C	0.0001	I
Ethyleneimine	151-56-4	No	Yes	Organics	65.0000	C	-	
Ethylphthalyl Ethyl Glycolate	84-72-0	No	No	Organics	-		3.0000	I
Fenamiphos	22224-92-6	No	No	Organics	-		0.0003	I
Fenpropathrin	39515-41-8	No	No	Organics	-		0.0250	I
Fenvalerate	51630-58-1	No	No	Organics	-		0.0250	I
Fluometuron	2164-17-2	No	No	Organics	-		0.0130	I
Fluoranthene	206-44-0	No	No	Organics	-		0.0400	I

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Fluorene	86-73-7	No	Yes	Organics	-		0.0400	I
Fluoride	16984-48-8	No	No	Inorganics	-		0.0400	C
Fluorine (Soluble Fluoride)	7782-41-4	No	No	Inorganics	-		0.0600	I
Fluorobenzene	462-06-6	No	Yes	Organics	-		-	
Fluridone	59756-60-4	No	No	Organics	-		0.0800	I
Flurprimidol	56425-91-3	No	No	Organics	-		0.0400	O
Flusilazole	85509-19-9	No	No	Organics	-		0.0020	O
Flutolanil	66332-96-5	No	No	Organics	-		0.5000	O
Fluvalinate	69409-94-5	No	No	Organics	-		0.0100	I
Folpet	133-07-3	No	No	Organics	-		0.0900	O
Fomesafen	72178-02-0	No	No	Organics	-		0.0025	O
Fonofos	944-22-9	No	No	Organics	-		0.0020	I
Formaldehyde	50-00-0	No	Yes	Organics	0.0210	C	0.2000	I
Formic Acid	64-18-6	No	Yes	Organics	-		0.9000	P
Fosetyl-AL	39148-24-8	No	No	Organics	-		2.5000	O
Furan	110-00-9	No	Yes	Organics	-		0.0010	I
Furazolidone	67-45-8	No	No	Organics	3.8000	H	-	
Furfural	98-01-1	No	Yes	Organics	-		0.0030	I
Furium	531-82-8	No	No	Organics	1.5000	C	-	
Furmecyclox	60568-05-0	No	No	Organics	0.0300	I	-	
Gadolinium	7440-54-2	No	No	Inorganics	-		-	
Glufosinate, Ammonium	77182-82-2	No	No	Organics	-		0.0060	O
Glutaraldehyde	111-30-8	No	No	Organics	-		0.1000	A
Glycidyl	765-34-4	No	Yes	Organics	-		0.0004	I
Glyphosate	1071-83-6	No	No	Organics	-		0.1000	I
Guanidine	113-00-8	No	Yes	Organics	-		0.0100	X
Guanidine Chloride	50-01-1	No	No	Organics	-		0.0200	P
Guanidine Nitrate	506-93-4	No	No	Organics	-		0.0300	X
Haloxyfop, Methyl	69806-40-2	No	No	Organics	-		0.0001	I
Heptachlor	76-44-8	No	Yes	Organics	4.5000	I	0.0005	I
Heptachlor Epoxide	1024-57-3	No	Yes	Organics	9.1000	I	0.0000	I
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	No	Yes	Organics	3.9000	W	0.0000	W
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	No	Yes	Organics	1300.0000	W	0.0000	W
Heptanal, n-	111-71-7	No	Yes	Organics	-		-	
Heptane, N-	142-82-5	No	Yes	Organics	-		0.0003	X
Hexabromobenzene	87-82-1	No	Yes	Organics	-		0.0020	I
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	No	No	Organics	-		0.0002	I
Hexachlorobenzene	118-74-1	No	Yes	Organics	1.6000	I	0.0008	I
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	No	Yes	Organics	3.9000	W	0.0000	W
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	No	Yes	Organics	3.9000	W	0.0000	W
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	No	Yes	Organics	3.9000	W	0.0000	W
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	No	Yes	Organics	3900.0000	W	0.0000	W
Hexachlorobutadiene	87-68-3	No	Yes	Organics	0.0780	I	0.0010	P
Hexachlorocyclohexane, Alpha-	319-84-6	No	No	Organics	6.3000	I	0.0080	A
Hexachlorocyclohexane, Beta-	319-85-7	No	No	Organics	1.8000	I	-	
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	No	No	Organics	1.1000	C	0.0003	I
Hexachlorocyclohexane, Technical	608-73-1	No	No	Organics	1.8000	I	-	
Hexachlorocyclopentadiene	77-47-4	No	Yes	Organics	-		0.0060	I
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6	No	No	Organics	13000.0000	W	0.0000	W
Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	No	No	Organics	6200.0000	I	-	
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	No	Yes	Organics	13000.0000	W	0.0000	W
Hexachloroethane	67-72-1	No	Yes	Organics	0.0400	I	0.0007	I
Hexachlorophene	70-30-4	No	No	Organics	-		0.0003	I
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	No	No	Organics	0.0800	I	0.0040	I
Hexamethylene Diisocyanate, 1,6-	822-06-0	No	Yes	Organics	-		-	
Hexamethylene diisocyanate biuret	4035-89-6	No	No	Organics	-		-	
Hexamethylene diisocyanate isocyanurate	3779-63-3	No	No	Organics	-		-	
Hexamethylphosphoramide	680-31-9	No	No	Organics	-		0.0004	P
Hexane, Commercial	NA	No	Yes	Organics	-		-	
Hexane, N-	110-54-3	No	Yes	Organics	-		-	
Hexanedioic Acid	124-04-9	No	No	Organics	-		2.0000	P

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	No	Yes	Organics	0.0095	P	0.0700	P
Hexanone, 2-	591-78-6	No	Yes	Organics	-		0.0050	I
Hexazinone	51235-04-2	No	No	Organics	-		0.0330	I
Hexythiazox	78587-05-0	No	No	Organics	-		0.0250	I
HpCDD, 1,2,3,4,6,7,8,-	35822-46-9	No	Yes	Organics	1300.0000	W	0.0000	W
HpCDF, 1,2,3,4,7,8,9-	55673-89-7	No	Yes	Organics	1300.0000	W	0.0000	W
HxCDD, 1,2,3,6,7,8-	57653-85-7	No	No	Organics	13000.0000	W	0.0000	W
HxCDD, 1,2,3,7,8,9-	19408-74-3	No	No	Organics	13000.0000	W	0.0000	W
HxCDF, 1,2,3,6,7,8-	57117-44-9	No	Yes	Organics	13000.0000	W	0.0000	W
HxCDF, 1,2,3,7,8,9-	72918-21-9	No	No	Organics	13000.0000	W	0.0000	W
HxCDF, 2,3,4,6,7,8-	60851-34-5	No	No	Organics	13000.0000	W	0.0000	W
Hydramethylnon	67485-29-4	No	No	Organics	-		0.0170	O
Hydrazine	302-01-2	No	Yes	Inorganics	3.0000	I	-	
Hydrazine Sulfate	10034-93-2	No	No	Inorganics	3.0000	I	-	
Hydrogen Chloride	7647-01-0	No	Yes	Inorganics	-		-	
Hydrogen Cyanide	74-90-8	No	Yes	Inorganics	-		0.0006	I
Hydrogen Fluoride	7664-39-3	No	Yes	Inorganics	-		0.0400	C
Hydrogen Sulfide	7783-06-4	No	Yes	Inorganics	-		-	
Hydroquinone	123-31-9	No	No	Organics	0.0600	P	0.0400	P
Imazalil	35554-44-0	No	No	Organics	0.0611	O	0.0025	O
Imazaquin	81335-37-7	No	No	Organics	-		0.2500	I
Imazethapyr	81335-77-5	No	No	Organics	-		2.5000	O
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	No	Organics	0.1000	E	-	
Iodine	7553-56-2	No	No	Inorganics	-		0.0100	A
Iprodione	36734-19-7	No	No	Organics	-		0.0400	I
Iron	7439-89-6	No	No	Inorganics	-		0.7000	P
Isobutyl Alcohol	78-83-1	No	Yes	Organics	-		0.3000	I
Isophorone	78-59-1	No	No	Organics	0.0010	I	0.2000	I
Isopropalin	33820-53-0	No	Yes	Organics	-		0.0150	I
Isopropanol	67-63-0	No	Yes	Organics	-		2.0000	P
Isopropyl Methyl Phosphonic Acid	1832-54-8	No	No	Organics	-		0.1000	I
Isoxaben	82558-50-7	No	No	Organics	-		0.0500	I
JP-4	50815-00-4	No	Yes	Organics	-		-	
JP-5	NA	No	Yes	Organics	-		-	
JP-7	NA	No	Yes	Organics	-		-	
JP-8	NA	No	Yes	Organics	-		-	
Kerosene	8008-20-6	No	Yes	Organics	-		-	
Lactofen	77501-63-4	No	No	Organics	-		0.0080	O
Lactonitrile	78-97-7	No	No	Organics	-		0.0002	X
Lanthanum	7439-91-0	No	No	Inorganics	-		0.0001	P
Lanthanum Acetate Hydrate	100587-90-4	No	No	Organics	-		0.0000	P
Lanthanum Chloride Heptahydrate	10025-84-0	No	No	Inorganics	-		0.0000	P
Lanthanum Chloride, Anhydrous	10099-58-8	No	No	Inorganics	-		0.0000	P
Lanthanum Nitrate Hexahydrate	10277-43-7	No	No	Inorganics	-		0.0000	P
Lead Phosphate	7446-27-7	No	No	Inorganics	0.0085	C	-	
Lead acetate	301-04-2	No	No	Organics	0.2100	C	-	
Lead subacetate	1335-32-6	No	No	Organics	0.0380	C	-	
Lewisite	541-25-3	No	Yes	Organics	-		0.0000	P
Linuron	330-55-2	No	No	Organics	-		0.0077	O
Lithium	7439-93-2	No	No	Inorganics	-		0.0020	P
Lithium Perchlorate	7791-03-9	No	No	Inorganics	-		0.0007	I
Lutetium	7439-94-3	No	No	Inorganics	-		-	
MCPA	94-74-6	No	No	Organics	-		0.0005	I
MCPB	94-81-5	No	No	Organics	-		0.0044	O
MCPP	93-65-2	No	No	Organics	-		0.0010	I
Malathion	121-75-5	No	No	Organics	-		0.0200	I
Maleic Anhydride	108-31-6	No	No	Organics	-		0.1000	I
Maleic Hydrazide	123-33-1	No	No	Organics	-		0.5000	I
Malononitrile	109-77-3	No	No	Organics	-		0.0001	P
Mancozeb	8018-01-7	No	No	Organics	-		0.0300	H
Maneb	12427-38-2	No	No	Organics	-		0.0050	I

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Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		0.0240	G
Mephosfolan	950-10-7	No	No	Organics	-		0.0001	H
Mepiquat Chloride	24307-26-4	No	No	Organics	-		0.0300	I
Mercaptobenzothiazole, 2-	149-30-4	No	No	Organics	0.0110	P	0.0040	P
Mercuric Chloride	7487-94-7	No	No	Inorganics	-		0.0003	I
Mercury (elemental)	7439-97-6	No	Yes	Inorganics	-		-	
Merphos	150-50-5	No	Yes	Organics	-		0.0000	I
Merphos Oxide	78-48-8	No	No	Organics	-		0.0001	O
Metalaxyl	57837-19-1	No	No	Organics	-		0.0600	I
Methacrylonitrile	126-98-7	No	Yes	Organics	-		0.0001	I
Methamidophos	10265-92-6	No	No	Organics	-		0.0001	I
Methanol	67-56-1	No	Yes	Organics	-		2.0000	I
Methidathion	950-37-8	No	No	Organics	-		0.0015	O
Methomyl	16752-77-5	No	No	Organics	-		0.0250	I
Methoxy-5-nitroaniline, 2-	99-59-2	No	No	Organics	0.0490	C	-	
Methoxychlor	72-43-5	No	No	Organics	-		0.0050	I
Methoxyethanol Acetate, 2-	110-49-6	No	Yes	Organics	-		0.0080	P
Methoxyethanol, 2-	109-86-4	No	Yes	Organics	-		0.0050	P
Methyl Acetate	79-20-9	No	Yes	Organics	-		1.0000	X
Methyl Acrylate	96-33-3	No	Yes	Organics	-		-	
Methyl Ethyl Ketone (2-Butanone)	78-93-3	No	Yes	Organics	-		0.6000	I
Methyl Hydrazine	60-34-4	No	Yes	Organics	-		0.0010	P
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	No	Yes	Organics	-		-	
Methyl Isocyanate	624-83-9	No	Yes	Organics	-		-	
Methyl Mercury	22967-92-6	No	No	Inorganics	-		0.0001	I
Methyl Methacrylate	80-62-6	No	Yes	Organics	-		1.4000	I
Methyl Parathion	298-00-0	No	No	Organics	-		0.0003	I
Methyl Phosphonic Acid	993-13-5	No	No	Organics	-		0.0600	X
Methyl Styrene (Mixed Isomers)	25013-15-4	No	Yes	Organics	-		0.0060	H
Methyl methanesulfonate	66-27-3	No	No	Organics	0.0990	C	-	
Methyl tert-Butyl Ether (MTBE)	1634-04-4	No	Yes	Organics	0.0018	C	-	
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	No	No	Organics	-		0.0003	X
Methyl-2-Pentanol, 4-	108-11-2	No	Yes	Organics	-		-	
Methyl-5-Nitroaniline, 2-	99-55-8	No	No	Organics	0.0090	P	0.0200	X
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	No	No	Organics	8.3000	C	-	
Methylaniline Hydrochloride, 2-	636-21-5	No	No	Organics	0.1300	C	-	
Methylarsonic acid	124-58-3	No	No	Organics	-		0.0100	A
Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	No	No	Organics	-		0.0002	X
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	No	No	Organics	0.1000	X	0.0003	X
Methylcholanthrene, 3-	56-49-5	Yes	No	Organics	22.0000	C	-	
Methylcyclopentane	96-37-7	No	Yes	Organics	-		-	
Methylene Chloride	75-09-2	Yes	Yes	Organics	0.0020	I	0.0060	I
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	Yes	No	Organics	0.1000	P	0.0020	P
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	No	No	Organics	0.0460	I	-	
Methylenebisbenzenamine, 4,4'-	101-77-9	No	No	Organics	1.6000	C	-	
Methylenediphenyl Diisocyanate	101-68-8	No	No	Organics	-		-	
Methylnaphthalene, 1-	90-12-0	No	Yes	Organics	0.0290	P	0.0700	A
Methylnaphthalene, 2-	91-57-6	No	Yes	Organics	-		0.0040	I
Methylstyrene, Alpha-	98-83-9	No	Yes	Organics	-		0.0700	H
Metolachlor	51218-45-2	No	No	Organics	-		0.1500	I
Metribuzin	21087-64-9	No	No	Organics	-		0.0250	I
Metsulfuron-methyl	74223-64-6	No	No	Organics	-		0.2500	I
Mineral oils	8012-95-1	No	Yes	Organics	-		3.0000	P
Mirex	2385-85-5	No	Yes	Organics	18.0000	C	0.0002	I
Molinate	2212-67-1	No	No	Organics	-		0.0020	I
Molybdenum	7439-98-7	No	No	Inorganics	-		0.0050	I
Monoaluminum phosphate	13530-50-2	No	No	Inorganics	-		48.6000	P
Monoammonium phosphate	7722-76-1	No	No	Inorganics	-		48.6000	P
Monobutyltin Compounds	NA	No	No	Organics	-		-	
Monocalcium phosphate	7758-23-8	No	No	Inorganics	-		48.6000	P
Monochloramine	10599-90-3	No	No	Inorganics	-		0.1000	I

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Monomagnesium phosphate	7757-86-0	No	No	Inorganics	-		48.6000	P
Monomethylaniline	100-61-8	No	No	Organics	-		0.0020	P
Monopotassium phosphate	7778-77-0	No	No	Inorganics	-		48.6000	P
Monosodium phosphate	7558-80-7	No	No	Inorganics	-		48.6000	P
Myclobutanil	88671-89-0	No	No	Organics	-		0.0250	I
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	No	No	Organics	-		0.0003	X
Naled	300-76-5	No	Yes	Organics	-		0.0020	I
Naphtha, High Flash Aromatic (HFAN)	64742-95-6	No	Yes	Organics	-		0.0300	X
Naphthalene	91-20-3	No	Yes	Organics	0.1200	C	0.0200	I
Naphthylamine, 2-	91-59-8	No	No	Organics	1.8000	C	-	
Napropamide	15299-99-7	No	No	Organics	-		0.1200	O
Neodymium Chloride (Stable, Nonradioactive)	10024-93-8	No	No	Inorganics	-		-	
Nickel Acetate	373-02-4	No	No	Organics	0.9100	C	0.0110	C
Nickel Carbonate	3333-67-3	No	No	Organics	0.9100	C	0.0110	C
Nickel Carbonyl	13463-39-3	No	Yes	Organics	0.9100	C	0.0110	C
Nickel Hydroxide	12054-48-7	No	No	Inorganics	0.9100	C	0.0110	C
Nickel Oxide	1313-99-1	No	No	Inorganics	0.9100	C	0.0110	C
Nickel Refinery Dust	NA	No	No	Inorganics	0.9100	C	0.0110	C
Nickel Soluble Salts	7440-02-0	No	No	Inorganics	-		0.0200	I
Nickel Subsulfide	12035-72-2	No	No	Inorganics	1.7000	C	0.0110	C
Nickelocene	1271-28-9	No	No	Organics	0.9100	C	0.0110	C
Nitrate (measured as nitrogen)	14797-55-8	No	No	Inorganics	-		1.6000	I
Nitrite (measured as nitrogen)	14797-65-0	No	No	Inorganics	-		0.1000	I
Nitroaniline, 2-	88-74-4	No	No	Organics	-		0.0100	X
Nitroaniline, 3-	99-09-2	No	No	Organics	-		-	
Nitroaniline, 4-	100-01-6	No	No	Organics	0.0200	P	0.0040	P
Nitrobenzene	98-95-3	No	Yes	Organics	-		0.0020	I
Nitrocellulose	9004-70-0	No	No	Organics	-		3000.0000	P
Nitrofurantoin	67-20-9	No	No	Organics	-		0.0700	H
Nitrofurazone	59-87-0	No	No	Organics	1.3000	C	-	
Nitroglycerin	55-63-0	No	No	Organics	0.0170	P	0.0001	P
Nitroguanidine	556-88-7	No	No	Organics	-		0.1000	I
Nitromethane	75-52-5	No	Yes	Organics	-		-	
Nitrophenol, 2-	88-75-5	No	Yes	Organics	-		-	
Nitropropane, 2-	79-46-9	No	Yes	Organics	-		-	
Nitropyrene, 4-	57835-92-4	No	No	Organics	1.2000	C	-	
Nitroso-N-ethylurea, N-	759-73-9	Yes	No	Organics	27.0000	C	-	
Nitroso-N-methylurea, N-	684-93-5	Yes	No	Organics	120.0000	C	-	
Nitroso-di-N-butylamine, N-	924-16-3	No	Yes	Organics	5.4000	I	-	
Nitroso-di-N-propylamine, N-	621-64-7	No	No	Organics	7.0000	I	-	
Nitrosodiethanolamine, N-	1116-54-7	No	No	Organics	2.8000	I	-	
Nitrosodiethylamine, N-	55-18-5	Yes	No	Organics	150.0000	I	-	
Nitrosodimethylamine, N-	62-75-9	Yes	Yes	Organics	51.0000	I	0.0000	P
Nitrosodiphenylamine, N-	86-30-6	No	No	Organics	0.0049	I	-	
Nitrosomethylethylamine, N-	10595-95-6	No	Yes	Organics	22.0000	I	-	
Nitrosomorpholine [N-]	59-89-2	No	No	Organics	6.7000	C	-	
Nitrosopiperidine [N-]	100-75-4	No	No	Organics	9.4000	C	-	
Nitrosopyrrolidine, N-	930-55-2	No	No	Organics	2.1000	I	-	
Nitrotoluene, m-	99-08-1	No	No	Organics	-		0.0001	X
Nitrotoluene, o-	88-72-2	No	Yes	Organics	0.2200	P	0.0009	P
Nitrotoluene, p-	99-99-0	No	No	Organics	0.0160	P	0.0040	P
Nonane, n-	111-84-2	No	Yes	Organics	-		0.0003	X
Norflurazon	27314-13-2	No	No	Organics	-		0.0150	O
OCDD	3268-87-9	No	No	Organics	39.0000	W	0.0000	W
OCDF	39001-02-0	No	No	Organics	39.0000	W	0.0000	W
Octabromodiphenyl Ether	32536-52-0	No	No	Organics	-		0.0030	I
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	No	No	Organics	-		0.0500	I
Octamethylpyrophosphoramide	152-16-9	No	No	Organics	-		0.0020	H
Octyl Phthalate, di-N-	117-84-0	No	No	Organics	-		0.0100	P

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Oryzalin	19044-88-3	No	No	Organics	0.0078	O	0.1400	O
Oxadiazon	19666-30-9	No	No	Organics	-		0.0050	I
Oxamyl	23135-22-0	No	No	Organics	-		0.0250	I
Oxyfluorfen	42874-03-3	No	No	Organics	0.0732	O	0.0300	O
Paclobutrazol	76738-62-0	No	No	Organics	-		0.0130	I
Paraquat Dichloride	1910-42-5	No	No	Organics	-		0.0045	I
Parathion	56-38-2	No	No	Organics	-		0.0060	H
PeCDF, 1,2,3,7,8-	57117-41-6	No	No	Organics	3900.0000	W	0.0000	W
PeCDF, 2,3,4,7,8-	57117-31-4	No	No	Organics	39000.0000	W	0.0000	W
Pebulate	1114-71-2	No	Yes	Organics	-		0.0500	H
Pendimethalin	40487-42-1	No	No	Organics	-		0.3000	O
Pentabromodiphenyl Ether	32534-81-9	No	Yes	Organics	-		0.0020	I
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	No	No	Organics	-		0.0001	I
Pentachlorobenzene	608-93-5	No	Yes	Organics	-		0.0008	I
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	No	Yes	Organics	3.9000	W	0.0000	W
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	No	Yes	Organics	3.9000	W	0.0000	W
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	No	Yes	Organics	3.9000	W	0.0000	W
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	No	Yes	Organics	3.9000	W	0.0000	W
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	No	Yes	Organics	13000.0000	W	0.0000	W
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	No	No	Organics	130000.0000	W	0.0000	W
Pentachloroethane	76-01-7	No	Yes	Organics	0.0900	P	-	
Pentachloronitrobenzene	82-68-8	No	Yes	Organics	0.2600	H	0.0030	I
Pentachlorophenol	87-86-5	No	No	Organics	0.4000	I	0.0050	I
Pentaerythritol tetranitrate (PETN)	78-11-5	No	No	Organics	0.0040	X	0.0020	P
Pentane, n-	109-66-0	No	Yes	Organics	-		-	
Perchlorate and Perchlorate Salts	14797-73-0	No	No	Inorganics	-		0.0007	I
Perfluorobutane sulfonic acid (PFBS)	375-73-5	No	No	Organics	-		0.0200	P
Perfluorobutanesulfonate	45187-15-3	No	No	Organics	-		0.0200	P
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	Organics	-		0.0000	D
Perfluorooctanesulfonate	45298-90-6	No	No	Organics	-		0.0000	D
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	Organics	0.0700	D	0.0000	D
Permethrin	52645-53-1	No	No	Organics	-		0.0500	I
Phenacetin	62-44-2	No	No	Organics	0.0022	C	-	
Phenmedipham	13684-63-4	No	No	Organics	-		0.2400	O
Phenol	108-95-2	No	No	Organics	-		0.3000	I
Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	No	No	Organics	-		0.0040	I
Phenothiazine	92-84-2	No	No	Organics	-		0.0005	X
Phenyl Isothiocyanate	103-72-0	No	Yes	Organics	-		0.0002	X
Phenylenediamine, m-	108-45-2	No	No	Organics	-		0.0060	I
Phenylenediamine, o-	95-54-5	No	No	Organics	0.1200	P	0.0040	P
Phenylenediamine, p-	106-50-3	No	No	Organics	-		0.0010	X
Phenylmercuric Acetate	62-38-4	No	No	Organics	-		0.0001	I
Phenylphenol, 2-	90-43-7	No	No	Organics	0.0019	H	-	
Phorate	298-02-2	No	No	Organics	-		0.0002	H
Phosgene	75-44-5	No	Yes	Organics	-		-	
Phosmet	732-11-6	No	No	Organics	-		0.0200	I
Phosphine	7803-51-2	No	Yes	Inorganics	-		0.0003	I
Phosphoric Acid	7664-38-2	No	No	Inorganics	-		48.6000	P
Phosphorus, White	7723-14-0	No	Yes	Inorganics	-		0.0000	I
Phthalic Acid, P-	100-21-0	No	No	Organics	-		1.0000	H
Phthalic Anhydride	85-44-9	No	No	Organics	-		2.0000	I
Picloram	1918-02-1	No	No	Organics	-		0.0700	I
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	No	No	Organics	-		0.0001	X
Picric Acid (2,4,6-Trinitrophenol)	88-89-1	No	No	Organics	-		0.0009	X
Pirimiphos, Methyl	29232-93-7	No	No	Organics	-		0.0001	O
Polybrominated Biphenyls	36355-01-8	No	No	Organics	30.0000	C	0.0000	H
Polychlorinated Biphenyls (low risk)	1336-36-3	No	Yes	Organics	0.4000	I	-	
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	No	No	Organics	-		-	
Polyphosphoric acid	8017-16-1	No	No	Inorganics	-		48.6000	P
Potassium Cyanide	151-50-8	No	No	Inorganics	-		0.0020	I
Potassium Perchlorate	7778-74-7	No	No	Inorganics	-		0.0007	I

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Potassium Perfluorobutane Sulfonate	29420-49-3	No	No	Organics	-		0.0200	P
Potassium Perfluorooctane Sulfonate	2795-39-3	No	No	Organics	-		0.0000	D
Potassium Silver Cyanide	506-61-6	No	No	Inorganics	-		0.0050	I
Potassium tripolyphosphate	13845-36-8	No	No	Inorganics	-		48.6000	P
Praseodymium Chloride (Stable, Nonradioactive)	10361-79-2	No	No	Inorganics	-		-	
Prochloraz	67747-09-5	No	No	Organics	0.1500	I	0.0090	I
Profluralin	26399-36-0	No	Yes	Organics	-		0.0060	H
Prometon	1610-18-0	No	No	Organics	-		0.0150	I
Prometryn	7287-19-6	No	No	Organics	-		0.0400	O
Pronamide	23950-58-5	No	No	Organics	-		0.0750	I
Propachlor	1918-16-7	No	No	Organics	-		0.0130	I
Propanil	709-98-8	No	No	Organics	-		0.0050	I
Propargite	2312-35-8	No	No	Organics	0.1920	O	0.0400	O
Propargyl Alcohol	107-19-7	No	Yes	Organics	-		0.0020	I
Propazine	139-40-2	No	No	Organics	-		0.0200	I
Propham	122-42-9	No	No	Organics	-		0.0200	I
Propiconazole	60207-90-1	No	No	Organics	-		0.1000	O
Propionaldehyde	123-38-6	No	Yes	Organics	-		-	
Propyl benzene	103-65-1	No	Yes	Organics	-		0.1000	X
Propylene	115-07-1	No	Yes	Organics	-		-	
Propylene Glycol	57-55-6	No	No	Organics	-		20.0000	P
Propylene Glycol Dinitrate	6423-43-4	No	No	Organics	-		-	
Propylene Glycol Monomethyl Ether	107-98-2	No	Yes	Organics	-		0.7000	H
Propylene Oxide	75-56-9	No	Yes	Organics	0.2400	I	-	
Pyrene	129-00-0	No	Yes	Organics	-		0.0300	I
Pyridine	110-86-1	No	Yes	Organics	-		0.0010	I
Quinalphos	13593-03-8	No	No	Organics	-		0.0005	I
Quinoline	91-22-5	No	No	Organics	3.0000	I	-	
Quizalofop-ethyl	76578-14-8	No	No	Organics	-		0.0090	I
Resmethrin	10453-86-8	No	No	Organics	-		0.0300	I
Ronnel	299-84-3	No	Yes	Organics	-		0.0500	H
Rotenone	83-79-4	No	No	Organics	-		0.0040	I
Rubidium	7440-17-7	No	No	Inorganics	-		-	
Rubidium Chloride	7791-11-9	No	No	Inorganics	-		-	
Rubidium Hydroxide	1310-82-3	No	No	Inorganics	-		-	
Rubidium Iodide	7790-29-6	No	No	Inorganics	-		-	
Safrole	94-59-7	Yes	No	Organics	0.2200	C	-	
Samarium Chloride (Stable, Nonradioactive)	10361-82-7	No	No	Inorganics	-		-	
Samarium Nitrate (Stable, Nonradioactive)	10361-83-8	No	No	Inorganics	-		-	
Selenious Acid	7783-00-8	No	No	Inorganics	-		0.0050	I
Selenium	7782-49-2	No	No	Inorganics	-		0.0050	I
Selenium Sulfide	7446-34-6	No	No	Inorganics	-		0.0050	C
Sethoxydim	74051-80-2	No	No	Organics	-		0.1400	O
Silica (crystalline, respirable)	7631-86-9	No	No	Inorganics	-		-	
Silver	7440-22-4	No	No	Inorganics	-		0.0050	I
Silver Cyanide	506-64-9	No	No	Inorganics	-		0.1000	I
Simazine	122-34-9	No	No	Organics	0.1200	H	0.0050	I
Sodium Acifluorfen	62476-59-9	No	No	Organics	-		0.0130	I
Sodium Azide	26628-22-8	No	No	Inorganics	-		0.0040	I
Sodium Cyanide	143-33-9	No	No	Inorganics	-		0.0010	I
Sodium Diethyldithiocarbamate	148-18-5	No	No	Organics	0.2700	H	0.0300	I
Sodium Fluoride	7681-49-4	No	No	Inorganics	-		0.0500	A
Sodium Fluoroacetate	62-74-8	No	No	Organics	-		0.0000	I
Sodium Metavanadate	13718-26-8	No	No	Inorganics	-		0.0010	H
Sodium Perchlorate	7601-89-0	No	No	Inorganics	-		0.0007	I
Sodium Tungstate	13472-45-2	No	No	Inorganics	-		0.0008	P
Sodium Tungstate Dihydrate	10213-10-2	No	No	Inorganics	-		0.0008	P
Sodium acid pyrophosphate	7758-16-9	No	No	Inorganics	-		48.6000	P
Sodium aluminum phosphate (acidic)	7785-88-8	No	No	Inorganics	-		48.6000	P
Sodium aluminum phosphate (anhydrous)	10279-59-1	No	No	Inorganics	-		48.6000	P
Sodium aluminum phosphate (tetrahydrate)	10305-76-7	No	No	Inorganics	-		48.6000	P

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Sodium hexametaphosphate	10124-56-8	No	No	Inorganics	-		48.6000	P
Sodium polyphosphate	68915-31-1	No	No	Inorganics	-		48.6000	P
Sodium trimetaphosphate	7785-84-4	No	No	Inorganics	-		48.6000	P
Sodium tripolyphosphate	7758-29-4	No	No	Inorganics	-		48.6000	P
Stirofos (Tetrachlorovinphos)	961-11-5	No	No	Organics	0.0240	H	0.0300	I
Strontium, Stable	7440-24-6	No	No	Inorganics	-		0.6000	I
Strychnine	57-24-9	No	No	Organics	-		0.0003	I
Styrene	100-42-5	No	Yes	Organics	-		0.2000	I
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	No	No	Organics	-		0.0030	P
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	No	No	Organics	-		0.0030	P
Sulfolane	126-33-0	No	No	Organics	-		0.0010	P
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	No	No	Organics	-		0.0008	P
Sulfur Mustard	505-60-2	No	Yes	Organics	-		-	
Sulfur Trioxide	7446-11-9	No	Yes	Inorganics	-		-	
Sulfuric Acid	7664-93-9	No	No	Inorganics	-		-	
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	No	No	Organics	0.0250	I	0.0500	H
TCDD, 2,3,7,8-	1746-01-6	No	Yes	Organics	130000.0000	C	0.0000	I
TCDF, 2,3,7,8-	51207-31-9	No	Yes	Organics	13000.0000	W	0.0000	W
TCMTB	21564-17-0	No	No	Organics	-		0.0300	H
Tebuthiuron	34014-18-1	No	No	Organics	-		0.0700	I
Temephos	3383-96-8	No	No	Organics	-		0.0200	H
Terbacil	5902-51-2	No	No	Organics	-		0.0130	I
Terbufos	13071-79-9	No	Yes	Organics	-		0.0000	H
Terbutryn	886-50-0	No	No	Organics	-		0.0010	I
Tert-Butyl Acetate	540-88-5	No	Yes	Organics	0.0050	C	-	
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	No	No	Organics	-		0.0001	I
Tetrachlorobenzene, 1,2,4,5-	95-94-3	No	Yes	Organics	-		0.0003	I
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	No	No	Organics	13.0000	W	0.0000	W
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	No	Yes	Organics	39.0000	W	0.0000	W
Tetrachloroethane, 1,1,1,2-	630-20-6	No	Yes	Organics	0.0260	I	0.0300	I
Tetrachloroethane, 1,1,2,2-	79-34-5	No	Yes	Organics	0.2000	I	0.0200	I
Tetrachloroethylene	127-18-4	No	Yes	Organics	0.0021	I	0.0060	I
Tetrachlorophenol, 2,3,4,6-	58-90-2	No	No	Organics	-		0.0300	I
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	No	Yes	Organics	16.0000	X	0.0001	X
Tetraethyl Dithiopyrophosphate	3689-24-5	No	No	Organics	-		0.0005	I
Tetraethyl Lead	78-00-2	No	Yes	Organics	-		0.0000	I
Tetrafluoroethane, 1,1,1,2-	811-97-2	No	Yes	Organics	-		-	
Tetrahydrofuran	109-99-9	No	Yes	Organics	-		0.9000	I
Tetramethylcyclohexane	30501-43-0	No	Yes	Organics	-		-	
Tetrapotassium phosphate	7320-34-5	No	No	Inorganics	-		48.6000	P
Tetrasodium pyrophosphate	7722-88-5	No	No	Inorganics	-		48.6000	P
Tetryl (Trinitrophenylmethylnitramine)	479-45-8	No	No	Organics	-		0.0020	P
Thallic Oxide	1314-32-5	No	No	Inorganics	-		0.0000	G
Thallium (I) Nitrate	10102-45-1	No	No	Inorganics	-		0.0000	X
Thallium (Soluble Salts)	7440-28-0	No	No	Inorganics	-		0.0000	X
Thallium Acetate	563-68-8	No	Yes	Organics	-		0.0000	X
Thallium Carbonate	6533-73-9	No	Yes	Inorganics	-		0.0000	X
Thallium Chloride	7791-12-0	No	No	Inorganics	-		0.0000	X
Thallium Selenite	12039-52-0	No	No	Inorganics	-		0.0000	G
Thallium Sulfate	7446-18-6	No	No	Inorganics	-		0.0000	X
Thifensulfuron-methyl	79277-27-3	No	No	Organics	-		0.0430	O
Thiobencarb	28249-77-6	No	No	Organics	-		0.0100	I
Thiocyanates	NA	No	No	Inorganics	-		0.0002	P
Thiocyanic Acid	463-56-9	No	Yes	Inorganics	-		0.0002	X
Thiodiglycol	111-48-8	No	No	Organics	-		0.0700	X
Thiofanox	39196-18-4	No	No	Organics	-		0.0003	H
Thiophanate, Methyl	23564-05-8	No	No	Organics	0.0116	O	0.0270	O
Thiram	137-26-8	No	No	Organics	-		0.0150	O

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Tin	7440-31-5	No	No	Inorganics	-		0.6000	H
Titanium Tetrachloride	7550-45-0	No	Yes	Inorganics	-		-	
Toluene	108-88-3	No	Yes	Organics	-		0.0800	I
Toluene-2,4-diisocyanate	584-84-9	No	Yes	Organics	0.0390	C	-	
Toluene-2,5-diamine	95-70-5	No	No	Organics	0.1800	X	0.0002	X
Toluene-2,6-diisocyanate	91-08-7	No	Yes	Organics	0.0390	C	-	
Toluic Acid, p-	99-94-5	No	No	Organics	-		0.0050	P
Toluidine, o- (Methylaniline, 2-)	95-53-4	No	No	Organics	0.0160	P	-	
Toluidine, p-	106-49-0	No	No	Organics	0.0300	P	0.0040	X
Total Petroleum Hydrocarbons (Aliphatic High)	NA	No	Yes	Organics	-		3.0000	P
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	No	Yes	Organics	-		-	
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	No	Yes	Organics	-		0.0100	X
Total Petroleum Hydrocarbons (Aromatic High)	NA	No	No	Organics	-		0.0400	P
Total Petroleum Hydrocarbons (Aromatic Low)	NA	No	Yes	Organics	-		0.0040	P
Total Petroleum Hydrocarbons (Aromatic Medium)	NA	No	Yes	Organics	-		0.0040	P
Toxaphene	8001-35-2	No	No	Organics	1.1000	I	0.0001	P
Toxaphene, Weathered	NA	No	No	Organics	-		0.0000	X
Tralomethrin	66841-25-6	No	No	Organics	-		0.0075	I
Tri-n-butyltin	688-73-3	No	Yes	Organics	-		0.0003	A
Triacetin	102-76-1	No	No	Organics	-		80.0000	X
Triadimefon	43121-43-3	No	No	Organics	-		0.0340	O
Triallate	2303-17-5	No	Yes	Organics	0.0717	O	0.0250	O
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	No	No	Inorganics	-		48.6000	P
Triasulfuron	82097-50-5	No	No	Organics	-		0.0100	I
Tribenuron-methyl	101200-48-0	No	No	Organics	-		0.0080	I
Tribromobenzene, 1,2,4-	615-54-3	No	Yes	Organics	-		0.0050	I
Tribromophenol, 2,4,6-	118-79-6	No	No	Organics	-		0.0090	X
Tributyl Phosphate	126-73-8	No	No	Organics	0.0090	P	0.0100	P
Tributyltin Compounds	NA	No	No	Organics	-		0.0003	P
Tributyltin Oxide	56-35-9	No	No	Organics	-		0.0003	I
Tricalcium phosphate	7758-87-4	No	No	Inorganics	-		48.6000	P
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	No	Yes	Organics	-		30.0000	I
Trichloro-2'-hydroxydiphenylether	3380-34-5	No	No	Organics	-		-	
Trichloroacetic Acid	76-03-9	No	No	Organics	0.0700	I	0.0200	I
Trichloroaniline HCl, 2,4,6-	33663-50-2	No	No	Organics	0.0290	H	-	
Trichloroaniline, 2,4,6-	634-93-5	No	No	Organics	0.0070	X	0.0000	X
Trichlorobenzene, 1,2,3-	87-61-6	No	Yes	Organics	-		0.0008	X
Trichlorobenzene, 1,2,4-	120-82-1	No	Yes	Organics	0.0290	P	0.0100	I
Trichloroethane, 1,1,1-	71-55-6	No	Yes	Organics	-		2.0000	I
Trichloroethane, 1,1,2-	79-00-5	No	Yes	Organics	0.0570	I	0.0040	I
Trichloroethylene	79-01-6	Yes	Yes	Organics	0.0460	I	0.0005	I
Trichlorofluoromethane	75-69-4	No	Yes	Organics	-		0.3000	I
Trichlorophenol, 2,4,5-	95-95-4	No	No	Organics	-		0.1000	I
Trichlorophenol, 2,4,6-	88-06-2	No	No	Organics	0.0110	I	0.0010	P
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	No	No	Organics	-		0.0100	I
Trichlorophenoxypropionic acid, -2,4,5	93-72-1	No	No	Organics	-		0.0080	I
Trichloropropane, 1,1,2-	598-77-6	No	Yes	Organics	-		0.0050	I
Trichloropropane, 1,2,3-	96-18-4	Yes	Yes	Organics	30.0000	I	0.0040	I
Trichloropropene, 1,2,3-	96-19-5	No	Yes	Organics	-		0.0030	X
Tricresyl Phosphate (TCP)	1330-78-5	No	No	Organics	-		0.0200	A
Tridiphane	58138-08-2	No	No	Organics	-		0.0030	I
Triethylamine	121-44-8	No	Yes	Organics	-		-	
Triethylene Glycol	112-27-6	No	No	Organics	-		2.0000	P
Trifluoroethane, 1,1,1-	420-46-2	No	Yes	Organics	-		-	
Trifluralin	1582-09-8	No	Yes	Organics	0.0077	I	0.0075	I
Trimagnesium phosphate	7757-87-1	No	No	Inorganics	-		48.6000	P
Trimethyl Phosphate	512-56-1	No	No	Organics	0.0200	P	0.0100	P
Trimethylbenzene, 1,2,3-	526-73-8	No	Yes	Organics	-		0.0100	I
Trimethylbenzene, 1,2,4-	95-63-6	No	Yes	Organics	-		0.0100	I

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref
Trimethylbenzene, 1,3,5-	108-67-8	No	Yes	Organics	-		0.0100	I
Trimethylpentene, 2,4,4-	25167-70-8	No	Yes	Organics	-		0.0100	X
Trinitrobenzene, 1,3,5-	99-35-4	No	No	Organics	-		0.0300	I
Trinitrotoluene, 2,4,6-	118-96-7	No	No	Organics	0.0300	I	0.0005	I
Triphenylphosphine Oxide	791-28-6	No	No	Organics	-		0.0200	P
Tripotassium phosphate	7778-53-2	No	No	Inorganics	-		48.6000	P
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	No	No	Organics	-		0.0200	A
Tris(1-chloro-2-propyl)phosphate	13674-84-5	No	No	Organics	-		0.0100	X
Tris(2,3-dibromopropyl)phosphate	126-72-7	No	Yes	Organics	2.3000	C	-	
Tris(2-chloroethyl)phosphate	115-96-8	No	No	Organics	0.0200	P	0.0070	P
Tris(2-ethylhexyl)phosphate	78-42-2	No	No	Organics	0.0032	P	0.1000	P
Trisbutoxyethyl Phosphate	78-51-3	No	No	Organics	-		-	
Trisodium phosphate	7601-54-9	No	No	Inorganics	-		48.6000	P
Tungsten	7440-33-7	No	No	Inorganics	-		0.0008	P
Uranium	NA	No	No	Inorganics	-		0.0002	A
Urethane	51-79-6	Yes	No	Organics	1.0000	C	-	
Vanadium Pentoxide	1314-62-1	No	No	Inorganics	-		0.0090	I
Vanadium and Compounds	7440-62-2	No	No	Inorganics	-		0.0050	G
Vernolate	1929-77-7	No	Yes	Organics	-		0.0010	I
Vinclozolin	50471-44-8	No	No	Organics	-		0.0012	O
Vinyl Acetate	108-05-4	No	Yes	Organics	-		1.0000	H
Vinyl Bromide	593-60-2	No	Yes	Organics	-		-	
Vinyl Chloride	75-01-4	Yes	Yes	Organics	0.7200	I	0.0030	I
Warfarin	81-81-2	No	No	Organics	-		0.0003	I
Xylene, m-	108-38-3	No	Yes	Organics	-		0.2000	G
Xylene, o-	95-47-6	No	Yes	Organics	-		0.2000	G
Xylene, p-	106-42-3	No	Yes	Organics	-		0.2000	G
Xylenes	1330-20-7	No	Yes	Organics	-		0.2000	I
Zinc Cyanide	557-21-1	No	No	Inorganics	-		0.0500	I
Zinc Phosphide	1314-84-7	No	No	Inorganics	-		0.0003	I
Zinc and Compounds	7440-66-6	No	No	Inorganics	-		0.3000	I
Zineb	12122-67-7	No	No	Organics	-		0.0500	I
Zirconium	7440-67-7	No	No	Inorganics	-		0.0001	X

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Site-specific

Recreator Regional Screening Level

Key: I = IRIS; P = PPRTV; O = OPP; A = ATS/ = TEF applied; E = RPF applied; G = see user's guide; U = user prov Csat exceeded.

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Acenaphthene	-		1.0000	0.0860	154.2100	1.0000	Yes	-
Acephate	-		1.0000	0.0000	183.1700	1.0000	Yes	-
Acetaldehyde	0.0090	I	1.0000	0.0005	44.0540	1.0000	Yes	-
Acetochlor	-		1.0000	0.0050	269.7700	0.9000	Yes	-
Acetone	30.9000	A	1.0000	0.0005	58.0810	1.0000	Yes	-
Acetone Cyanohydrin	0.0020	X	1.0000	0.0005	85.1060	1.0000	Yes	-
Acetonitrile	0.0600	I	1.0000	0.0005	41.0530	1.0000	Yes	-
Acetophenone	-		1.0000	0.0037	120.1500	1.0000	Yes	-
Acetylaminofluorene, 2-	-		1.0000	0.0104	223.2800	1.0000	Yes	0.0000
Acrolein	0.0000	I	1.0000	0.0007	56.0650	1.0000	Yes	-
Acrylamide	0.0060	I	1.0000	0.0002	71.0790	1.0000	Yes	0.0001
Acrylic Acid	0.0010	I	1.0000	0.0011	72.0640	1.0000	Yes	-
Acrylonitrile	0.0020	I	1.0000	0.0012	53.0640	1.0000	Yes	0.0003
Adiponitrile	0.0060	P	1.0000	0.0002	108.1400	1.0000	Yes	-
Alachlor	-		1.0000	0.0105	269.7700	0.9000	Yes	0.0028
Aldicarb	-		1.0000	0.0008	190.2700	1.0000	Yes	-
Aldicarb Sulfone	-		1.0000	0.0000	222.2600	1.0000	Yes	-
Aldrin	-		1.0000	0.2930	364.9200	1.0000	No	-
Allyl Alcohol	0.0001	X	1.0000	0.0010	58.0810	1.0000	Yes	-
Allyl Chloride	0.0010	I	1.0000	0.0112	76.5260	1.0000	Yes	0.0074
Aluminum	0.0050	P	1.0000	0.0010	26.9820	1.0000	Yes	-
Aluminum Phosphide	-		1.0000	0.0010	57.9550	1.0000	Yes	-
Aluminum metaphosphate	-		1.0000	0.0010	263.9000	1.0000	Yes	-
Ametryn	-		1.0000	0.0079	227.3300	1.0000	Yes	-
Aminobiphenyl, 4-	-		1.0000	0.0140	169.2300	1.0000	Yes	0.0000
Aminophenol, m-	-		1.0000	0.0005	109.1300	1.0000	Yes	-
Aminophenol, o-	-		1.0000	0.0010	109.1300	1.0000	Yes	-
Aminophenol, p-	-		1.0000	0.0004	109.1300	1.0000	Yes	-
Amitraz	-		1.0000	0.1600	293.4200	0.9000	Yes	-
Ammonium Perchlorate	-		1.0000	0.0010	117.4900	1.0000	Yes	-
Ammonium Sulfamate	-		1.0000	0.0010	114.1240	1.0000	Yes	-
Ammonium polyphosphate	-		1.0000	0.0010	-	0.0000	Yes	-
Amyl Alcohol, tert-	0.0030	X	1.0000	0.0020	88.1510	1.0000	Yes	-
Aniline	0.0010	I	1.0000	0.0019	93.1290	1.0000	Yes	0.0273
Anthracene	-		1.0000	0.1420	178.2400	1.0000	Yes	-
Anthraquinone, 9,10-	-		1.0000	0.0190	208.2200	0.9000	Yes	0.0039
Antimony (metallic)	0.0003	A	0.1500	0.0010	121.7600	1.0000	Yes	-
Antimony Pentoxide	-		0.1500	0.0010	323.5170	1.0000	Yes	-
Antimony Potassium Tartrate	-		1.0000	0.0000	613.8200	1.0000	No	-
Antimony Tetroxide	-		0.1500	0.0010	307.5200	1.0000	Yes	-
Antimony Trichloride	-		1.0000	0.0010	228.1100	1.0000	Yes	-
Antimony Trioxide	0.0002	I	0.1500	0.0010	291.5200	1.0000	Yes	-
Aroclor 1016	-		1.0000	0.3050	257.5500	0.9000	No	-
Aroclor 1221	-		1.0000	0.1680	188.6600	1.0000	Yes	0.0001
Aroclor 1232	-		1.0000	0.1680	188.6600	1.0000	Yes	0.0001
Aroclor 1242	-		1.0000	0.5450	291.9900	0.7000	No	-
Aroclor 1248	-		1.0000	0.4750	291.9900	0.7000	No	-
Aroclor 1254	-		1.0000	0.7510	326.4400	0.5000	No	-
Aroclor 1260	-		1.0000	0.9860	395.3300	0.0000	No	-
Aroclor 5460	-		1.0000	0.5840	540.3000	0.0000	No	-
Arsenic, Inorganic	0.0000	C	1.0000	0.0010	74.9220	1.0000	Yes	0.0001
Arsine	0.0001	I	1.0000	0.0010	77.9460	1.0000	Yes	-
Asulam	-		1.0000	0.0001	230.2400	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Atrazine	-		1.0000	0.0052	215.6900	1.0000	Yes	0.0007
Auramine	-		1.0000	0.0048	267.3800	0.9000	Yes	0.0002
Avermectin B1	-		1.0000	0.0000	875.1200	1.0000	No	-
Azinphos-methyl	0.0100	A	1.0000	0.0018	317.3300	1.0000	Yes	-
Azobenzene	-		1.0000	0.0514	182.2300	1.0000	Yes	0.0014
Azodicarbonamide	0.0000	P	1.0000	0.0000	116.0800	1.0000	Yes	-
Barium	0.0005	H	0.0700	0.0010	137.3300	1.0000	Yes	-
Benfluralin	-		1.0000	0.0675	335.2900	0.8000	Yes	-
Benomyl	-		1.0000	0.0009	290.3200	1.0000	Yes	-
Bensulfuron-methyl	-		1.0000	0.0002	410.4100	1.0000	Yes	-
Bentazon	-		1.0000	0.0025	240.2800	1.0000	Yes	-
Benz[a]anthracene	-		1.0000	0.5520	228.3000	1.0000	No	-
Benzaldehyde	-		1.0000	0.0038	106.1300	1.0000	Yes	0.0389
Benzene	0.0300	I	1.0000	0.0149	78.1150	1.0000	Yes	0.0028
Benzenediamine-2-methyl sulfate, 1,4-	-		1.0000	0.0000	220.2400	1.0000	No	-
Benzenethiol	-		1.0000	0.0178	110.1800	1.0000	Yes	-
Benzidine	-		1.0000	0.0011	184.2400	1.0000	Yes	0.0000
Benzo(j)fluoranthene	-		1.0000	0.6900	252.3200	0.9000	No	-
Benzo[a]pyrene	0.0000	I	1.0000	0.7130	252.3200	1.0000	No	-
Benzo[b]fluoranthene	-		1.0000	0.4170	252.3200	1.0000	No	-
Benzo[k]fluoranthene	-		1.0000	0.6910	252.3200	0.9000	No	-
Benzoic Acid	-		1.0000	0.0057	122.1200	1.0000	Yes	-
Benzotrichloride	-		1.0000	0.0487	195.4800	1.0000	Yes	0.0000
Benzyl Alcohol	-		1.0000	0.0021	108.1400	1.0000	Yes	-
Benzyl Chloride	0.0010	P	1.0000	0.0103	126.5900	1.0000	Yes	0.0009
Beryllium and compounds	0.0000	I	0.0070	0.0010	9.0100	1.0000	Yes	-
Bifenox	-		1.0000	0.0179	342.1400	0.9000	Yes	-
Biphenthrin	-		1.0000	1.7400	422.8800	0.0000	Yes	-
Biphenyl, 1,1'-	0.0004	X	1.0000	0.0943	154.2100	1.0000	Yes	0.0195
Bis(2-chloro-1-methylethyl) ether	-		1.0000	0.0076	171.0700	1.0000	Yes	-
Bis(2-chloroethoxy)methane	-		1.0000	0.0012	173.0400	1.0000	Yes	-
Bis(2-chloroethyl)ether	-		1.0000	0.0018	143.0100	1.0000	Yes	0.0001
Bis(2-ethylhexyl)phthalate	-		1.0000	1.1300	390.5700	0.8000	No	-
Bis(chloromethyl)ether	-		1.0000	0.0009	114.9600	1.0000	Yes	0.0000
Bisphenol A	-		1.0000	0.0132	228.2900	1.0000	Yes	-
Boron And Borates Only	0.0200	H	1.0000	0.0010	13.8400	1.0000	Yes	-
Boron Trichloride	0.0200	P	1.0000	0.0010	117.1700	1.0000	Yes	-
Boron Trifluoride	0.0130	C	1.0000	0.0010	67.8060	1.0000	Yes	-
Bromate	-		1.0000	0.0010	79.9000	1.0000	Yes	0.0002
Bromo-2-chloroethane, 1-	-		1.0000	0.0046	143.4100	1.0000	Yes	0.0001
Bromo-3-fluorobenzene, 1-	-		1.0000	0.0142	175.0000	1.0000	Yes	-
Bromo-4-fluorobenzene, 1-	-		1.0000	0.0182	175.0000	1.0000	Yes	-
Bromobenzene	0.0600	I	1.0000	0.0200	157.0100	1.0000	Yes	-
Bromochloromethane	0.0400	X	1.0000	0.0026	129.3800	1.0000	Yes	-
Bromodichloromethane	-		1.0000	0.0040	163.8300	1.0000	Yes	0.0025
Bromoform	-		1.0000	0.0024	252.7300	1.0000	Yes	0.0197
Bromomethane	0.0050	I	1.0000	0.0028	94.9390	1.0000	Yes	-
Bromophos	-		1.0000	0.0401	366.0000	0.8000	Yes	-
Bromopropane, 1-	0.1000	A	1.0000	0.0080	122.9900	1.0000	Yes	-
Bromoxynil	-		1.0000	0.0078	276.9200	0.9000	Yes	0.0015
Bromoxynil Octanoate	-		1.0000	0.0332	403.1200	0.8000	Yes	0.0015
Butadiene, 1,3-	0.0020	I	1.0000	0.0164	54.0920	1.0000	Yes	0.0003
Butanoic acid, 4-(2,4-dichlorophenoxy)-	-		1.0000	0.0139	249.1000	0.9000	Yes	-
Butanol, N-	-		1.0000	0.0023	74.1240	1.0000	Yes	-
Butyl Benzyl Phthalate	-		1.0000	0.0385	312.3700	0.9000	Yes	0.0819
Butyl Formate, tert-	-		1.0000	0.0026	102.1300	1.0000	Yes	-
Butyl alcohol, sec-	30.0000	P	1.0000	0.0015	74.1240	1.0000	Yes	-
Butylate	-		1.0000	0.0541	217.3800	1.0000	Yes	-
Butylated hydroxyanisole	-		1.0000	0.0325	360.5000	0.8000	Yes	0.7785
Butylated hydroxytoluene	-		1.0000	0.2230	220.3600	1.0000	Yes	0.0432
Butylbenzene, n-	-		1.0000	0.2250	134.2200	1.0000	No	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Butylbenzene, sec-	-		1.0000	0.3010	134.2200	1.0000	No	-
Butylbenzene, tert-	-		1.0000	0.1490	134.2200	1.0000	Yes	-
Butylphthalyl Butylglycolate	-		1.0000	0.0116	336.3900	0.9000	Yes	-
Cacodylic Acid	-		1.0000	0.0005	138.0000	1.0000	Yes	-
Cadmium (Water)	0.0000	A	0.0500	0.0010	112.4000	1.0000	Yes	-
Calcium Cyanide	-		1.0000	0.0010	92.1160	1.0000	Yes	-
Calcium pyrophosphate	-		1.0000	0.0010	254.1000	1.0000	Yes	-
Caprolactam	0.0022	C	1.0000	0.0010	113.1600	1.0000	Yes	-
Captafol	-		1.0000	0.0058	349.0600	0.9000	Yes	0.0010
Captan	-		1.0000	0.0023	300.5900	1.0000	Yes	0.0677
Carbaryl	-		1.0000	0.0043	201.2300	1.0000	Yes	-
Carbofuran	-		1.0000	0.0031	221.2600	1.0000	Yes	-
Carbon Disulfide	0.7000	I	1.0000	0.0114	76.1390	1.0000	Yes	-
Carbon Tetrachloride	0.1000	I	1.0000	0.0163	153.8200	1.0000	Yes	0.0022
Carbonyl Sulfide	0.1000	P	1.0000	0.0001	60.0750	1.0000	Yes	-
Carbosulfan	-		1.0000	0.0579	380.5500	0.8000	Yes	-
Carboxin	-		1.0000	0.0020	235.3100	1.0000	Yes	-
Ceric oxide	0.0009	I	1.0000	0.0010	172.1150	1.0000	Yes	-
Chloral	-		1.0000	0.0011	147.3900	1.0000	Yes	-
Chloral Hydrate	-		1.0000	0.0008	165.4000	1.0000	Yes	-
Chloramben	-		1.0000	0.0020	206.0300	1.0000	Yes	-
Chloranil	-		1.0000	0.0019	245.8800	1.0000	Yes	0.0004
Chlordane (technical mixture)	0.0007	I	1.0000	0.1070	409.7800	0.7000	Yes	0.0004
Chlordecone (Kepone)	-		1.0000	0.0109	490.6400	0.8000	Yes	0.0000
Chlorfenvinphos	-		1.0000	0.0051	359.5800	0.9000	Yes	-
Chlorimuron, Ethyl-	-		1.0000	0.0003	414.8300	1.0000	Yes	-
Chlorine	0.0001	A	1.0000	0.0010	70.9060	1.0000	Yes	-
Chlorine Dioxide	0.0002	I	1.0000	0.0010	67.4500	1.0000	Yes	-
Chlorite (Sodium Salt)	-		1.0000	0.0010	90.4400	1.0000	Yes	-
Chloro-1,1-difluoroethane, 1-	50.0000	I	1.0000	0.0099	100.5000	1.0000	Yes	-
Chloro-1,3-butadiene, 2-	0.0200	I	1.0000	0.0238	88.5370	1.0000	Yes	-
Chloro-2-methylaniline HCl, 4-	-		1.0000	0.0000	178.0600	1.0000	Yes	0.0003
Chloro-2-methylaniline, 4-	-		1.0000	0.0081	141.6000	1.0000	Yes	0.0016
Chloroacetaldehyde, 2-	-		1.0000	0.0007	78.4990	1.0000	Yes	0.0006
Chloroacetophenone, 2-	0.0000	I	1.0000	0.0041	154.6000	1.0000	Yes	-
Chloroaniline, p-	-		1.0000	0.0050	127.5700	1.0000	Yes	0.0008
Chlorobenzene	0.0500	P	1.0000	0.0282	112.5600	1.0000	Yes	-
Chlorobenzene sulfonic acid, p-	-		1.0000	0.0001	192.6200	1.0000	Yes	-
Chlorobenzilate	-		1.0000	0.0331	325.1900	0.8000	Yes	0.0014
Chlorobenzoic Acid, p-	-		1.0000	0.0120	156.5700	1.0000	Yes	-
Chlorobenzotrifluoride, 3-nitro-4-	-		1.0000	0.0159	225.5600	0.9000	Yes	-
Chlorobenzotrifluoride, 4-	0.3000	P	1.0000	0.0375	180.5600	1.0000	Yes	-
Chlorobutane, 1-	-		1.0000	0.0269	92.5690	1.0000	Yes	-
Chlorodifluoromethane	50.0000	I	1.0000	0.0027	86.4690	1.0000	Yes	-
Chloroethanol, 2-	-		1.0000	0.0006	80.5150	1.0000	Yes	-
Chloroform	0.0977	A	1.0000	0.0068	119.3800	1.0000	Yes	0.0050
Chloromethane	0.0900	I	1.0000	0.0033	50.4880	1.0000	Yes	-
Chloromethyl Methyl Ether	-		1.0000	0.0009	80.5150	1.0000	Yes	0.0001
Chloronaphthalene, Beta-	-		1.0000	0.0749	162.6200	1.0000	Yes	-
Chloronitrobenzene, o-	0.0000	X	1.0000	0.0063	157.5600	1.0000	Yes	0.0005
Chloronitrobenzene, p-	0.0020	P	1.0000	0.0079	157.5600	1.0000	Yes	0.0026
Chlorophenol, 2-	-		1.0000	0.0080	128.5600	1.0000	Yes	-
Chloropicrin	0.0004	C	1.0000	0.0046	164.3800	1.0000	Yes	-
Chlorothalonil	-		1.0000	0.0054	265.9100	0.9000	Yes	0.0092
Chlorotoluene, o-	-		1.0000	0.0572	126.5900	1.0000	Yes	-
Chlorotoluene, p-	-		1.0000	0.0498	126.5900	1.0000	Yes	-
Chlorozotocin	-		1.0000	0.0000	265.7000	1.0000	Yes	0.0000
Chlorpropham	-		1.0000	0.0213	213.6700	0.9000	Yes	-
Chlorpyrifos	-		1.0000	0.0334	350.5900	0.8000	Yes	-
Chlorpyrifos Methyl	-		1.0000	0.0178	322.5400	0.9000	Yes	-
Chlorsulfuron	-		1.0000	0.0003	357.7800	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Chlorthal-dimethyl	-		1.0000	0.0150	331.9700	0.9000	Yes	-
Chlorthiophos	-		1.0000	0.1060	361.2500	0.8000	Yes	-
Chromium(III), Insoluble Salts	-		0.0130	0.0010	52.0000	1.0000	Yes	-
Chromium(VI)	0.0001	I	0.0250	0.0020	52.0000	1.0000	Yes	0.0000
Chrysene	-		1.0000	0.5960	228.3000	1.0000	No	-
Clofentezine	-		1.0000	0.0036	303.1500	0.9000	Yes	-
Cobalt	0.0000	P	1.0000	0.0004	58.9300	1.0000	Yes	-
Copper	-		1.0000	0.0010	63.5460	1.0000	Yes	-
Copper Cyanide	-		1.0000	0.0010	89.5640	1.0000	Yes	-
Cresol, m-	0.6000	C	1.0000	0.0078	108.1400	1.0000	Yes	-
Cresol, o-	0.6000	C	1.0000	0.0077	108.1400	1.0000	Yes	-
Cresol, p-	0.6000	C	1.0000	0.0075	108.1400	1.0000	Yes	-
Cresol, p-chloro-m-	-		1.0000	0.0285	142.5900	1.0000	Yes	-
Cresols	0.6000	C	1.0000	0.0077	324.4200	0.9000	Yes	-
Crotonaldehyde, trans-	-		1.0000	0.0016	70.0920	1.0000	Yes	0.0001
Cumene	0.4000	I	1.0000	0.0897	120.2000	1.0000	Yes	-
Cupferron	-		1.0000	0.0000	155.1600	1.0000	Yes	0.0007
Cyanazine	-		1.0000	0.0021	240.7000	1.0000	Yes	0.0002
Cyanide (CN-)	0.0008	G	1.0000	0.0010	26.0180	1.0000	Yes	-
Cyanogen	-		1.0000	0.0009	52.0360	1.0000	Yes	-
Cyanogen Bromide	-		1.0000	0.0003	105.9300	1.0000	Yes	-
Cyanogen Chloride	-		1.0000	0.0004	61.4710	1.0000	Yes	-
Cyclohexane	6.0000	I	1.0000	0.1020	84.1630	1.0000	Yes	-
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	-		1.0000	0.0028	513.0900	0.9000	Yes	0.0078
Cyclohexanone	0.7000	P	1.0000	0.0015	98.1460	1.0000	Yes	-
Cyclohexene	1.0000	X	1.0000	0.0431	82.1470	1.0000	Yes	-
Cyclohexylamine	-		1.0000	0.0043	99.1770	1.0000	Yes	-
Cyclopentadiene	-		1.0000	0.0210	66.1040	1.0000	Yes	-
Cyfluthrin	-		1.0000	0.0515	434.3000	0.7000	Yes	-
Cyhalothrin	-		1.0000	0.2100	449.8600	0.5000	No	-
Cyromazine	-		1.0000	0.0008	166.1900	1.0000	Yes	-
DDD, p,p`- (DDD)	-		1.0000	0.2510	320.0500	0.8000	Yes	0.0006
DDE, p,p'-	-		1.0000	0.5450	318.0300	0.8000	No	-
DDT	-		1.0000	0.6280	354.4900	0.7000	No	-
Dalapon	-		1.0000	0.0008	142.9700	1.0000	Yes	-
Daminozide	-		1.0000	0.0000	160.1700	1.0000	Yes	0.0086
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	-		1.0000	0.7250	959.1700	0.0000	No	-
Decane	-		1.0000	0.5320	142.2900	1.0000	No	-
Demeton	-		1.0000	0.0076	516.6800	0.8000	Yes	-
Di(2-ethylhexyl)adipate	-		1.0000	3.2300	370.5800	0.0000	Yes	0.1297
Diallate	-		1.0000	0.0460	270.2200	0.9000	Yes	0.0026
Diammonium phosphate	-		1.0000	0.0010	132.0600	1.0000	Yes	-
Diazinon	-		1.0000	0.0104	304.3500	0.9000	Yes	-
Dibenz[a,h]anthracene	-		1.0000	0.9530	278.3600	0.6000	No	-
Dibenzo(a,e)pyrene	-		1.0000	4.1900	302.3800	0.3000	No	-
Dibenzofuran	-		1.0000	0.0975	168.2000	1.0000	Yes	-
Dibenzothiophene	-		1.0000	0.1180	184.2600	1.0000	Yes	-
Dibromo-3-chloropropane, 1,2-	0.0002	I	1.0000	0.0069	236.3300	1.0000	Yes	0.0001
Dibromobenzene, 1,3-	-		1.0000	0.0231	235.9100	0.9000	Yes	-
Dibromobenzene, 1,4-	-		1.0000	0.0245	235.9100	0.9000	Yes	-
Dibromochloromethane	-		1.0000	0.0029	208.2800	1.0000	Yes	0.0019
Dibromoethane, 1,2-	0.0090	I	1.0000	0.0028	187.8600	1.0000	Yes	0.0001
Dibromomethane (Methylene Bromide)	0.0040	X	1.0000	0.0022	173.8400	1.0000	Yes	-
Dibutyl Phthalate	-		1.0000	0.0420	278.3500	0.9000	Yes	-
Dibutyltin Compounds	-		1.0000	-	-	0.0000	No	-
Dibutyltin dichloride	-		1.0000	0.0003	303.8300	1.0000	Yes	-
Dicalcium phosphate	-		1.0000	0.0010	136.0600	1.0000	Yes	-
Dicamba	-		1.0000	0.0027	221.0400	1.0000	Yes	-
Dichloro-2-butene, 1,4-	-		1.0000	0.0166	125.0000	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Dichloro-2-butene, cis-1,4-	-		1.0000	0.0166	125.0000	1.0000	Yes	-
Dichloro-2-butene, trans-1,4-	-		1.0000	0.0166	125.0000	1.0000	Yes	-
Dichloroacetic Acid	-		1.0000	0.0012	128.9400	1.0000	Yes	0.0031
Dichlorobenzene, 1,2-	0.2000	H	1.0000	0.0446	147.0000	1.0000	Yes	-
Dichlorobenzene, 1,3-	-		1.0000	0.0520	147.0000	1.0000	Yes	-
Dichlorobenzene, 1,4-	0.8000	I	1.0000	0.0453	147.0000	1.0000	Yes	0.0288
Dichlorobenzidine, 3,3'-	-		1.0000	0.0128	253.1300	1.0000	Yes	0.0003
Dichlorobenzophenone, 4,4'-	-		1.0000	0.0542	251.1100	0.9000	Yes	-
Dichlorobenzotrifluoride, 3,4-	-		1.0000	0.0645	215.0000	1.0000	Yes	-
Dichlorodifluoromethane	0.1000	X	1.0000	0.0090	120.9100	1.0000	Yes	-
Dichlorodiisopropyl ether, 2,2'-	-		1.0000	0.0515	171.0700	1.0000	Yes	-
Dichloroethane, 1,1-	-		1.0000	0.0068	98.9600	1.0000	Yes	0.0273
Dichloroethane, 1,2-	0.0070	P	1.0000	0.0042	98.9600	1.0000	Yes	0.0017
Dichloroethylene, 1,1-	0.2000	I	1.0000	0.0117	96.9440	1.0000	Yes	-
Dichloroethylene, 1,2-cis-	-		1.0000	0.0110	96.9440	1.0000	Yes	-
Dichloroethylene, 1,2-trans-	-		1.0000	0.0110	96.9440	1.0000	Yes	-
Dichlorophenol, 2,4-	-		1.0000	0.0206	163.0000	1.0000	Yes	-
Dichlorophenoxy Acetic Acid, 2,4-	-		1.0000	0.0066	221.0400	1.0000	Yes	-
Dichloropropane, 1,2-	0.0040	I	1.0000	0.0075	112.9900	1.0000	Yes	0.0042
Dichloropropane, 1,3-	-		1.0000	0.0078	112.9900	1.0000	Yes	-
Dichloropropanol, 2,3-	-		1.0000	0.0010	128.9900	1.0000	Yes	-
Dichloropropene, 1,3-	0.0200	I	1.0000	0.0083	110.9700	1.0000	Yes	0.0016
Dichlorvos	0.0005	I	1.0000	0.0008	220.9800	1.0000	Yes	0.0005
Dicrotophos	-		1.0000	0.0001	237.1900	1.0000	Yes	-
Dicyclopentadiene	0.0003	X	1.0000	0.0360	132.2100	1.0000	Yes	-
Dieldrin	-		1.0000	0.0326	380.9100	0.8000	Yes	0.0000
Diethanolamine	0.0002	P	1.0000	0.0000	105.1400	1.0000	Yes	-
Diethyl Phthalate	-		1.0000	0.0036	222.2400	1.0000	Yes	-
Diethyl-meta-Toluamide, N,N (DEET)	-		1.0000	0.0037	191.2800	1.0000	Yes	-
Diethylene Glycol Monobutyl Ether	0.0001	P	1.0000	0.0005	162.2300	1.0000	Yes	-
Diethylene Glycol Monoethyl Ether	0.0003	P	1.0000	0.0001	134.1800	1.0000	Yes	-
Diethylformamide	-		1.0000	0.0005	101.1500	1.0000	Yes	-
Diethylstilbestrol	-		1.0000	0.1140	268.3600	0.9000	Yes	0.0000
Difenzoquat	-		1.0000	0.0000	360.4400	1.0000	Yes	-
Diflubenzuron	-		1.0000	0.0107	310.6900	0.9000	Yes	-
Difluoroethane, 1,1-	40.0000	I	1.0000	0.0021	66.0510	1.0000	Yes	-
Difluoropropane, 2,2-	30.0000	X	1.0000	0.0185	80.0780	1.0000	Yes	-
Dihydrosafrole	-		1.0000	0.0452	164.2100	1.0000	Yes	0.0035
Diisopropyl Ether	0.7000	P	1.0000	0.0043	102.1800	1.0000	Yes	-
Diisopropyl Methylphosphonate	-		1.0000	0.0007	180.1900	1.0000	Yes	-
Dimagnesium phosphate	-		1.0000	0.0010	174.3300	1.0000	Yes	-
Dimethipin	-		1.0000	0.0001	210.2700	1.0000	Yes	-
Dimethoate	-		1.0000	0.0003	229.2600	1.0000	Yes	-
Dimethoxybenzidine, 3,3'-	-		1.0000	0.0011	244.3000	1.0000	Yes	0.0001
Dimethyl methylphosphonate	-		1.0000	0.0001	124.0800	1.0000	Yes	0.0916
Dimethylamino azobenzene [p-]	-		1.0000	0.0943	225.3000	1.0000	Yes	0.0000
Dimethylaniline HCl, 2,4-	-		1.0000	0.0000	121.1800	1.0000	Yes	0.0003
Dimethylaniline, 2,4-	-		1.0000	0.0043	121.1800	1.0000	Yes	0.0008
Dimethylaniline, N,N-	-		1.0000	0.0112	121.1800	1.0000	Yes	0.0058
Dimethylbenz(a)anthracene, 7,12-	-		1.0000	0.4080	256.3500	0.9000	No	-
Dimethylbenzidine, 3,3'-	-		1.0000	0.0036	212.3000	1.0000	Yes	0.0000
Dimethylformamide	0.0300	I	1.0000	0.0001	73.0950	1.0000	Yes	-
Dimethylhydrazine, 1,1-	0.0000	X	1.0000	0.0001	60.0990	1.0000	Yes	-
Dimethylhydrazine, 1,2-	-		1.0000	0.0003	60.0990	1.0000	Yes	0.0000
Dimethylphenol, 2,4-	-		1.0000	0.0109	122.1700	1.0000	Yes	-
Dimethylphenol, 2,6-	-		1.0000	0.0120	122.1700	1.0000	Yes	-
Dimethylphenol, 3,4-	-		1.0000	0.0098	122.1700	1.0000	Yes	-
Dimethylphthalate	-		1.0000	0.0015	194.1900	1.0000	Yes	-
Dimethylterephthalate	-		1.0000	0.0040	194.1900	1.0000	Yes	-
Dimethylvinylchloride	-		1.0000	0.0253	90.5530	1.0000	Yes	0.0035
Dinitro-o-cresol, 4,6-	-		1.0000	0.0032	198.1400	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Dinitro-o-cyclohexyl Phenol, 4,6-	-		1.0000	0.0275	266.2600	0.9000	Yes	-
Dinitrobenzene, 1,2-	-		1.0000	0.0024	168.1100	1.0000	Yes	-
Dinitrobenzene, 1,3-	-		1.0000	0.0017	168.1100	1.0000	Yes	-
Dinitrobenzene, 1,4-	-		1.0000	0.0017	168.1100	1.0000	Yes	-
Dinitrophenol, 2,4-	-		1.0000	0.0019	184.1100	1.0000	Yes	-
Dinitrotoluene Mixture, 2,4/2,6-	-		1.0000	0.0042	182.1400	1.0000	Yes	0.0002
Dinitrotoluene, 2,4-	-		1.0000	0.0031	182.1400	1.0000	Yes	0.0005
Dinitrotoluene, 2,6-	-		1.0000	0.0037	182.1400	1.0000	Yes	0.0001
Dinitrotoluene, 2-Amino-4,6-	-		1.0000	0.0020	197.1500	1.0000	Yes	-
Dinitrotoluene, 4-Amino-2,6-	-		1.0000	0.0020	197.1500	1.0000	Yes	-
Dinitrotoluene, Technical grade	-		1.0000	0.0042	546.4100	0.8000	Yes	0.0003
Dinoseb	-		1.0000	0.0163	240.2200	0.9000	Yes	-
Dioxane, 1,4-	0.0300	I	1.0000	0.0003	88.1070	1.0000	Yes	0.0016
Diphenamid	-		1.0000	0.0056	239.3200	1.0000	Yes	-
Diphenyl Ether	0.0004	X	1.0000	0.1090	170.2100	1.0000	Yes	-
Diphenyl Sulfone	-		1.0000	0.0037	218.2800	1.0000	Yes	-
Diphenylamine	-		1.0000	0.0373	169.2300	1.0000	Yes	-
Diphenylhydrazine, 1,2-	-		1.0000	0.0130	184.2400	1.0000	Yes	0.0002
Dipotassium phosphate	-		1.0000	0.0010	174.1800	1.0000	Yes	-
Diquat	-		1.0000	0.0000	344.0500	1.0000	No	-
Direct Black 38	-		1.0000	0.0002	779.7700	1.0000	No	-
Direct Blue 6	-		1.0000	0.0000	932.7600	1.0000	No	-
Direct Brown 95	-		1.0000	0.0000	761.1200	1.0000	No	-
Disodium phosphate	-		1.0000	0.0010	141.9600	1.0000	Yes	-
Disulfoton	-		1.0000	0.0212	274.4100	0.9000	Yes	-
Dithiane, 1,4-	-		1.0000	0.0011	120.2400	1.0000	Yes	-
Diundecyl Phthalate	-		1.0000	146.0000	474.7300	0.0000	No	-
Diuron	-		1.0000	0.0047	233.1000	1.0000	Yes	-
Dodine	-		1.0000	0.0002	287.4500	1.0000	Yes	-
EPTC	-		1.0000	0.0184	189.3200	1.0000	Yes	-
Endosulfan	-		1.0000	0.0029	406.9300	0.9000	Yes	-
Endosulfan Sulfate	-		1.0000	0.0018	422.9300	0.9000	Yes	-
Endothall	-		1.0000	0.0026	186.1700	1.0000	Yes	-
Endrin	-		1.0000	0.0326	380.9100	0.8000	Yes	-
Epichlorohydrin	0.0010	I	1.0000	0.0009	92.5260	1.0000	Yes	0.0157
Epoxybutane, 1,2-	0.0200	I	1.0000	0.0023	72.1080	1.0000	Yes	-
Ethanol, 2-(2-methoxyethoxy)-	-		1.0000	0.0001	120.1500	1.0000	Yes	-
Ethephon	-		1.0000	0.0002	144.5000	1.0000	Yes	-
Ethion	-		1.0000	0.0255	384.4800	0.8000	Yes	-
Ethoxyethanol Acetate, 2-	0.0600	P	1.0000	0.0007	132.1600	1.0000	Yes	-
Ethoxyethanol, 2-	0.2000	I	1.0000	0.0003	90.1230	1.0000	Yes	-
Ethyl Acetate	0.0700	P	1.0000	0.0015	88.1070	1.0000	Yes	-
Ethyl Acrylate	0.0080	P	1.0000	0.0032	100.1200	1.0000	Yes	-
Ethyl Chloride	10.0000	I	1.0000	0.0061	64.5150	1.0000	Yes	-
Ethyl Ether	-		1.0000	0.0024	74.1240	1.0000	Yes	-
Ethyl Methacrylate	0.3000	P	1.0000	0.0070	114.1500	1.0000	Yes	-
Ethyl-p-nitrophenyl Phosphonate	-		1.0000	0.0361	323.3100	0.8000	Yes	-
Ethylbenzene	1.0000	I	1.0000	0.0493	106.1700	1.0000	Yes	0.0142
Ethylene Cyanohydrin	-		1.0000	0.0001	71.0790	1.0000	Yes	-
Ethylene Diamine	-		1.0000	0.0000	60.0990	1.0000	No	-
Ethylene Glycol	0.4000	C	1.0000	0.0001	62.0690	1.0000	Yes	-
Ethylene Glycol Monobutyl Ether	1.6000	I	1.0000	0.0012	118.1800	1.0000	Yes	-
Ethylene Oxide	0.0300	C	1.0000	0.0006	44.0540	1.0000	Yes	0.0002
Ethylene Thiourea	-		1.0000	0.0002	102.1600	1.0000	Yes	0.0035
Ethyleneimine	-		1.0000	0.0006	43.0690	1.0000	Yes	0.0000
Ethylphthalyl Ethyl Glycolate	-		1.0000	0.0012	280.2800	1.0000	Yes	-
Fenamiphos	-		1.0000	0.0044	303.3600	0.9000	Yes	-
Fenpropathrin	-		1.0000	0.1670	349.4300	0.8000	Yes	-
Fenvalerate	-		1.0000	0.0938	419.9100	0.7000	No	-
Fluometuron	-		1.0000	0.0032	232.2100	1.0000	Yes	-
Fluoranthene	-		1.0000	0.3080	202.2600	1.0000	No	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Fluorene	-		1.0000	0.1100	166.2200	1.0000	Yes	-
Fluoride	0.0130	C	1.0000	0.0010	38.0000	1.0000	Yes	-
Fluorine (Soluble Fluoride)	0.0130	C	1.0000	0.0010	37.9970	1.0000	Yes	-
Fluorobenzene	-		1.0000	0.0146	96.1050	1.0000	Yes	-
Fluridone	-		1.0000	0.0028	329.3200	0.9000	Yes	-
Flurprimidol	-		1.0000	0.0046	312.2900	0.9000	Yes	-
Flusilazole	-		1.0000	0.0077	315.4000	0.9000	Yes	-
Flutolanil	-		1.0000	0.0069	323.3200	0.9000	Yes	-
Fluvalinate	-		1.0000	0.0792	502.9300	0.6000	No	-
Folpet	-		1.0000	0.0027	296.5600	1.0000	Yes	-
Fomesafen	-		1.0000	0.0005	438.7700	1.0000	Yes	-
Fonofos	-		1.0000	0.0270	246.3300	0.9000	Yes	-
Formaldehyde	0.0098	A	1.0000	0.0018	30.0260	1.0000	Yes	0.0074
Formic Acid	0.0003	X	1.0000	0.0004	46.0260	1.0000	Yes	-
Fosetyl-AL	-		1.0000	0.0000	354.1100	1.0000	No	-
Furan	-		1.0000	0.0051	68.0760	1.0000	Yes	-
Furazolidone	-		1.0000	0.0001	225.1600	1.0000	Yes	0.0000
Furfural	0.0500	H	1.0000	0.0008	96.0860	1.0000	Yes	-
Furium	-		1.0000	0.0009	253.2300	1.0000	Yes	0.0001
Furmecyclox	-		1.0000	0.0499	251.3300	0.9000	Yes	0.0052
Gadolinium	-		1.0000	0.0010	157.2500	1.0000	Yes	-
Glufosinate, Ammonium	-		1.0000	0.0000	198.1600	1.0000	No	-
Glutaraldehyde	0.0001	C	1.0000	0.0003	100.1200	1.0000	Yes	-
Glycidyl	0.0010	H	1.0000	0.0005	72.0640	1.0000	Yes	-
Glyphosate	-		1.0000	0.0000	169.0700	1.0000	No	-
Guanidine	-		1.0000	0.0001	59.0710	1.0000	Yes	-
Guanidine Chloride	-		1.0000	0.0000	95.5320	1.0000	No	-
Guanidine Nitrate	-		1.0000	0.0000	122.1100	1.0000	No	-
Haloxyfop, Methyl	-		1.0000	0.0060	375.7300	0.9000	Yes	-
Heptachlor	-		1.0000	0.1430	373.3200	0.8000	Yes	0.0000
Heptachlor Epoxide	-		1.0000	0.0209	389.3200	0.8000	Yes	0.0000
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	0.0013	W	1.0000	2.9600	395.3300	0.0000	No	-
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	0.0000	W	1.0000	1.4500	409.3100	0.0000	No	-
Heptanal, n-	0.0030	X	1.0000	0.0119	114.1900	1.0000	Yes	-
Heptane, N-	0.4000	P	1.0000	0.5370	100.2100	1.0000	No	-
Hexabromobenzene	-		1.0000	0.0136	551.4900	0.7000	No	-
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	-		1.0000	-	643.5836	0.0000	No	-
Hexachlorobenzene	-		1.0000	0.2540	284.7800	0.9000	No	-
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	0.0013	W	1.0000	1.4300	360.8800	0.0000	No	-
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	0.0013	W	1.0000	1.6600	360.8800	0.0000	No	-
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	0.0013	W	1.0000	1.6600	360.8800	0.0000	No	-
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	0.0000	W	1.0000	1.2400	360.8800	0.1000	No	-
Hexachlorobutadiene	-		1.0000	0.0810	260.7600	0.9000	Yes	0.0020
Hexachlorocyclohexane, Alpha-	-		1.0000	0.0206	290.8300	0.9000	Yes	0.0000
Hexachlorocyclohexane, Beta-	-		1.0000	0.0206	290.8300	0.9000	Yes	0.0001
Hexachlorocyclohexane, Gamma- (Lindane)	-		1.0000	0.0206	290.8300	0.9000	Yes	0.0001
Hexachlorocyclohexane, Technical	-		1.0000	0.0206	290.8300	0.9000	Yes	0.0001
Hexachlorocyclopentadiene	0.0002	I	1.0000	0.1030	272.7700	0.9000	Yes	-
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	0.0000	W	1.0000	1.5300	390.8700	0.0000	No	-
Hexachlorodibenzo-p-dioxin, Mixture	-		1.0000	2.8600	390.8700	0.0000	No	-
Hexachlorodibenzofuran, 1,2,3,4,7,8-	0.0000	W	1.0000	2.2500	374.8700	0.0000	No	-
Hexachloroethane	0.0300	I	1.0000	0.0415	236.7400	1.0000	Yes	0.0039
Hexachlorophene	-		1.0000	0.8360	406.9100	0.0000	No	-
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	-		1.0000	0.0003	222.1200	1.0000	Yes	0.0019
Hexamethylene Diisocyanate, 1,6-	0.0000	I	1.0000	0.0237	168.2000	1.0000	Yes	-
Hexamethylene diisocyanate biuret	0.0004	C	1.0000	0.3520	478.6000	0.0000	No	-
Hexamethylene diisocyanate isocyanurate	0.0004	C	1.0000	7.6800	504.5900	0.0000	No	-
Hexamethylphosphoramide	-		1.0000	0.0002	179.2000	1.0000	Yes	-
Hexane, Commercial	0.6000	P	1.0000	0.2010	86.1780	1.0000	Yes	-
Hexane, N-	0.7000	I	1.0000	0.2010	86.1780	1.0000	Yes	-
Hexanedioic Acid	-		1.0000	0.0003	146.1400	1.0000	Yes	-

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Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	0.0004	P	1.0000	0.0190	130.2300	1.0000	Yes	0.0164
Hexanone, 2-	0.0300	I	1.0000	0.0036	100.1600	1.0000	Yes	-
Hexazinone	-		1.0000	0.0010	252.3200	1.0000	Yes	-
Hexythiazox	-		1.0000	0.0828	352.8900	0.8000	Yes	-
HpCDD, 1,2,3,4,6,7,8,-	0.0000	W	1.0000	1.3300	425.3100	0.0000	No	-
HpCDF, 1,2,3,4,7,8,9-	0.0000	W	1.0000	1.4500	409.3100	0.0000	No	-
HxCDD, 1,2,3,6,7,8-	0.0000	W	1.0000	2.8600	390.8700	0.0000	No	-
HxCDD, 1,2,3,7,8,9-	0.0000	W	1.0000	2.8600	390.8700	0.0000	No	-
HxCDF, 1,2,3,6,7,8-	0.0000	W	1.0000	2.2500	374.8700	0.0000	No	-
HxCDF, 1,2,3,7,8,9-	0.0000	W	1.0000	1.3500	374.8700	0.0000	No	-
HxCDF, 2,3,4,6,7,8-	0.0000	W	1.0000	2.2500	374.8700	0.0000	No	-
Hydramethylnon	-		1.0000	0.0001	494.4900	1.0000	Yes	-
Hydrazine	0.0000	P	1.0000	0.0000	32.0450	1.0000	Yes	0.0001
Hydrazine Sulfate	-		1.0000	0.0010	128.1000	1.0000	Yes	0.0001
Hydrogen Chloride	0.0200	I	1.0000	0.0010	35.4500	1.0000	Yes	-
Hydrogen Cyanide	0.0008	I	1.0000	0.0010	27.0260	1.0000	Yes	-
Hydrogen Fluoride	0.0140	C	1.0000	0.0010	20.0060	1.0000	Yes	-
Hydrogen Sulfide	0.0020	I	1.0000	0.0010	34.0800	1.0000	Yes	-
Hydroquinone	-		1.0000	0.0009	110.1100	1.0000	Yes	0.0026
Imazalil	-		1.0000	0.0116	297.1900	0.9000	Yes	0.0025
Imazaquin	-		1.0000	0.0005	311.3400	1.0000	Yes	-
Imazethapyr	-		1.0000	0.0020	289.3400	1.0000	Yes	-
Indeno[1,2,3-cd]pyrene	-		1.0000	1.2400	276.3400	0.6000	No	-
Iodine	-		1.0000	0.0010	253.8100	1.0000	Yes	-
Iprodione	-		1.0000	0.0022	330.1700	0.9000	Yes	-
Iron	-		1.0000	0.0010	55.8470	1.0000	Yes	-
Isobutyl Alcohol	-		1.0000	0.0019	74.1240	1.0000	Yes	-
Isophorone	2.0000	C	1.0000	0.0035	138.2100	1.0000	Yes	0.1639
Isopropalin	-		1.0000	0.2070	309.3700	0.8000	Yes	-
Isopropanol	0.2000	P	1.0000	0.0008	60.0970	1.0000	Yes	-
Isopropyl Methyl Phosphonic Acid	-		1.0000	0.0004	138.1000	1.0000	Yes	-
Isoxaben	-		1.0000	0.0089	332.4000	0.9000	Yes	-
JP-4	-		1.0000	-	-	0.0000	No	-
JP-5	-		1.0000	-	-	0.0000	No	-
JP-7	0.3000	A	1.0000	-	-	0.0000	No	-
JP-8	-		1.0000	-	-	0.0000		-
Kerosene	-		1.0000	-	-	0.0000	No	-
Lactofen	-		1.0000	0.0063	461.7800	0.9000	Yes	-
Lactonitrile	-		1.0000	0.0001	71.0790	1.0000	Yes	-
Lanthanum	-		1.0000	0.0010	138.9100	1.0000	Yes	-
Lanthanum Acetate Hydrate	-		1.0000	-	334.0500	0.0000	No	-
Lanthanum Chloride Heptahydrate	-		1.0000	0.0010	371.3710	1.0000	Yes	-
Lanthanum Chloride, Anhydrous	-		1.0000	0.0010	245.2600	1.0000	Yes	-
Lanthanum Nitrate Hexahydrate	-		1.0000	0.0010	433.0110	0.9000	Yes	-
Lead Phosphate	-		1.0000	0.0010	811.5100	0.8000	Yes	0.0183
Lead acetate	-		1.0000	0.0000	327.3000	1.0000	Yes	0.0007
Lead subacetate	-		1.0000	0.0000	805.6700	1.0000	No	-
Lewisite	-		1.0000	0.0054	207.3200	1.0000	Yes	-
Linuron	-		1.0000	0.0084	249.1000	0.9000	Yes	-
Lithium	-		1.0000	0.0010	6.9400	1.0000	Yes	-
Lithium Perchlorate	-		1.0000	0.0010	106.3920	1.0000	Yes	-
Lutetium	-		1.0000	0.0002	174.9700	1.0000	Yes	-
MCPA	-		1.0000	0.0169	200.6200	1.0000	Yes	-
MCPB	-		1.0000	0.0173	228.6800	0.9000	Yes	-
MCPP	-		1.0000	0.0131	214.6500	1.0000	Yes	-
Malathion	-		1.0000	0.0008	330.3600	1.0000	Yes	-
Maleic Anhydride	0.0007	C	1.0000	0.0053	98.0590	1.0000	Yes	-
Maleic Hydrazide	-		1.0000	0.0001	112.0900	1.0000	Yes	-
Malononitrile	-		1.0000	0.0003	66.0630	1.0000	Yes	-
Mancozeb	-		1.0000	0.0008	541.0300	0.9000	Yes	-
Maneb	-		1.0000	0.0008	295.3700	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Manganese (Non-diet)	0.0001	I	0.0400	0.0010	54.9380	1.0000	Yes	-
Mephosfolan	-		1.0000	0.0002	269.3200	1.0000	Yes	-
Mepiquat Chloride	-		1.0000	0.0000	149.6700	1.0000	No	-
Mercaptobenzothiazole, 2-	-		1.0000	0.0073	167.2500	1.0000	Yes	0.0142
Mercuric Chloride	0.0003	G	0.0700	0.0010	271.5000	1.0000	Yes	-
Mercury (elemental)	0.0003	I	1.0000	0.0010	200.5900	1.0000	Yes	-
Merphos	-		1.0000	4.1500	298.5100	0.3000	No	-
Merphos Oxide	-		1.0000	0.1650	314.5100	0.9000	Yes	-
Metalaxyl	-		1.0000	0.0006	279.3400	1.0000	Yes	-
Methacrylonitrile	0.0300	P	1.0000	0.0019	67.0910	1.0000	Yes	-
Methamidophos	-		1.0000	0.0001	141.1300	1.0000	Yes	-
Methanol	20.0000	I	1.0000	0.0003	32.0420	1.0000	Yes	-
Methidathion	-		1.0000	0.0009	302.3300	1.0000	Yes	-
Methomyl	-		1.0000	0.0005	162.2100	1.0000	Yes	-
Methoxy-5-nitroaniline, 2-	-		1.0000	0.0017	168.1500	1.0000	Yes	0.0032
Methoxychlor	-		1.0000	0.0428	345.6600	0.8000	Yes	-
Methoxyethanol Acetate, 2-	0.0010	P	1.0000	0.0004	118.1300	1.0000	Yes	-
Methoxyethanol, 2-	0.0200	I	1.0000	0.0002	76.0960	1.0000	Yes	-
Methyl Acetate	-		1.0000	0.0008	74.0800	1.0000	Yes	-
Methyl Acrylate	0.0200	P	1.0000	0.0018	86.0910	1.0000	Yes	-
Methyl Ethyl Ketone (2-Butanone)	5.0000	I	1.0000	0.0010	72.1080	1.0000	Yes	-
Methyl Hydrazine	0.0000	X	1.0000	0.0002	46.0720	1.0000	Yes	-
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	3.0000	I	1.0000	0.0032	100.1600	1.0000	Yes	-
Methyl Isocyanate	0.0010	C	1.0000	0.0025	57.0520	1.0000	Yes	-
Methyl Mercury	-		1.0000	0.0010	216.6326	1.0000	Yes	-
Methyl Methacrylate	0.7000	I	1.0000	0.0036	100.1200	1.0000	Yes	-
Methyl Parathion	-		1.0000	0.0042	263.2100	1.0000	Yes	-
Methyl Phosphonic Acid	-		1.0000	0.0001	96.0230	1.0000	Yes	-
Methyl Styrene (Mixed Isomers)	0.0400	H	1.0000	0.0660	354.5400	0.8000	Yes	-
Methyl methanesulfonate	-		1.0000	0.0001	110.1300	1.0000	Yes	0.0016
Methyl tert-Butyl Ether (MTBE)	3.0000	I	1.0000	0.0021	88.1510	1.0000	Yes	0.0865
Methyl-1,4-benzenediamine dihydrochloride, 2-	-		1.0000	0.0000	195.0900	1.0000	Yes	-
Methyl-2-Pentanol, 4-	3.0000	X	1.0000	0.0054	102.1800	1.0000	Yes	-
Methyl-5-Nitroaniline, 2-	-		1.0000	0.0038	152.1500	1.0000	Yes	0.0173
Methyl-N-nitro-N-nitrosoguanidine, N-	-		1.0000	0.0001	147.0900	1.0000	Yes	0.0000
Methylaniline Hydrochloride, 2-	-		1.0000	0.0000	143.6200	1.0000	Yes	0.0012
Methylarsonic acid	-		1.0000	0.0000	139.9700	1.0000	Yes	-
Methylbenzene,1-4-diamine monohydrochloride, 2-	-		1.0000	-	158.6286	0.0000	No	-
Methylbenzene-1,4-diamine sulfate, 2-	-		1.0000	-	220.2500	0.0000	No	-
Methylcholanthrene, 3-	-		1.0000	0.9030	268.3600	0.8000	No	-
Methylcyclopentane	-		1.0000	0.0917	84.1630	1.0000	Yes	-
Methylene Chloride	0.6000	I	1.0000	0.0035	84.9330	1.0000	Yes	0.0248
Methylene-bis(2-chloroaniline), 4,4'-	-		1.0000	0.0197	267.1600	0.9000	Yes	0.0005
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	-		1.0000	0.0470	254.3800	1.0000	Yes	0.0034
Methylenebisbenzenamine, 4,4'-	0.0200	C	1.0000	0.0014	198.2700	1.0000	Yes	0.0001
Methylenediphenyl Diisocyanate	0.0006	I	1.0000	0.1810	250.2600	0.9000	Yes	-
Methylnaphthalene, 1-	-		1.0000	0.0931	142.2000	1.0000	Yes	0.0054
Methylnaphthalene, 2-	-		1.0000	0.0917	142.2000	1.0000	Yes	-
Methylstyrene, Alpha-	-		1.0000	0.0699	118.1800	1.0000	Yes	-
Metolachlor	-		1.0000	0.0034	283.8000	1.0000	Yes	-
Metribuzin	-		1.0000	0.0013	214.2900	1.0000	Yes	-
Metsulfuron-methyl	-		1.0000	0.0003	381.3700	1.0000	Yes	-
Mineral oils	-		1.0000	1.9600	170.3400	1.0000	No	-
Mirex	-		1.0000	0.0516	545.5500	0.5000	No	-
Molinate	-		1.0000	0.0189	187.3100	1.0000	Yes	-
Molybdenum	-		1.0000	0.0010	95.9400	1.0000	Yes	-
Monoaluminum phosphate	-		1.0000	0.0010	317.9400	1.0000	Yes	-
Monoammonium phosphate	-		1.0000	0.0010	115.0300	1.0000	Yes	-
Monobutyltin Compounds	-		1.0000	-	-	0.0000	No	-
Monocalcium phosphate	-		1.0000	0.0010	234.0500	1.0000	Yes	-
Monochloramine	-		1.0000	0.0010	51.4800	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Monomagnesium phosphate	-		1.0000	0.0010	120.2800	1.0000	Yes	-
Monomethylaniline	-		1.0000	0.0050	107.1600	1.0000	Yes	-
Monopotassium phosphate	-		1.0000	0.0010	136.0900	1.0000	Yes	-
Monosodium phosphate	-		1.0000	0.0010	119.9800	1.0000	Yes	-
Myclobutanil	-		1.0000	0.0034	274.7600	1.0000	Yes	-
N,N'-Diphenyl-1,4-benzenediamine	-		1.0000	0.0262	260.3400	0.9000	Yes	-
Naled	-		1.0000	0.0001	380.7900	1.0000	Yes	-
Naphtha, High Flash Aromatic (HFAN)	0.1000	P	1.0000	-	-	0.0000	No	-
Naphthalene	0.0030	I	1.0000	0.0466	128.1800	1.0000	Yes	0.0013
Naphthylamine, 2-	-		1.0000	0.0081	143.1900	1.0000	Yes	0.0001
Napropamide	-		1.0000	0.0080	271.3600	0.9000	Yes	-
Neodymium Chloride (Stable, Nonradioactive)	-		1.0000	0.0010	250.6000	1.0000	Yes	-
Nickel Acetate	0.0000	C	1.0000	0.0000	176.8000	1.0000	Yes	0.0002
Nickel Carbonate	0.0000	C	1.0000	0.0000	118.7200	1.0000	Yes	0.0002
Nickel Carbonyl	0.0000	C	1.0000	-	170.7340	0.0000	Yes	0.0002
Nickel Hydroxide	0.0000	C	0.0400	0.0010	92.7081	1.0000	Yes	0.0000
Nickel Oxide	0.0000	C	0.0400	0.0010	74.6900	1.0000	Yes	0.0000
Nickel Refinery Dust	0.0000	C	0.0400	0.0002	-	0.0000	Yes	0.0000
Nickel Soluble Salts	0.0001	A	0.0400	0.0002	58.7100	1.0000	Yes	-
Nickel Subsulfide	0.0000	C	0.0400	0.0002	240.2100	1.0000	Yes	0.0000
Nickelocene	0.0000	C	1.0000	-	188.8790	0.0000	Yes	0.0002
Nitrate (measured as nitrogen)	-		1.0000	0.0010	62.0000	1.0000	Yes	-
Nitrite (measured as nitrogen)	-		1.0000	0.0010	47.0100	1.0000	Yes	-
Nitroaniline, 2-	0.0001	X	1.0000	0.0045	138.1300	1.0000	Yes	-
Nitroaniline, 3-	-		1.0000	0.0021	138.1300	1.0000	Yes	-
Nitroaniline, 4-	0.0060	P	1.0000	0.0022	138.1300	1.0000	Yes	0.0078
Nitrobenzene	0.0090	I	1.0000	0.0054	123.1100	1.0000	Yes	-
Nitrocellulose	-		1.0000	0.0000	387.3000	1.0000	No	-
Nitrofurantoin	-		1.0000	0.0000	238.1600	1.0000	Yes	-
Nitrofurazone	-		1.0000	0.0002	198.1400	1.0000	Yes	0.0001
Nitroglycerin	-		1.0000	0.0010	227.0900	1.0000	Yes	0.0092
Nitroguanidine	-		1.0000	0.0001	104.0700	1.0000	Yes	-
Nitromethane	0.0050	P	1.0000	0.0004	61.0410	1.0000	Yes	-
Nitrophenol, 2-	-		1.0000	0.0040	139.1100	1.0000	Yes	-
Nitropropane, 2-	0.0200	I	1.0000	0.0021	89.0950	1.0000	Yes	-
Nitropyrene, 4-	-		1.0000	0.0922	249.2700	0.9000	Yes	0.0001
Nitroso-N-ethylurea, N-	-		1.0000	0.0005	117.1100	1.0000	Yes	0.0000
Nitroso-N-methylurea, N-	-		1.0000	0.0004	103.0800	1.0000	Yes	0.0000
Nitroso-di-N-butylamine, N-	-		1.0000	0.0113	158.2500	1.0000	Yes	0.0000
Nitroso-di-N-propylamine, N-	-		1.0000	0.0023	130.1900	1.0000	Yes	0.0000
Nitrosodiethanolamine, N-	-		1.0000	0.0000	134.1400	1.0000	Yes	0.0001
Nitrosodiethylamine, N-	-		1.0000	0.0009	102.1400	1.0000	Yes	0.0000
Nitrosodimethylamine, N-	0.0000	X	1.0000	0.0003	74.0830	1.0000	Yes	0.0000
Nitrosodiphenylamine, N-	-		1.0000	0.0145	198.2300	1.0000	Yes	0.0318
Nitrosomethylethylamine, N-	-		1.0000	0.0005	88.1100	1.0000	Yes	0.0000
Nitrosomorpholine [N-]	-		1.0000	0.0002	116.1200	1.0000	Yes	0.0000
Nitrosopiperidine [N-]	-		1.0000	0.0006	114.1500	1.0000	Yes	0.0000
Nitrosopyrrolidine, N-	-		1.0000	0.0003	100.1200	1.0000	Yes	0.0001
Nitrotoluene, m-	-		1.0000	0.0113	137.1400	1.0000	Yes	-
Nitrotoluene, o-	-		1.0000	0.0090	137.1400	1.0000	Yes	0.0007
Nitrotoluene, p-	-		1.0000	0.0100	137.1400	1.0000	Yes	0.0097
Nonane, n-	0.0200	P	1.0000	1.7000	128.2600	1.0000	No	-
Norflurazon	-		1.0000	0.0011	303.6700	1.0000	Yes	-
OCDD	0.0001	W	1.0000	1.1600	459.7600	0.0000	No	-
OCDF	0.0001	W	1.0000	2.6300	443.7600	0.0000	No	-
Octabromodiphenyl Ether	-		1.0000	0.0306	801.3800	0.3000	No	-
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	-		1.0000	0.0000	296.1600	1.0000	Yes	-
Octamethylpyrophosphoramide	-		1.0000	0.0000	286.2500	1.0000	Yes	-
Octyl Phthalate, di-N-	-		1.0000	2.4300	390.5700	0.0000	No	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Oryzalin	-		1.0000	0.0054	346.3600	0.9000	Yes	0.0200
Oxadiazon	-		1.0000	0.0280	345.2300	0.8000	Yes	-
Oxamyl	-		1.0000	0.0000	219.2600	1.0000	Yes	-
Oxyfluorfen	-		1.0000	0.0204	361.7100	0.8000	Yes	0.0021
Paclobutrazol	-		1.0000	0.0047	293.8000	0.9000	Yes	-
Paraquat Dichloride	-		1.0000	0.0000	257.1600	1.0000	No	-
Parathion	-		1.0000	0.0128	291.2600	0.9000	Yes	-
PeCDF, 1,2,3,7,8-	0.0000	W	1.0000	0.6270	340.4200	0.4000	No	-
PeCDF, 2,3,4,7,8-	0.0000	W	1.0000	0.6270	340.4200	0.4000	No	-
Pebulate	-		1.0000	0.0397	203.3500	1.0000	Yes	-
Pendimethalin	-		1.0000	0.1150	281.3100	0.9000	Yes	-
Pentabromodiphenyl Ether	-		1.0000	0.0373	564.6900	0.6000	No	-
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	-		1.0000	0.0373	564.6900	0.6000	No	-
Pentachlorobenzene	-		1.0000	0.1680	250.3400	0.9000	Yes	-
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	0.0013	W	1.0000	1.0000	326.4400	0.4000	No	-
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	0.0013	W	1.0000	1.2400	326.4400	0.3000	No	-
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	0.0013	W	1.0000	0.7510	326.4400	0.5000	No	-
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	0.0013	W	1.0000	1.0000	326.4400	0.4000	No	-
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	0.0000	W	1.0000	1.0000	326.4400	0.4000	No	-
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	0.0000	W	1.0000	0.4050	356.4200	0.5000	No	-
Pentachloroethane	-		1.0000	0.0158	202.3000	1.0000	Yes	0.0017
Pentachloronitrobenzene	-		1.0000	0.0418	295.3400	0.9000	Yes	0.0006
Pentachlorophenol	-		1.0000	0.1270	266.3400	0.9000	Yes	0.0004
Pentaerythritol tetranitrate (PETN)	-		1.0000	0.0010	316.1400	1.0000	Yes	0.0389
Pentane, n-	1.0000	P	1.0000	0.1100	72.1510	1.0000	Yes	-
Perchlorate and Perchlorate Salts	-		1.0000	0.0010	117.4900	1.0000	Yes	-
Perfluorobutane sulfonic acid (PFBS)	-		1.0000	-	300.1000	0.0000	Yes	-
Perfluorobutanesulfonate	-		1.0000	-	299.1000	0.0000	Yes	-
Perfluorooctane sulfonic acid (PFOS)	-		1.0000	-	500.1300	0.0000	No	-
Perfluorooctanesulfonate	-		1.0000	-	499.1300	0.0000	No	-
Perfluorooctanoic acid (PFOA)	-		1.0000	-	414.0700	0.0000	No	-
Permethrin	-		1.0000	0.2080	391.3000	0.6000	No	-
Phenacetin	-		1.0000	0.0017	179.2200	1.0000	Yes	0.0708
Phenmedipham	-		1.0000	0.0079	300.3200	0.9000	Yes	-
Phenol	0.2000	C	1.0000	0.0043	94.1140	1.0000	Yes	-
Phenol, 2-(1-methylethoxy)-, methylcarbamate	-		1.0000	0.0011	209.2500	1.0000	Yes	-
Phenothiazine	-		1.0000	0.0683	199.2800	1.0000	Yes	-
Phenyl Isothiocyanate	-		1.0000	0.0413	135.1900	1.0000	Yes	-
Phenylenediamine, m-	-		1.0000	0.0002	108.1400	1.0000	Yes	-
Phenylenediamine, o-	-		1.0000	0.0005	108.1400	1.0000	Yes	0.0013
Phenylenediamine, p-	-		1.0000	0.0002	108.1400	1.0000	Yes	-
Phenylmercuric Acetate	-		1.0000	0.0001	336.7400	1.0000	Yes	-
Phenylphenol, 2-	-		1.0000	0.0196	170.2100	1.0000	Yes	0.0803
Phorate	-		1.0000	0.0126	260.3800	0.9000	Yes	-
Phosgene	0.0003	I	1.0000	0.0001	98.9170	1.0000	Yes	-
Phosmet	-		1.0000	0.0018	317.3200	1.0000	Yes	-
Phosphine	0.0003	I	1.0000	0.0010	33.9980	1.0000	Yes	-
Phosphoric Acid	0.0100	I	1.0000	0.0010	97.9950	1.0000	Yes	-
Phosphorus, White	-		1.0000	0.0010	30.9740	1.0000	Yes	-
Phthalic Acid, P-	-		1.0000	0.0039	166.1300	1.0000	Yes	-
Phthalic Anhydride	0.0200	C	1.0000	0.0027	148.1200	1.0000	Yes	-
Picloram	-		1.0000	0.0013	241.4600	1.0000	Yes	-
Picramic Acid (2-Amino-4,6-dinitrophenol)	-		1.0000	0.0005	199.1200	1.0000	Yes	-
Picric Acid (2,4,6-Trinitrophenol)	-		1.0000	0.0006	229.1100	1.0000	Yes	-
Pirimiphos, Methyl	-		1.0000	0.0187	305.3400	0.9000	Yes	-
Polybrominated Biphenyls	-		1.0000	-	-	0.0000	No	-
Polychlorinated Biphenyls (low risk)	-		1.0000	0.5450	291.9900	0.7000	No	-
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	0.0006	I	1.0000	18.6000	512.5300	0.0000	No	-
Polyphosphoric acid	-		1.0000	0.0010	257.9600	1.0000	Yes	-
Potassium Cyanide	-		1.0000	0.0020	65.1200	1.0000	Yes	-
Potassium Perchlorate	-		1.0000	0.0020	138.5500	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Potassium Perfluorobutane Sulfonate	-		1.0000	-	338.1900	0.0000	Yes	-
Potassium Perfluorooctane Sulfonate	-		1.0000	-	538.2200	0.0000	No	-
Potassium Silver Cyanide	-		0.0400	0.0020	199.0100	1.0000	Yes	-
Potassium tripolyphosphate	-		1.0000	0.0010	448.4068	0.9000	Yes	-
Praseodymium Chloride (Stable, Nonradioactive)	-		1.0000	0.0010	247.2700	1.0000	Yes	-
Prochloraz	-		1.0000	0.0064	376.6700	0.9000	Yes	0.0010
Profluralin	-		1.0000	0.0900	347.3000	0.8000	Yes	-
Prometon	-		1.0000	0.0083	225.3000	1.0000	Yes	-
Prometryn	-		1.0000	0.0149	241.3600	0.9000	Yes	-
Pronamide	-		1.0000	0.0109	256.1300	0.9000	Yes	-
Propachlor	-		1.0000	0.0029	211.6900	1.0000	Yes	-
Propanil	-		1.0000	0.0103	218.0800	1.0000	Yes	-
Propargite	-		1.0000	0.0356	350.4800	0.8000	Yes	0.0008
Propargyl Alcohol	-		1.0000	0.0004	56.0650	1.0000	Yes	-
Propazine	-		1.0000	0.0071	229.7100	1.0000	Yes	-
Propham	-		1.0000	0.0083	179.2200	1.0000	Yes	-
Propiconazole	-		1.0000	0.0056	342.2300	0.9000	Yes	-
Propionaldehyde	0.0080	I	1.0000	0.0018	58.0810	1.0000	Yes	-
Propyl benzene	1.0000	X	1.0000	0.0939	120.2000	1.0000	Yes	-
Propylene	3.0000	C	1.0000	0.0136	42.0810	1.0000	Yes	-
Propylene Glycol	-		1.0000	0.0001	76.0960	1.0000	Yes	-
Propylene Glycol Dinitrate	0.0003	A	1.0000	0.0021	166.0900	1.0000	Yes	-
Propylene Glycol Monomethyl Ether	2.0000	I	1.0000	0.0002	90.1230	1.0000	Yes	-
Propylene Oxide	0.0300	I	1.0000	0.0008	58.0810	1.0000	Yes	0.0006
Pyrene	-		1.0000	0.2010	202.2600	1.0000	Yes	-
Pyridine	-		1.0000	0.0015	79.1020	1.0000	Yes	-
Quinalphos	-		1.0000	0.0296	298.3000	0.9000	Yes	-
Quinoline	-		1.0000	0.0066	129.1600	1.0000	Yes	0.0001
Quizalofop-ethyl	-		1.0000	0.0089	372.8100	0.9000	Yes	-
Resmethrin	-		1.0000	0.2380	338.4500	0.7000	Yes	-
Ronnel	-		1.0000	0.0430	321.5500	0.8000	Yes	-
Rotenone	-		1.0000	0.0051	394.4300	0.9000	Yes	-
Rubidium	-		1.0000	0.0010	85.4700	1.0000	Yes	-
Rubidium Chloride	-		1.0000	0.0010	120.9200	1.0000	Yes	-
Rubidium Hydroxide	-		1.0000	0.0010	102.4800	1.0000	Yes	-
Rubidium Iodide	-		1.0000	0.0010	212.3700	1.0000	Yes	-
Safrole	-		1.0000	0.0113	162.1900	1.0000	Yes	0.0002
Samarium Chloride (Stable, Nonradioactive)	-		1.0000	0.0010	256.7200	1.0000	Yes	-
Samarium Nitrate (Stable, Nonradioactive)	-		1.0000	0.0010	336.3800	1.0000	Yes	-
Selenious Acid	-		1.0000	0.0010	128.9700	1.0000	Yes	-
Selenium	0.0200	C	1.0000	0.0010	78.9600	1.0000	Yes	-
Selenium Sulfide	0.0200	C	1.0000	0.0010	111.0200	1.0000	Yes	-
Sethoxydim	-		1.0000	0.0185	327.4900	0.9000	Yes	-
Silica (crystalline, respirable)	0.0030	C	1.0000	0.0010	60.0800	1.0000	Yes	-
Silver	-		0.0400	0.0006	107.8700	1.0000	Yes	-
Silver Cyanide	-		0.0400	0.0010	133.8900	1.0000	Yes	-
Simazine	-		1.0000	0.0033	201.6600	1.0000	Yes	0.0013
Sodium Acifluorfen	-		1.0000	0.0000	383.6500	1.0000	Yes	-
Sodium Azide	-		1.0000	0.0010	65.0100	1.0000	Yes	-
Sodium Cyanide	-		1.0000	0.0010	49.0080	1.0000	Yes	-
Sodium Diethyldithiocarbamate	-		1.0000	0.0000	172.2700	1.0000	Yes	0.0006
Sodium Fluoride	0.0130	C	1.0000	0.0010	41.9880	1.0000	Yes	-
Sodium Fluoroacetate	-		1.0000	0.0000	100.0300	1.0000	No	-
Sodium Metavanadate	-		1.0000	0.0010	121.9300	1.0000	Yes	-
Sodium Perchlorate	-		1.0000	0.0010	122.4400	1.0000	Yes	-
Sodium Tungstate	-		1.0000	0.0010	293.8200	1.0000	Yes	-
Sodium Tungstate Dihydrate	-		1.0000	0.0010	329.8500	1.0000	Yes	-
Sodium acid pyrophosphate	-		1.0000	0.0010	221.9400	1.0000	Yes	-
Sodium aluminum phosphate (acidic)	-		1.0000	0.0010	144.9427	1.0000	Yes	-
Sodium aluminum phosphate (anhydrous)	-		1.0000	0.0010	-	0.0000	Yes	-
Sodium aluminum phosphate (tetrahydrate)	-		1.0000	0.0010	949.8800	0.8000	Yes	-

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Sodium hexametaphosphate	-		1.0000	0.0010	611.1700	0.9000	Yes	-
Sodium polyphosphate	-		1.0000	0.0010	359.9200	1.0000	Yes	-
Sodium trimetaphosphate	-		1.0000	0.0010	305.8900	1.0000	Yes	-
Sodium tripolyphosphate	-		1.0000	0.0010	367.8600	1.0000	Yes	-
Stirofos (Tetrachlorovinphos)	-		1.0000	0.0031	365.9700	0.9000	Yes	0.0065
Strontium, Stable	-		1.0000	0.0010	87.6200	1.0000	Yes	-
Strychnine	-		1.0000	0.0004	334.4200	1.0000	Yes	-
Styrene	1.0000	I	1.0000	0.0372	104.1500	1.0000	Yes	-
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	-		1.0000	0.0119	210.0000	1.0000	Yes	-
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	-		1.0000	0.0119	210.0000	1.0000	Yes	-
Sulfolane	0.0020	X	1.0000	0.0001	120.1700	1.0000	Yes	-
Sulfonylbis(4-chlorobenzene), 1,1'-	-		1.0000	0.0149	287.1700	0.9000	Yes	-
Sulfur Mustard	-		1.0000	0.0045	159.0800	1.0000	Yes	-
Sulfur Trioxide	0.0010	C	1.0000	0.0010	80.0620	1.0000	Yes	-
Sulfuric Acid	0.0010	C	1.0000	0.0010	98.0780	1.0000	Yes	-
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	-		1.0000	0.0328	334.8700	0.8000	Yes	0.0062
TCDD, 2,3,7,8-	0.0000	C	1.0000	0.8080	321.9800	0.5000	No	-
TCDF, 2,3,7,8-	0.0000	W	1.0000	0.6570	305.9800	0.6000	No	-
TCMTB	-		1.0000	0.0112	238.3500	0.9000	Yes	-
Tebuthiuron	-		1.0000	0.0013	228.3200	1.0000	Yes	-
Temephos	-		1.0000	0.0345	466.4700	0.7000	No	-
Terbacil	-		1.0000	0.0017	216.6700	1.0000	Yes	-
Terbufos	-		1.0000	0.0358	288.4300	0.9000	Yes	-
Terbutryn	-		1.0000	0.0212	241.3600	0.9000	Yes	-
Tert-Butyl Acetate	-		1.0000	0.0052	116.1600	1.0000	Yes	0.0311
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	-		1.0000	0.0929	485.8000	0.6000	No	-
Tetrachlorobenzene, 1,2,4,5-	-		1.0000	0.1170	215.8900	1.0000	Yes	-
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	0.0004	W	1.0000	0.9170	291.9900	0.6000	No	-
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	0.0001	W	1.0000	0.5840	291.9900	0.7000	No	-
Tetrachloroethane, 1,1,1,2-	-		1.0000	0.0159	167.8500	1.0000	Yes	0.0060
Tetrachloroethane, 1,1,2,2-	-		1.0000	0.0069	167.8500	1.0000	Yes	0.0008
Tetrachloroethylene	0.0400	I	1.0000	0.0334	165.8300	1.0000	Yes	0.0741
Tetrachlorophenol, 2,3,4,6-	-		1.0000	0.0710	231.8900	0.9000	Yes	-
Tetrachlorotoluene, p- alpha, alpha, alpha-	-		1.0000	0.0836	229.9200	0.9000	Yes	0.0000
Tetraethyl Dithiopyrophosphate	-		1.0000	0.0109	322.3200	0.9000	Yes	-
Tetraethyl Lead	-		1.0000	0.0137	323.4400	0.9000	Yes	-
Tetrafluoroethane, 1,1,1,2-	80.0000	I	1.0000	0.0055	102.0300	1.0000	Yes	-
Tetrahydrofuran	2.0000	I	1.0000	0.0013	72.1080	1.0000	Yes	-
Tetramethylcyclohexane	-		1.0000	-	140.2658	0.0000	No	-
Tetrapotassium phosphate	-		1.0000	0.0010	330.3500	1.0000	Yes	-
Tetrasodium pyrophosphate	-		1.0000	0.0010	265.9000	1.0000	Yes	-
Tetryl (Trinitrophenylmethylnitramine)	-		1.0000	0.0005	287.1500	1.0000	Yes	-
Thallic Oxide	-		1.0000	0.0010	456.7650	0.9000	Yes	-
Thallium (I) Nitrate	-		1.0000	0.0010	267.3800	1.0000	Yes	-
Thallium (Soluble Salts)	-		1.0000	0.0010	204.3800	1.0000	Yes	-
Thallium Acetate	-		1.0000	0.0000	263.4200	1.0000	Yes	-
Thallium Carbonate	-		1.0000	0.0000	468.7500	1.0000	Yes	-
Thallium Chloride	-		1.0000	0.0010	239.8200	1.0000	Yes	-
Thallium Selenite	-		1.0000	0.0010	283.3400	1.0000	Yes	-
Thallium Sulfate	-		1.0000	0.0010	504.8000	0.9000	Yes	-
Thifensulfuron-methyl	-		1.0000	0.0001	387.4000	1.0000	Yes	-
Thiobencarb	-		1.0000	0.0102	257.7800	0.9000	Yes	-
Thiocyanates	-		1.0000	0.0010	-	0.0000	Yes	-
Thiocyanic Acid	-		1.0000	0.0010	59.0900	1.0000	Yes	-
Thiodiglycol	-		1.0000	0.0001	122.1900	1.0000	Yes	-
Thiofanox	-		1.0000	0.0063	218.3200	1.0000	Yes	-
Thiophanate, Methyl	-		1.0000	0.0002	342.4000	1.0000	Yes	0.0134
Thiram	-		1.0000	0.0010	240.4300	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Tin	-		1.0000	0.0010	118.7100	1.0000	Yes	-
Titanium Tetrachloride	0.0001	A	1.0000	0.0010	189.6790	1.0000	Yes	-
Toluene	5.0000	I	1.0000	0.0311	92.1420	1.0000	Yes	-
Toluene-2,4-diisocyanate	0.0000	C	1.0000	0.5050	174.1600	1.0000	Yes	0.0040
Toluene-2,5-diamine	-		1.0000	0.0004	122.1700	1.0000	Yes	0.0009
Toluene-2,6-diisocyanate	0.0000	C	1.0000	0.0505	174.1600	1.0000	Yes	0.0040
Toluic Acid, p-	-		1.0000	0.0087	136.1500	1.0000	Yes	-
Toluidine, o- (Methylaniline, 2-)	-		1.0000	0.0030	107.1600	1.0000	Yes	0.0097
Toluidine, p-	-		1.0000	0.0033	107.1600	1.0000	Yes	0.0052
Total Petroleum Hydrocarbons (Aliphatic High)	-		1.0000	1.9600	170.3400	1.0000	No	-
Total Petroleum Hydrocarbons (Aliphatic Low)	0.6000	P	1.0000	0.2010	86.1800	1.0000	Yes	-
Total Petroleum Hydrocarbons (Aliphatic Medium)	0.1000	P	1.0000	1.7000	128.2600	1.0000	No	-
Total Petroleum Hydrocarbons (Aromatic High)	-		1.0000	0.3080	202.2600	1.0000	No	-
Total Petroleum Hydrocarbons (Aromatic Low)	0.0300	P	1.0000	0.0149	78.1150	1.0000	Yes	-
Total Petroleum Hydrocarbons (Aromatic Medium)	0.0030	P	1.0000	0.0692	135.1900	1.0000	Yes	-
Toxaphene	-		1.0000	0.0518	448.2600	0.8000	No	-
Toxaphene, Weathered	-		1.0000	0.0518	448.2600	0.8000	No	-
Tralomethrin	-		1.0000	0.0305	665.0200	0.5000	No	-
Tri-n-butyltin	-		1.0000	0.0193	291.0500	0.9000	Yes	-
Triacetin	-		1.0000	0.0001	218.2100	1.0000	Yes	-
Triadimefon	-		1.0000	0.0024	293.7600	1.0000	Yes	-
Triallate	-		1.0000	0.0349	304.6700	0.9000	Yes	0.0022
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	-		1.0000	0.0010	887.8958	0.8000	Yes	-
Triasulfuron	-		1.0000	0.0000	401.8300	1.0000	Yes	-
Tribenuron-methyl	-		1.0000	0.0005	395.4000	1.0000	Yes	-
Tribromobenzene, 1,2,4-	-		1.0000	0.0337	314.8000	0.9000	Yes	-
Tribromophenol, 2,4,6-	-		1.0000	0.0121	330.8000	0.9000	Yes	-
Tributyl Phosphate	-		1.0000	0.0228	266.3200	0.9000	Yes	0.0173
Tributyltin Compounds	-		1.0000	-	-	0.0000	No	-
Tributyltin Oxide	-		1.0000	0.0003	596.0800	1.0000	Yes	-
Tricalcium phosphate	-		1.0000	0.0010	310.1800	1.0000	Yes	-
Trichloro-1,2,2-trifluoroethane, 1,1,2-	5.0000	P	1.0000	0.0175	187.3800	1.0000	Yes	-
Trichloro-2'-hydroxydiphenylether	-		1.0000	0.0541	289.5500	0.9000	Yes	-
Trichloroacetic Acid	-		1.0000	0.0015	163.3900	1.0000	Yes	0.0022
Trichloroaniline HCl, 2,4,6-	-		1.0000	0.0000	232.9300	1.0000	Yes	0.0054
Trichloroaniline, 2,4,6-	-		1.0000	0.0270	196.4600	1.0000	Yes	0.0222
Trichlorobenzene, 1,2,3-	-		1.0000	0.0738	181.4500	1.0000	Yes	-
Trichlorobenzene, 1,2,4-	0.0020	P	1.0000	0.0705	181.4500	1.0000	Yes	0.0054
Trichloroethane, 1,1,1-	5.0000	I	1.0000	0.0126	133.4100	1.0000	Yes	-
Trichloroethane, 1,1,2-	0.0002	X	1.0000	0.0050	133.4100	1.0000	Yes	0.0027
Trichloroethylene	0.0020	I	1.0000	0.0116	131.3900	1.0000	Yes	0.0024
Trichlorofluoromethane	-		1.0000	0.0127	137.3700	1.0000	Yes	-
Trichlorophenol, 2,4,5-	-		1.0000	0.0362	197.4500	1.0000	Yes	-
Trichlorophenol, 2,4,6-	-		1.0000	0.0346	197.4500	1.0000	Yes	0.0142
Trichlorophenoxyacetic Acid, 2,4,5-	-		1.0000	0.0091	255.4900	0.9000	Yes	-
Trichlorophenoxypropionic acid, -2,4,5	-		1.0000	0.0161	269.5100	0.9000	Yes	-
Trichloropropane, 1,1,2-	-		1.0000	0.0096	147.4300	1.0000	Yes	-
Trichloropropane, 1,2,3-	0.0003	I	1.0000	0.0075	147.4300	1.0000	Yes	0.0000
Trichloropropene, 1,2,3-	0.0003	P	1.0000	0.0169	145.4200	1.0000	Yes	-
Tricresyl Phosphate (TCP)	-		1.0000	0.0334	368.3700	0.8000	Yes	-
Tridiphane	-		1.0000	0.0689	320.4300	0.8000	Yes	-
Triethylamine	0.0070	I	1.0000	0.0039	101.1900	1.0000	Yes	-
Triethylene Glycol	-		1.0000	0.0000	150.1800	1.0000	Yes	-
Trifluoroethane, 1,1,1-	20.0000	P	1.0000	0.0076	84.0410	1.0000	Yes	-
Trifluralin	-		1.0000	0.0728	335.2900	0.8000	Yes	0.0202
Trimagnesium phosphate	-		1.0000	0.0010	262.8600	1.0000	Yes	-
Trimethyl Phosphate	-		1.0000	0.0001	140.0800	1.0000	Yes	0.0078
Trimethylbenzene, 1,2,3-	0.0600	I	1.0000	0.0897	120.2000	1.0000	Yes	-
Trimethylbenzene, 1,2,4-	0.0600	I	1.0000	0.0857	120.2000	1.0000	Yes	-

Chemical	RfC (mg/m^3)	RfC Ref	RAGSe GIABS (unitless)	K_p (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event(ca)}$
Trimethylbenzene, 1,3,5-	0.0600	I	1.0000	0.0621	120.2000	1.0000	Yes	-
Trimethylpentene, 2,4,4-	-		1.0000	0.3880	112.2200	1.0000	Yes	-
Trinitrobenzene, 1,3,5-	-		1.0000	0.0006	213.1100	1.0000	Yes	-
Trinitrotoluene, 2,4,6-	-		1.0000	0.0010	227.1300	1.0000	Yes	0.0052
Triphenylphosphine Oxide	-		1.0000	0.0033	278.2900	1.0000	Yes	-
Tripotassium phosphate	-		1.0000	0.0010	212.2700	1.0000	Yes	-
Tris(1,3-Dichloro-2-propyl) Phosphate	-		1.0000	0.0016	430.9100	0.9000	Yes	-
Tris(1-chloro-2-propyl)phosphate	-		1.0000	0.0012	327.5700	1.0000	Yes	-
Tris(2,3-dibromopropyl)phosphate	-		1.0000	0.0001	697.6200	1.0000	No	-
Tris(2-chloroethyl)phosphate	-		1.0000	0.0004	285.4900	1.0000	Yes	0.0078
Tris(2-ethylhexyl)phosphate	-		1.0000	11.6000	434.6500	0.0000	No	-
Trisbutoxyethyl Phosphate	-		1.0000	0.0028	398.4800	0.9000	Yes	-
Trisodium phosphate	-		1.0000	0.0010	163.9400	1.0000	Yes	-
Tungsten	-		1.0000	0.0010	183.8500	1.0000	Yes	-
Uranium	0.0000	A	1.0000	0.0010	238.0300	1.0000	Yes	-
Urethane	-		1.0000	0.0004	89.0950	1.0000	Yes	0.0000
Vanadium Pentoxide	0.0000	P	0.0260	0.0010	181.8800	1.0000	Yes	-
Vanadium and Compounds	0.0001	A	0.0260	0.0010	50.9400	1.0000	Yes	-
Vernolate	-		1.0000	0.0403	203.3500	1.0000	Yes	-
Vinclozolin	-		1.0000	0.0045	286.1200	0.9000	Yes	-
Vinyl Acetate	0.2000	I	1.0000	0.0016	86.0910	1.0000	Yes	-
Vinyl Bromide	0.0030	I	1.0000	0.0044	106.9500	1.0000	Yes	-
Vinyl Chloride	0.1000	I	1.0000	0.0084	62.4990	1.0000	Yes	0.0000
Warfarin	-		1.0000	0.0018	308.3400	1.0000	Yes	-
Xylene, m-	0.1000	G	1.0000	0.0532	106.1700	1.0000	Yes	-
Xylene, o-	0.1000	G	1.0000	0.0471	106.1700	1.0000	Yes	-
Xylene, p-	0.1000	G	1.0000	0.0493	106.1700	1.0000	Yes	-
Xylenes	0.1000	I	1.0000	0.0500	106.1700	1.0000	Yes	-
Zinc Cyanide	-		1.0000	0.0006	117.4100	1.0000	Yes	-
Zinc Phosphide	-		1.0000	0.0006	258.1750	1.0000	Yes	-
Zinc and Compounds	-		1.0000	0.0006	65.3700	1.0000	Yes	-
Zineb	-		1.0000	0.0003	275.7300	1.0000	Yes	-
Zirconium	-		1.0000	0.0010	91.2200	1.0000	Yes	-

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Site-specific

Recreator Regional Screening Level

Key: I = IRIS; P = PPRTV; O = OPP; A = ATS ided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = whe Csat exceeded.

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Acenaphthene	0.2346	0.4052	-	-	-	6220.0000
Acephate	0.0047	0.0081	-	-	-	124.0000
Acetaldehyde	-	-	-	-	-	-
Acetochlor	0.0782	0.1351	-	-	-	2070.0000
Acetone	3.5189	6.0785	-	-	-	93300.0000
Acetone Cyanohydrin	-	-	-	-	-	-
Acetonitrile	-	-	-	-	-	-
Acetophenone	0.3910	0.6754	-	-	-	10400.0000
Acetylaminofluorene, 2-	-	-	2.0200	0.7370	0.5400	-
Acrolein	0.0020	0.0034	-	-	-	51.8000
Acrylamide	0.0078	0.0135	3.6900	175.0000	3.6100	207.0000
Acrylic Acid	1.9549	3.3769	-	-	-	51800.0000
Acrylonitrile	0.1564	0.2702	14.2000	103.0000	12.5000	4150.0000
Adiponitrile	-	-	-	-	-	-
Alachlor	0.0391	0.0675	137.0000	40.8000	31.4000	1040.0000
Aldicarb	0.0039	0.0068	-	-	-	104.0000
Aldicarb Sulfone	0.0039	0.0068	-	-	-	104.0000
Aldrin	-	-	0.4520	-	0.4520	3.1100
Allyl Alcohol	0.0195	0.0338	-	-	-	518.0000
Allyl Chloride	-	-	366.0000	263.0000	153.0000	-
Aluminum	3.9099	6.7539	-	-	-	104000.0000
Aluminum Phosphide	0.0016	0.0027	-	-	-	41.5000
Aluminum metaphosphate	190.0200	328.2386	-	-	-	5040000.0000
Ametryn	0.0352	0.0608	-	-	-	933.0000
Aminobiphenyl, 4-	-	-	0.3660	0.1400	0.1010	-
Aminophenol, m-	0.3128	0.5403	-	-	-	8300.0000
Aminophenol, o-	0.0156	0.0270	-	-	-	415.0000
Aminophenol, p-	0.0782	0.1351	-	-	-	2070.0000
Amitraz	0.0098	0.0169	-	-	-	259.0000
Ammonium Perchlorate	0.0027	0.0047	-	-	-	72.6000
Ammonium Sulfamate	0.7820	1.3508	-	-	-	20700.0000
Ammonium polyphosphate	190.0200	328.2386	-	-	-	5040000.0000
Amyl Alcohol, tert-	-	-	-	-	-	-
Aniline	0.0274	0.0473	1350.0000	5460.0000	1080.0000	726.0000
Anthracene	1.1730	2.0262	-	-	-	31100.0000
Anthraquinone, 9,10-	0.0078	0.0135	192.0000	46.9000	37.7000	207.0000
Antimony (metallic)	0.0002	0.0004	-	-	-	41.5000
Antimony Pentoxide	0.0003	0.0005	-	-	-	51.8000
Antimony Potassium Tartrate	-	-	-	-	-	-
Antimony Tetroxide	0.0002	0.0004	-	-	-	41.5000
Antimony Trichloride	-	-	-	-	-	-
Antimony Trioxide	-	-	-	-	-	-
Aroclor 1016	-	-	110.0000	-	110.0000	7.2600
Aroclor 1221	-	-	3.8500	0.1080	0.1050	-
Aroclor 1232	-	-	3.8500	0.1080	0.1050	-
Aroclor 1242	-	-	3.8500	-	3.8500	-
Aroclor 1248	-	-	3.8500	-	3.8500	-
Aroclor 1254	-	-	3.8500	-	3.8500	2.0700
Aroclor 1260	-	-	3.8500	-	3.8500	-
Aroclor 5460	-	-	-	-	-	62.2000
Arsenic, Inorganic	0.0012	0.0020	5.1300	51.9000	4.6700	31.1000
Arsine	0.0000	0.0000	-	-	-	0.3630
Asulam	0.1408	0.2431	-	-	-	3730.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Atrazine	0.1368	0.2364	33.4000	25.4000	14.4000	3630.0000
Auramine	-	-	8.7400	5.8100	3.4900	-
Avermectin B1	-	-	-	-	-	41.5000
Azinphos-methyl	0.0117	0.0203	-	-	-	311.0000
Azobenzene	-	-	69.9000	6.7100	6.1200	-
Azodicarbonamide	3.9099	6.7539	-	-	-	104000.0000
Barium	0.0547	0.0946	-	-	-	20700.0000
Benfluralin	0.0195	0.0338	-	-	-	518.0000
Benomyl	0.1955	0.3377	-	-	-	5180.0000
Bensulfuron-methyl	0.7820	1.3508	-	-	-	20700.0000
Bentazon	0.1173	0.2026	-	-	-	3110.0000
Benz[a]anthracene	-	-	18.4000	-	18.4000	-
Benzaldehyde	0.3910	0.6754	1920.0000	3620.0000	1260.0000	10400.0000
Benzene	0.0156	0.0270	140.0000	75.7000	49.1000	415.0000
Benzenediamine-2-methyl sulfate, 1,4-	-	-	76.9000	-	76.9000	31.1000
Benzenethiol	0.0039	0.0068	-	-	-	104.0000
Benzidine	0.0117	0.0203	0.0080	0.0459	0.0068	311.0000
Benzo(j)fluoranthene	-	-	6.4100	-	6.4100	-
Benzo[a]pyrene	-	-	1.8400	-	1.8400	31.1000
Benzo[b]fluoranthene	-	-	18.4000	-	18.4000	-
Benzo[k]fluoranthene	-	-	184.0000	-	184.0000	-
Benzoic Acid	15.6395	27.0155	-	-	-	415000.0000
Benzotrichloride	-	-	0.5920	0.0550	0.0503	-
Benzyl Alcohol	0.3910	0.6754	-	-	-	10400.0000
Benzyl Chloride	0.0078	0.0135	45.2000	29.3000	17.8000	207.0000
Beryllium and compounds	0.0001	0.0001	-	-	-	207.0000
Bifenox	0.0352	0.0608	-	-	-	933.0000
Biphenthrin	0.0586	0.1013	-	-	-	1560.0000
Biphenyl, 1,1'-	1.9549	3.3769	961.0000	58.3000	55.0000	51800.0000
Bis(2-chloro-1-methylethyl) ether	0.1564	0.2702	-	-	-	4150.0000
Bis(2-chloroethoxy)methane	0.0117	0.0203	-	-	-	311.0000
Bis(2-chloroethyl)ether	-	-	6.9900	23.9000	5.4100	-
Bis(2-ethylhexyl)phthalate	-	-	549.0000	-	549.0000	2070.0000
Bis(chloromethyl)ether	-	-	0.0350	0.2830	0.0311	-
Bisphenol A	0.1955	0.3377	-	-	-	5180.0000
Boron And Borates Only	0.7820	1.3508	-	-	-	20700.0000
Boron Trichloride	7.8198	13.5078	-	-	-	207000.0000
Boron Trifluoride	0.1564	0.2702	-	-	-	4150.0000
Bromate	0.0156	0.0270	11.0000	111.0000	10.0000	415.0000
Bromo-2-chloroethane, 1-	-	-	3.8500	5.0500	2.1800	-
Bromo-3-fluorobenzene, 1-	0.0012	0.0020	-	-	-	31.1000
Bromo-4-fluorobenzene, 1-	0.0012	0.0020	-	-	-	31.1000
Bromobenzene	0.0313	0.0540	-	-	-	830.0000
Bromochloromethane	-	-	-	-	-	-
Bromodichloromethane	0.0782	0.1351	124.0000	171.0000	72.0000	2070.0000
Bromoform	0.0782	0.1351	974.0000	1300.0000	556.0000	2070.0000
Bromomethane	0.0055	0.0095	-	-	-	145.0000
Bromophos	0.0195	0.0338	-	-	-	518.0000
Bromopropane, 1-	-	-	-	-	-	-
Bromoxynil	0.0586	0.1013	74.7000	28.4000	20.6000	1560.0000
Bromoxynil Octanoate	0.0586	0.1013	74.7000	3.3400	3.2000	1560.0000
Butadiene, 1,3-	-	-	12.8000	6.7200	4.4100	-
Butanoic acid, 4-(2,4-dichlorophenoxy)-	0.1173	0.2026	-	-	-	3110.0000
Butanol, N-	0.3910	0.6754	-	-	-	10400.0000
Butyl Benzyl Phthalate	0.7820	1.3508	4050.0000	249.0000	235.0000	20700.0000
Butyl Formate, tert-	-	-	-	-	-	-
Butyl alcohol, sec-	7.8198	13.5078	-	-	-	207000.0000
Butylate	0.1955	0.3377	-	-	-	5180.0000
Butylated hydroxyanisole	-	-	38500.0000	2310.0000	2180.0000	-
Butylated hydroxytoluene	1.1730	2.0262	2140.0000	37.0000	36.3000	31100.0000
Butylbenzene, n-	-	-	-	-	-	5180.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Butylbenzene, sec-	-	-	-	-	-	10400.0000
Butylbenzene, tert-	0.3910	0.6754	-	-	-	10400.0000
Butylphthalyl Butylglycolate	3.9099	6.7539	-	-	-	104000.0000
Cacodylic Acid	0.0782	0.1351	-	-	-	2070.0000
Cadmium (Water)	0.0001	0.0002	-	-	-	51.8000
Calcium Cyanide	0.0039	0.0068	-	-	-	104.0000
Calcium pyrophosphate	190.0200	328.2386	-	-	-	5040000.0000
Caprolactam	1.9549	3.3769	-	-	-	51800.0000
Captafol	0.0078	0.0135	51.3000	16.6000	12.5000	207.0000
Captan	0.5083	0.8780	3340.0000	3290.0000	1660.0000	13500.0000
Carbaryl	0.3910	0.6754	-	-	-	10400.0000
Carbofuran	0.0195	0.0338	-	-	-	518.0000
Carbon Disulfide	0.3910	0.6754	-	-	-	10400.0000
Carbon Tetrachloride	0.0156	0.0270	110.0000	39.0000	28.8000	415.0000
Carbonyl Sulfide	-	-	-	-	-	-
Carbosulfan	0.0391	0.0675	-	-	-	1040.0000
Carboxin	0.3910	0.6754	-	-	-	10400.0000
Ceric oxide	-	-	-	-	-	-
Chloral	-	-	-	-	-	-
Chloral Hydrate	0.3910	0.6754	-	-	-	10400.0000
Chloramben	0.0586	0.1013	-	-	-	1560.0000
Chloranil	-	-	19.1000	32.2000	12.0000	-
Chlordane (technical mixture)	0.0020	0.0034	22.0000	0.3340	0.3290	51.8000
Chlordecone (Kepone)	0.0012	0.0020	0.7690	0.0596	0.0553	31.1000
Chlorfenvinphos	0.0027	0.0047	-	-	-	72.6000
Chlorimuron, Ethyl-	0.3519	0.6078	-	-	-	9330.0000
Chlorine	0.3910	0.6754	-	-	-	10400.0000
Chlorine Dioxide	0.1173	0.2026	-	-	-	3110.0000
Chlorite (Sodium Salt)	0.1173	0.2026	-	-	-	3110.0000
Chloro-1,1-difluoroethane, 1-	-	-	-	-	-	-
Chloro-1,3-butadiene, 2-	0.0782	0.1351	-	-	-	2070.0000
Chloro-2-methylaniline HCl, 4-	-	-	16.7000	4710.0000	16.7000	-
Chloro-2-methylaniline, 4-	0.0117	0.0203	76.9000	58.7000	33.3000	311.0000
Chloroacetaldehyde, 2-	-	-	28.5000	344.0000	26.3000	-
Chloroacetophenone, 2-	-	-	-	-	-	-
Chloroaniline, p-	0.0156	0.0270	38.5000	51.1000	21.9000	415.0000
Chlorobenzene	0.0782	0.1351	-	-	-	2070.0000
Chlorobenzene sulfonic acid, p-	0.3910	0.6754	-	-	-	10400.0000
Chlorobenzilate	0.0782	0.1351	69.9000	5.1800	4.8200	2070.0000
Chlorobenzoic Acid, p-	0.1173	0.2026	-	-	-	3110.0000
Chlorobenzotrifluoride, 3-nitro-4-	-	-	-	-	-	-
Chlorobenzotrifluoride, 4-	0.0117	0.0203	-	-	-	311.0000
Chlorobutane, 1-	0.1564	0.2702	-	-	-	4150.0000
Chlorodifluoromethane	-	-	-	-	-	-
Chloroethanol, 2-	0.0782	0.1351	-	-	-	2070.0000
Chloroform	0.0391	0.0675	248.0000	249.0000	124.0000	1040.0000
Chloromethane	-	-	-	-	-	-
Chloromethyl Methyl Ether	-	-	3.2000	27.7000	2.8700	-
Chloronaphthalene, Beta-	0.3128	0.5403	-	-	-	8300.0000
Chloronitrobenzene, o-	0.0117	0.0203	25.6000	22.9000	12.1000	311.0000
Chloronitrobenzene, p-	0.0027	0.0047	128.0000	91.1000	53.3000	72.6000
Chlorophenol, 2-	0.0195	0.0338	-	-	-	518.0000
Chloropicrin	-	-	-	-	-	-
Chlorothalonil	0.0586	0.1013	452.0000	269.0000	169.0000	1560.0000
Chlorotoluene, o-	0.0782	0.1351	-	-	-	2070.0000
Chlorotoluene, p-	0.0782	0.1351	-	-	-	2070.0000
Chlorozotocin	-	-	0.0320	9.3100	0.0319	-
Chlorpropham	0.1955	0.3377	-	-	-	5180.0000
Chlorpyrifos	0.0039	0.0068	-	-	-	104.0000
Chlorpyrifos Methyl	0.0391	0.0675	-	-	-	1040.0000
Chlorsulfuron	0.1955	0.3377	-	-	-	5180.0000

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Chlorthal-dimethyl	0.0391	0.0675	-	-	-	1040.0000
Chlorthiophos	0.0031	0.0054	-	-	-	83.0000
Chromium(III), Insoluble Salts	0.0762	0.1317	-	-	-	156000.0000
Chromium(VI)	0.0003	0.0005	3.6900	0.6200	0.5310	311.0000
Chrysene	-	-	1840.0000	-	1840.0000	-
Clofentezine	0.0508	0.0878	-	-	-	1350.0000
Cobalt	0.0012	0.0020	-	-	-	31.1000
Copper	0.1564	0.2702	-	-	-	4150.0000
Copper Cyanide	0.0195	0.0338	-	-	-	518.0000
Cresol, m-	0.1955	0.3377	-	-	-	5180.0000
Cresol, o-	0.1955	0.3377	-	-	-	5180.0000
Cresol, p-	0.3910	0.6754	-	-	-	10400.0000
Cresol, p-chloro-m-	0.3910	0.6754	-	-	-	10400.0000
Cresols	0.3910	0.6754	-	-	-	10400.0000
Crotonaldehyde, trans-	0.0039	0.0068	4.0500	20.5000	3.3800	104.0000
Cumene	0.3910	0.6754	-	-	-	10400.0000
Cupferron	-	-	35.0000	119000.0000	34.9000	-
Cyanazine	0.0078	0.0135	9.1600	14.8000	5.6600	207.0000
Cyanide (CN-)	0.0023	0.0041	-	-	-	62.2000
Cyanogen	0.0039	0.0068	-	-	-	104.0000
Cyanogen Bromide	0.3519	0.6078	-	-	-	9330.0000
Cyanogen Chloride	0.1955	0.3377	-	-	-	5180.0000
Cyclohexane	-	-	-	-	-	-
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	0.0782	0.1351	385.0000	88.2000	71.8000	2070.0000
Cyclohexanone	19.5494	33.7694	-	-	-	518000.0000
Cyclohexene	0.0195	0.0338	-	-	-	518.0000
Cyclohexylamine	0.7820	1.3508	-	-	-	20700.0000
Cyclopentadiene	-	-	-	-	-	-
Cyfluthrin	0.0977	0.1688	-	-	-	2590.0000
Cyhalothrin	-	-	-	-	-	104.0000
Cyromazine	1.9549	3.3769	-	-	-	51800.0000
DDD, p,p`- (DDD)	0.0001	0.0002	32.0000	0.3240	0.3210	3.1100
DDE, p,p'-	-	-	22.6000	-	22.6000	31.1000
DDT	-	-	22.6000	-	22.6000	51.8000
Dalapon	0.1173	0.2026	-	-	-	3110.0000
Daminozide	0.5865	1.0131	427.0000	119000.0000	426.0000	15600.0000
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	-	-	11000.0000	-	11000.0000	726.0000
Decane	-	-	-	-	-	-
Demeton	0.0002	0.0003	-	-	-	4.1500
Di(2-ethylhexyl)adipate	2.3459	4.0523	6410.0000	-	6410.0000	62200.0000
Diallate	-	-	126.0000	8.5200	7.9800	-
Diammonium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Diazinon	0.0027	0.0047	-	-	-	72.6000
Dibenz[a,h]anthracene	-	-	1.8400	-	1.8400	-
Dibenzo(a,e)pyrene	-	-	0.6410	-	0.6410	-
Dibenzofuran	0.0039	0.0068	-	-	-	104.0000
Dibenzothiophene	0.0391	0.0675	-	-	-	1040.0000
Dibromo-3-chloropropane, 1,2-	0.0008	0.0014	2.3100	1.5600	0.9290	20.7000
Dibromobenzene, 1,3-	0.0016	0.0027	-	-	-	41.5000
Dibromobenzene, 1,4-	0.0391	0.0675	-	-	-	1040.0000
Dibromochloromethane	0.0782	0.1351	91.6000	132.0000	54.1000	2070.0000
Dibromoethane, 1,2-	0.0352	0.0608	3.8500	6.5800	2.4300	933.0000
Dibromomethane (Methylene Bromide)	-	-	-	-	-	-
Dibutyl Phthalate	0.3910	0.6754	-	-	-	10400.0000
Dibutyltin Compounds	-	-	-	-	-	31.1000
Dibutyltin dichloride	-	-	-	-	-	-
Dicalcium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Dicamba	0.1173	0.2026	-	-	-	3110.0000
Dichloro-2-butene, 1,4-	-	-	-	-	-	-

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Dichloro-2-butene, cis-1,4-	-	-	-	-	-	-
Dichloro-2-butene, trans-1,4-	-	-	-	-	-	-
Dichloroacetic Acid	0.0156	0.0270	154.0000	829.0000	130.0000	415.0000
Dichlorobenzene, 1,2-	0.3519	0.6078	-	-	-	9330.0000
Dichlorobenzene, 1,3-	-	-	-	-	-	-
Dichlorobenzene, 1,4-	0.2737	0.4728	1420.0000	191.0000	168.0000	7260.0000
Dichlorobenzidine, 3,3'-	-	-	17.1000	4.1700	3.3500	-
Dichlorobenzophenone, 4,4'-	0.0352	0.0608	-	-	-	933.0000
Dichlorobenzotrifluoride, 3,4-	-	-	-	-	-	-
Dichlorodifluoromethane	0.7820	1.3508	-	-	-	20700.0000
Dichlorodiisopropyl ether, 2,2'-	-	-	-	-	-	-
Dichloroethane, 1,1-	0.7820	1.3508	1350.0000	1490.0000	707.0000	20700.0000
Dichloroethane, 1,2-	0.0235	0.0405	84.5000	149.0000	53.9000	622.0000
Dichloroethylene, 1,1-	0.1955	0.3377	-	-	-	5180.0000
Dichloroethylene, 1,2-cis-	0.0078	0.0135	-	-	-	207.0000
Dichloroethylene, 1,2-trans-	0.0782	0.1351	-	-	-	2070.0000
Dichlorophenol, 2,4-	0.0117	0.0203	-	-	-	311.0000
Dichlorophenoxy Acetic Acid, 2,4-	0.0391	0.0675	-	-	-	1040.0000
Dichloropropane, 1,2-	0.1564	0.2702	208.0000	195.0000	101.0000	4150.0000
Dichloropropane, 1,3-	0.0782	0.1351	-	-	-	2070.0000
Dichloropropanol, 2,3-	0.0117	0.0203	-	-	-	311.0000
Dichloropropene, 1,3-	0.1173	0.2026	76.9000	65.6000	35.4000	3110.0000
Dichlorvos	0.0020	0.0034	26.5000	127.0000	21.9000	51.8000
Dicrotophos	0.0001	0.0002	-	-	-	3.1100
Dicyclopentadiene	0.3128	0.5403	-	-	-	8300.0000
Dieldrin	0.0002	0.0003	0.4810	0.0253	0.0240	5.1800
Diethanolamine	0.0078	0.0135	-	-	-	207.0000
Diethyl Phthalate	3.1279	5.4031	-	-	-	83000.0000
Diethyl-meta-Toluamide, N,N (DEET)	-	-	-	-	-	-
Diethylene Glycol Monobutyl Ether	0.1173	0.2026	-	-	-	3110.0000
Diethylene Glycol Monoethyl Ether	0.2346	0.4052	-	-	-	6220.0000
Diethylformamide	0.0039	0.0068	-	-	-	104.0000
Diethylstilbestrol	-	-	0.0220	0.0006	0.0006	-
Difenzoquat	0.3245	0.5606	-	-	-	8610.0000
Diflubenzuron	0.0782	0.1351	-	-	-	2070.0000
Difluoroethane, 1,1-	-	-	-	-	-	-
Difluoropropane, 2,2-	-	-	-	-	-	-
Dihydrosafrole	-	-	175.0000	21.4000	19.1000	-
Diisopropyl Ether	-	-	-	-	-	-
Diisopropyl Methylphosphonate	0.3128	0.5403	-	-	-	8300.0000
Dimagnesium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Dimethipin	0.0852	0.1472	-	-	-	2260.0000
Dimethoate	0.0086	0.0149	-	-	-	228.0000
Dimethoxybenzidine, 3,3'-	-	-	4.8100	15.0000	3.6400	-
Dimethyl methylphosphonate	0.2346	0.4052	4520.0000	243000.0000	4440.0000	6220.0000
Dimethylamino azobenzene [p-]	-	-	1.6700	0.0663	0.0637	-
Dimethylaniline HCl, 2,4-	-	-	13.3000	4420.0000	13.2000	-
Dimethylaniline, 2,4-	0.0078	0.0135	38.5000	60.9000	23.6000	207.0000
Dimethylaniline, N,N-	0.0078	0.0135	285.0000	174.0000	108.0000	207.0000
Dimethylbenz(a)anthracene, 7,12-	-	-	0.0074	-	0.0074	-
Dimethylbenzidine, 3,3'-	-	-	0.6990	0.7850	0.3700	-
Dimethylformamide	0.3910	0.6754	-	-	-	10400.0000
Dimethylhydrazine, 1,1-	0.0004	0.0007	-	-	-	10.4000
Dimethylhydrazine, 1,2-	-	-	0.0140	0.3640	0.0135	-
Dimethylphenol, 2,4-	0.0782	0.1351	-	-	-	2070.0000
Dimethylphenol, 2,6-	0.0023	0.0041	-	-	-	62.2000
Dimethylphenol, 3,4-	0.0039	0.0068	-	-	-	104.0000
Dimethylphthalate	-	-	-	-	-	-
Dimethylterephthalate	0.3910	0.6754	-	-	-	10400.0000
Dimethylvinylchloride	-	-	171.0000	53.2000	40.6000	-
Dinitro-o-cresol, 4,6-	0.0003	0.0005	-	-	-	8.3000

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Dinitro-o-cyclohexyl Phenol, 4,6-	0.0078	0.0135	-	-	-	207.0000
Dinitrobenzene, 1,2-	0.0004	0.0007	-	-	-	10.4000
Dinitrobenzene, 1,3-	0.0004	0.0007	-	-	-	10.4000
Dinitrobenzene, 1,4-	0.0004	0.0007	-	-	-	10.4000
Dinitrophenol, 2,4-	0.0078	0.0135	-	-	-	207.0000
Dinitrotoluene Mixture, 2,4/2,6-	-	-	11.3000	13.4000	6.1400	-
Dinitrotoluene, 2,4-	0.0078	0.0135	24.8000	39.8000	15.3000	207.0000
Dinitrotoluene, 2,6-	0.0012	0.0020	5.1300	6.8400	2.9300	31.1000
Dinitrotoluene, 2-Amino-4,6-	0.0004	0.0007	-	-	-	10.4000
Dinitrotoluene, 4-Amino-2,6-	0.0004	0.0007	-	-	-	10.4000
Dinitrotoluene, Technical grade	0.0035	0.0061	17.1000	2.4200	2.1200	93.3000
Dinoseb	0.0039	0.0068	-	-	-	104.0000
Dioxane, 1,4-	0.1173	0.2026	76.9000	1770.0000	73.7000	3110.0000
Diphenamid	0.1173	0.2026	-	-	-	3110.0000
Diphenyl Ether	-	-	-	-	-	-
Diphenyl Sulfone	0.0031	0.0054	-	-	-	83.0000
Diphenylamine	0.3910	0.6754	-	-	-	10400.0000
Diphenylhydrazine, 1,2-	-	-	9.6100	3.6000	2.6200	-
Dipotassium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Diquat	-	-	-	-	-	228.0000
Direct Black 38	-	-	1.0400	-	1.0400	-
Direct Blue 6	-	-	1.0400	-	1.0400	-
Direct Brown 95	-	-	1.1500	-	1.1500	-
Disodium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Disulfoton	0.0002	0.0003	-	-	-	4.1500
Dithiane, 1,4-	0.0391	0.0675	-	-	-	1040.0000
Diundecyl Phthalate	-	-	-	-	-	-
Diuron	0.0078	0.0135	-	-	-	207.0000
Dodine	0.0782	0.1351	-	-	-	2070.0000
EPTC	0.1955	0.3377	-	-	-	5180.0000
Endosulfan	0.0235	0.0405	-	-	-	622.0000
Endosulfan Sulfate	0.0235	0.0405	-	-	-	622.0000
Endothall	0.0782	0.1351	-	-	-	2070.0000
Endrin	0.0012	0.0020	-	-	-	31.1000
Epichlorohydrin	0.0235	0.0405	777.0000	6200.0000	690.0000	622.0000
Epoxybutane, 1,2-	-	-	-	-	-	-
Ethanol, 2-(2-methoxyethoxy)-	0.1564	0.2702	-	-	-	4150.0000
Ethephon	0.0195	0.0338	-	-	-	518.0000
Ethion	0.0020	0.0034	-	-	-	51.8000
Ethoxyethanol Acetate, 2-	0.3910	0.6754	-	-	-	10400.0000
Ethoxyethanol, 2-	0.3519	0.6078	-	-	-	9330.0000
Ethyl Acetate	3.5189	6.0785	-	-	-	93300.0000
Ethyl Acrylate	0.0195	0.0338	-	-	-	518.0000
Ethyl Chloride	-	-	-	-	-	-
Ethyl Ether	0.7820	1.3508	-	-	-	20700.0000
Ethyl Methacrylate	-	-	-	-	-	-
Ethyl-p-nitrophenyl Phosphonate	0.0000	0.0001	-	-	-	1.0400
Ethylbenzene	0.3910	0.6754	699.0000	108.0000	93.6000	10400.0000
Ethylene Cyanohydrin	0.2737	0.4728	-	-	-	7260.0000
Ethylene Diamine	-	-	-	-	-	9330.0000
Ethylene Glycol	7.8198	13.5078	-	-	-	207000.0000
Ethylene Glycol Monobutyl Ether	0.3910	0.6754	-	-	-	10400.0000
Ethylene Oxide	-	-	5.9500	121.0000	5.6700	-
Ethylene Thiourea	0.0003	0.0005	171.0000	8180.0000	167.0000	8.3000
Ethyleneimine	-	-	0.1180	1.7400	0.1110	-
Ethylphthalyl Ethyl Glycolate	11.7296	20.2616	-	-	-	311000.0000
Fenamiphos	0.0010	0.0017	-	-	-	25.9000
Fenpropathrin	0.0977	0.1688	-	-	-	2590.0000
Fenvalerate	-	-	-	-	-	2590.0000
Fluometuron	0.0508	0.0878	-	-	-	1350.0000
Fluoranthene	-	-	-	-	-	4150.0000

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Fluorene	0.1564	0.2702	-	-	-	4150.0000
Fluoride	0.1564	0.2702	-	-	-	4150.0000
Fluorine (Soluble Fluoride)	0.2346	0.4052	-	-	-	6220.0000
Fluorobenzene	-	-	-	-	-	-
Fluridone	0.3128	0.5403	-	-	-	8300.0000
Flurprimidol	0.1564	0.2702	-	-	-	4150.0000
Flusilazole	0.0078	0.0135	-	-	-	207.0000
Flutolanil	1.9549	3.3769	-	-	-	51800.0000
Fluvalinate	-	-	-	-	-	1040.0000
Folpet	0.3519	0.6078	-	-	-	9330.0000
Fomesafen	0.0098	0.0169	-	-	-	259.0000
Fonofos	0.0078	0.0135	-	-	-	207.0000
Formaldehyde	0.7820	1.3508	366.0000	1770.0000	303.0000	20700.0000
Formic Acid	3.5189	6.0785	-	-	-	93300.0000
Fosetyl-AL	-	-	-	-	-	259000.0000
Furan	0.0039	0.0068	-	-	-	104.0000
Furazolidone	-	-	2.0200	94.3000	1.9800	-
Furfural	0.0117	0.0203	-	-	-	311.0000
Furium	-	-	5.1300	17.1000	3.9500	-
Furmecyclox	-	-	256.0000	18.0000	16.9000	-
Gadolinium	-	-	-	-	-	-
Glufosinate, Ammonium	-	-	-	-	-	622.0000
Glutaraldehyde	0.3910	0.6754	-	-	-	10400.0000
Glycidyl	0.0016	0.0027	-	-	-	41.5000
Glyphosate	-	-	-	-	-	10400.0000
Guanidine	0.0391	0.0675	-	-	-	1040.0000
Guanidine Chloride	-	-	-	-	-	2070.0000
Guanidine Nitrate	-	-	-	-	-	3110.0000
Haloxyfop, Methyl	0.0002	0.0003	-	-	-	5.1800
Heptachlor	0.0020	0.0034	1.7100	0.0215	0.0212	51.8000
Heptachlor Epoxide	0.0001	0.0001	0.8450	0.0656	0.0609	1.3500
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	-	-	1.9700	-	1.9700	2.4200
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	-	-	0.0059	-	0.0059	0.0073
Heptanal, n-	-	-	-	-	-	-
Heptane, N-	-	-	-	-	-	31.1000
Hexabromobenzene	-	-	-	-	-	207.0000
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	-	-	-	-	-	20.7000
Hexachlorobenzene	-	-	4.8100	-	4.8100	83.0000
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	-	-	1.9700	-	1.9700	2.4200
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	-	-	1.9700	-	1.9700	2.4200
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	-	-	1.9700	-	1.9700	2.4200
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	-	-	0.0020	-	0.0020	0.0024
Hexachlorobutadiene	0.0039	0.0068	98.6000	4.0200	3.8600	104.0000
Hexachlorocyclohexane, Alpha-	0.0313	0.0540	1.2200	0.1610	0.1420	830.0000
Hexachlorocyclohexane, Beta-	-	-	4.2700	0.5640	0.4990	-
Hexachlorocyclohexane, Gamma- (Lindane)	0.0012	0.0020	6.9900	0.9240	0.8160	31.1000
Hexachlorocyclohexane, Technical	-	-	4.2700	0.5640	0.4990	-
Hexachlorocyclopentadiene	0.0235	0.0405	-	-	-	622.0000
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	-	-	0.0006	-	0.0006	0.0007
Hexachlorodibenzo-p-dioxin, Mixture	-	-	0.0012	-	0.0012	-
Hexachlorodibenzofuran, 1,2,3,4,7,8-	-	-	0.0006	-	0.0006	0.0007
Hexachloroethane	0.0027	0.0047	192.0000	16.1000	14.8000	72.6000
Hexachlorophene	-	-	-	-	-	31.1000
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.0156	0.0270	96.1000	1090.0000	88.4000	415.0000
Hexamethylene Diisocyanate, 1,6-	-	-	-	-	-	-
Hexamethylene diisocyanate biuret	-	-	-	-	-	-
Hexamethylene diisocyanate isocyanurate	-	-	-	-	-	-
Hexamethylphosphoramide	0.0016	0.0027	-	-	-	41.5000
Hexane, Commercial	-	-	-	-	-	-
Hexane, N-	-	-	-	-	-	-
Hexanedioic Acid	7.8198	13.5078	-	-	-	207000.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	0.2737	0.4728	810.0000	281.0000	209.0000	7260.0000
Hexanone, 2-	0.0195	0.0338	-	-	-	518.0000
Hexazinone	0.1290	0.2229	-	-	-	3420.0000
Hexythiazox	0.0977	0.1688	-	-	-	2590.0000
HpCDD, 1,2,3,4,6,7,8,-	-	-	0.0059	-	0.0059	0.0073
HpCDF, 1,2,3,4,7,8,9-	-	-	0.0059	-	0.0059	0.0073
HxCDD, 1,2,3,6,7,8-	-	-	0.0006	-	0.0006	0.0007
HxCDD, 1,2,3,7,8,9-	-	-	0.0006	-	0.0006	0.0007
HxCDF, 1,2,3,6,7,8-	-	-	0.0006	-	0.0006	0.0007
HxCDF, 1,2,3,7,8,9-	-	-	0.0006	-	0.0006	0.0007
HxCDF, 2,3,4,6,7,8-	-	-	0.0006	-	0.0006	0.0007
Hydramethylnon	0.0665	0.1148	-	-	-	1760.0000
Hydrazine	-	-	2.5600	595.0000	2.5500	-
Hydrazine Sulfate	-	-	2.5600	25.9000	2.3300	-
Hydrogen Chloride	-	-	-	-	-	-
Hydrogen Cyanide	0.0023	0.0041	-	-	-	62.2000
Hydrogen Fluoride	0.1564	0.2702	-	-	-	4150.0000
Hydrogen Sulfide	-	-	-	-	-	-
Hydroquinone	0.1564	0.2702	128.0000	973.0000	113.0000	4150.0000
Imazalil	0.0098	0.0169	126.0000	28.3000	23.1000	259.0000
Imazaquin	0.9775	1.6885	-	-	-	25900.0000
Imazethapyr	9.7747	16.8847	-	-	-	259000.0000
Indeno[1,2,3-cd]pyrene	-	-	18.4000	-	18.4000	-
Iodine	0.0391	0.0675	-	-	-	1040.0000
Iprodione	0.1564	0.2702	-	-	-	4150.0000
Iron	2.7369	4.7277	-	-	-	72600.0000
Isobutyl Alcohol	1.1730	2.0262	-	-	-	31100.0000
Isophorone	0.7820	1.3508	8100.0000	14300.0000	5170.0000	20700.0000
Isopropalin	0.0586	0.1013	-	-	-	1560.0000
Isopropanol	7.8198	13.5078	-	-	-	207000.0000
Isopropyl Methyl Phosphonic Acid	0.3910	0.6754	-	-	-	10400.0000
Isoxaben	0.1955	0.3377	-	-	-	5180.0000
JP-4	-	-	-	-	-	-
JP-5	-	-	-	-	-	-
JP-7	-	-	-	-	-	-
JP-8	-	-	-	-	-	-
Kerosene	-	-	-	-	-	-
Lactofen	0.0313	0.0540	-	-	-	830.0000
Lactonitrile	0.0008	0.0014	-	-	-	20.7000
Lanthanum	0.0002	0.0003	-	-	-	5.1800
Lanthanum Acetate Hydrate	-	-	-	-	-	2.1600
Lanthanum Chloride Heptahydrate	0.0001	0.0001	-	-	-	1.9400
Lanthanum Chloride, Anhydrous	0.0001	0.0002	-	-	-	2.9300
Lanthanum Nitrate Hexahydrate	0.0001	0.0001	-	-	-	1.6600
Lead Phosphate	-	-	905.0000	9160.0000	823.0000	-
Lead acetate	-	-	36.6000	3410.0000	36.2000	-
Lead subacetate	-	-	202.0000	-	202.0000	-
Lewisite	0.0000	0.0000	-	-	-	0.5180
Linuron	0.0301	0.0520	-	-	-	798.0000
Lithium	0.0078	0.0135	-	-	-	207.0000
Lithium Perchlorate	0.0027	0.0047	-	-	-	72.6000
Lutetium	-	-	-	-	-	-
MCPA	0.0020	0.0034	-	-	-	51.8000
MCPB	0.0172	0.0297	-	-	-	456.0000
MCPP	0.0039	0.0068	-	-	-	104.0000
Malathion	0.0782	0.1351	-	-	-	2070.0000
Maleic Anhydride	0.3910	0.6754	-	-	-	10400.0000
Maleic Hydrazide	1.9549	3.3769	-	-	-	51800.0000
Malononitrile	0.0004	0.0007	-	-	-	10.4000
Mancozeb	0.1173	0.2026	-	-	-	3110.0000
Maneb	0.0195	0.0338	-	-	-	518.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Manganese (Non-diet)	0.0038	0.0065	-	-	-	2490.0000
Mephosfolan	0.0004	0.0006	-	-	-	9.3300
Mepiquat Chloride	-	-	-	-	-	3110.0000
Mercaptobenzothiazole, 2-	0.0156	0.0270	699.0000	519.0000	298.0000	415.0000
Mercuric Chloride	0.0001	0.0001	-	-	-	31.1000
Mercury (elemental)	-	-	-	-	-	-
Merphos	-	-	-	-	-	3.1100
Merphos Oxide	0.0004	0.0007	-	-	-	10.4000
Metalaxyl	0.2346	0.4052	-	-	-	6220.0000
Methacrylonitrile	0.0004	0.0007	-	-	-	10.4000
Methamidophos	0.0002	0.0003	-	-	-	5.1800
Methanol	7.8198	13.5078	-	-	-	207000.0000
Methidathion	0.0059	0.0101	-	-	-	156.0000
Methomyl	0.0977	0.1688	-	-	-	2590.0000
Methoxy-5-nitroaniline, 2-	-	-	157.0000	502.0000	120.0000	-
Methoxychlor	0.0195	0.0338	-	-	-	518.0000
Methoxyethanol Acetate, 2-	0.0313	0.0540	-	-	-	830.0000
Methoxyethanol, 2-	0.0195	0.0338	-	-	-	518.0000
Methyl Acetate	3.9099	6.7539	-	-	-	104000.0000
Methyl Acrylate	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	2.3459	4.0523	-	-	-	62200.0000
Methyl Hydrazine	0.0039	0.0068	-	-	-	104.0000
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	-	-	-	-	-	-
Methyl Isocyanate	-	-	-	-	-	-
Methyl Mercury	0.0004	0.0007	-	-	-	10.4000
Methyl Methacrylate	5.4738	9.4554	-	-	-	145000.0000
Methyl Parathion	0.0010	0.0017	-	-	-	25.9000
Methyl Phosphonic Acid	0.2346	0.4052	-	-	-	6220.0000
Methyl Styrene (Mixed Isomers)	0.0235	0.0405	-	-	-	622.0000
Methyl methanesulfonate	-	-	77.7000	3970.0000	76.2000	-
Methyl tert-Butyl Ether (MTBE)	-	-	4270.0000	15500.0000	3350.0000	-
Methyl-1,4-benzenediamine dihydrochloride, 2-	0.0012	0.0020	-	-	-	31.1000
Methyl-2-Pentanol, 4-	-	-	-	-	-	-
Methyl-5-Nitroaniline, 2-	0.0782	0.1351	855.0000	1290.0000	514.0000	2070.0000
Methyl-N-nitro-N-nitrosoguanidine, N-	-	-	0.9270	96.4000	0.9180	-
Methylaniline Hydrochloride, 2-	-	-	59.2000	34200.0000	59.1000	-
Methylarsonic acid	0.0391	0.0675	-	-	-	1040.0000
Methylbenzene,1-4-diamine monohydrochloride, 2-	-	-	-	-	-	20.7000
Methylbenzene-1,4-diamine sulfate, 2-	-	-	76.9000	-	76.9000	31.1000
Methylcholanthrene, 3-	-	-	0.0838	-	0.0838	-
Methylcyclopentane	-	-	-	-	-	-
Methylene Chloride	0.0235	0.0405	922.0000	2680.0000	686.0000	622.0000
Methylene-bis(2-chloroaniline), 4,4'-	0.0078	0.0135	18.4000	3.9400	3.2500	207.0000
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	-	-	167.0000	11.0000	10.3000	-
Methylenebisbenzenamine, 4,4'-	-	-	4.8100	15.5000	3.6700	-
Methylenediphenyl Diisocyanate	-	-	-	-	-	-
Methylnaphthalene, 1-	0.2737	0.4728	265.0000	17.9000	16.7000	7260.0000
Methylnaphthalene, 2-	0.0156	0.0270	-	-	-	415.0000
Methylstyrene, Alpha-	0.2737	0.4728	-	-	-	7260.0000
Metolachlor	0.5865	1.0131	-	-	-	15600.0000
Metribuzin	0.0977	0.1688	-	-	-	2590.0000
Metsulfuron-methyl	0.9775	1.6885	-	-	-	25900.0000
Mineral oils	-	-	-	-	-	311000.0000
Mirex	-	-	0.4270	-	0.4270	20.7000
Molinate	0.0078	0.0135	-	-	-	207.0000
Molybdenum	0.0195	0.0338	-	-	-	518.0000
Monoaluminum phosphate	190.0200	328.2386	-	-	-	5040000.0000
Monoammonium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Monobutyltin Compounds	-	-	-	-	-	-
Monocalcium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Monochloramine	0.3910	0.6754	-	-	-	10400.0000

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Monomagnesium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Monomethylaniline	0.0078	0.0135	-	-	-	207.0000
Monopotassium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Monosodium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Myclobutanil	0.0977	0.1688	-	-	-	2590.0000
N,N'-Diphenyl-1,4-benzenediamine	0.0012	0.0020	-	-	-	31.1000
Naled	0.0078	0.0135	-	-	-	207.0000
Naphtha, High Flash Aromatic (HFAN)	-	-	-	-	-	3110.0000
Naphthalene	0.0782	0.1351	64.1000	9.3500	8.1600	2070.0000
Naphthylamine, 2-	-	-	4.2700	3.2400	1.8400	-
Napropamide	0.4692	0.8105	-	-	-	12400.0000
Neodymium Chloride (Stable, Nonradioactive)	-	-	-	-	-	-
Nickel Acetate	0.0430	0.0743	8.4500	2230.0000	8.4200	1140.0000
Nickel Carbonate	0.0430	0.0743	8.4500	4360.0000	8.4400	1140.0000
Nickel Carbonyl	0.0430	0.0743	8.4500	-	8.4500	1140.0000
Nickel Hydroxide	0.0017	0.0030	8.4500	3.4200	2.4400	1140.0000
Nickel Oxide	0.0017	0.0030	8.4500	3.4200	2.4400	1140.0000
Nickel Refinery Dust	0.0017	0.0030	8.4500	17.1000	5.6600	1140.0000
Nickel Soluble Salts	0.0031	0.0054	-	-	-	2070.0000
Nickel Subsulfide	0.0017	0.0030	4.5200	9.1600	3.0300	1140.0000
Nickelocene	0.0430	0.0743	8.4500	-	8.4500	1140.0000
Nitrate (measured as nitrogen)	6.2558	10.8062	-	-	-	166000.0000
Nitrite (measured as nitrogen)	0.3910	0.6754	-	-	-	10400.0000
Nitroaniline, 2-	0.0391	0.0675	-	-	-	1040.0000
Nitroaniline, 3-	-	-	-	-	-	-
Nitroaniline, 4-	0.0156	0.0270	385.0000	1090.0000	284.0000	415.0000
Nitrobenzene	0.0078	0.0135	-	-	-	207.0000
Nitrocellulose	-	-	-	-	-	311000000.0000
Nitrofurantoin	0.2737	0.4728	-	-	-	7260.0000
Nitrofurazone	-	-	5.9200	153.0000	5.7000	-
Nitroglycerin	0.0004	0.0007	452.0000	1680.0000	356.0000	10.4000
Nitroguanidine	0.3910	0.6754	-	-	-	10400.0000
Nitromethane	-	-	-	-	-	-
Nitrophenol, 2-	-	-	-	-	-	-
Nitropropane, 2-	-	-	-	-	-	-
Nitropyrene, 4-	-	-	6.4100	0.2470	0.2380	-
Nitroso-N-ethylurea, N-	-	-	0.0683	1.2700	0.0648	-
Nitroso-N-methylurea, N-	-	-	0.0154	0.3750	0.0148	-
Nitroso-di-N-butylamine, N-	-	-	1.4200	0.7080	0.4730	-
Nitroso-di-N-propylamine, N-	-	-	1.1000	3.0600	0.8090	-
Nitrosodiethanolamine, N-	-	-	2.7500	446.0000	2.7300	-
Nitrosodiethylamine, N-	-	-	0.0123	0.1360	0.0113	-
Nitrosodimethylamine, N-	0.0000	0.0001	0.0362	1.5200	0.0353	0.8300
Nitrosodiphenylamine, N-	-	-	1570.0000	482.0000	369.0000	-
Nitrosomethylethylamine, N-	-	-	0.3500	5.0100	0.3270	-
Nitrosomorpholine [N-]	-	-	1.1500	44.4000	1.1200	-
Nitrosopiperidine [N-]	-	-	0.8180	9.1400	0.7510	-
Nitrosopyrrolidine, N-	-	-	3.6600	83.6000	3.5100	-
Nitrotoluene, m-	0.0004	0.0007	-	-	-	10.4000
Nitrotoluene, o-	0.0035	0.0061	35.0000	24.6000	14.4000	93.3000
Nitrotoluene, p-	0.0156	0.0270	481.0000	304.0000	186.0000	415.0000
Nonane, n-	-	-	-	-	-	31.1000
Norflurazon	0.0586	0.1013	-	-	-	1560.0000
OCDD	-	-	0.1970	-	0.1970	0.2420
OCDF	-	-	0.1970	-	0.1970	0.2420
Octabromodiphenyl Ether	-	-	-	-	-	311.0000
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.1955	0.3377	-	-	-	5180.0000
Octamethylpyrophosphoramide	0.0078	0.0135	-	-	-	207.0000
Octyl Phthalate, di-N-	-	-	-	-	-	1040.0000

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Oryzalin	0.5474	0.9455	987.0000	350.0000	258.0000	14500.0000
Oxadiazon	0.0195	0.0338	-	-	-	518.0000
Oxamyl	0.0977	0.1688	-	-	-	2590.0000
Oxyfluorfen	0.1173	0.2026	105.0000	9.9800	9.1200	3110.0000
Paclobutrazol	0.0508	0.0878	-	-	-	1350.0000
Paraquat Dichloride	-	-	-	-	-	467.0000
Parathion	0.0235	0.0405	-	-	-	622.0000
PeCDF, 1,2,3,7,8-	-	-	0.0020	-	0.0020	0.0024
PeCDF, 2,3,4,7,8-	-	-	0.0002	-	0.0002	0.0002
Pebulate	0.1955	0.3377	-	-	-	5180.0000
Pendimethalin	1.1730	2.0262	-	-	-	31100.0000
Pentabromodiphenyl Ether	-	-	-	-	-	207.0000
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	-	-	-	-	-	10.4000
Pentachlorobenzene	0.0031	0.0054	-	-	-	83.0000
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	-	-	1.9700	-	1.9700	2.4200
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	-	-	1.9700	-	1.9700	2.4200
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	-	-	1.9700	-	1.9700	2.4200
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	-	-	1.9700	-	1.9700	2.4200
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	-	-	0.0006	-	0.0006	0.0007
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	-	-	0.0001	-	0.0001	0.0001
Pentachloroethane	-	-	85.5000	23.4000	18.4000	-
Pentachloronitrobenzene	0.0117	0.0203	29.6000	1.8700	1.7600	311.0000
Pentachlorophenol	0.0195	0.0338	19.2000	0.4820	0.4710	518.0000
Pentaerythritol tetranitrate (PETN)	0.0078	0.0135	1920.0000	3960.0000	1290.0000	207.0000
Pentane, n-	-	-	-	-	-	-
Perchlorate and Perchlorate Salts	0.0027	0.0047	-	-	-	72.6000
Perfluorobutane sulfonic acid (PFBS)	0.0782	0.1351	-	-	-	2070.0000
Perfluorobutanesulfonate	0.0782	0.1351	-	-	-	2070.0000
Perfluorooctane sulfonic acid (PFOS)	-	-	-	-	-	2.0700
Perfluorooctanesulfonate	-	-	-	-	-	2.0700
Perfluorooctanoic acid (PFOA)	-	-	110.0000	-	110.0000	2.0700
Permethrin	-	-	-	-	-	5180.0000
Phenacetin	-	-	3500.0000	10200.0000	2600.0000	-
Phenmedipham	0.9384	1.6209	-	-	-	24900.0000
Phenol	1.1730	2.0262	-	-	-	31100.0000
Phenol, 2-(1-methylethoxy)-, methylcarbamate	0.0156	0.0270	-	-	-	415.0000
Phenothiazine	0.0020	0.0034	-	-	-	51.8000
Phenyl Isothiocyanate	0.0008	0.0014	-	-	-	20.7000
Phenylenediamine, m-	0.0235	0.0405	-	-	-	622.0000
Phenylenediamine, o-	0.0156	0.0270	64.1000	936.0000	60.0000	415.0000
Phenylenediamine, p-	0.0039	0.0068	-	-	-	104.0000
Phenylmercuric Acetate	0.0003	0.0005	-	-	-	8.3000
Phenylphenol, 2-	-	-	3960.0000	1080.0000	848.0000	-
Phorate	0.0008	0.0014	-	-	-	20.7000
Phosgene	-	-	-	-	-	-
Phosmet	0.0782	0.1351	-	-	-	2070.0000
Phosphine	0.0012	0.0020	-	-	-	31.1000
Phosphoric Acid	190.0200	328.2386	-	-	-	5040000.0000
Phosphorus, White	0.0001	0.0001	-	-	-	2.0700
Phthalic Acid, P-	3.9099	6.7539	-	-	-	104000.0000
Phthalic Anhydride	7.8198	13.5078	-	-	-	207000.0000
Picloram	0.2737	0.4728	-	-	-	7260.0000
Picramic Acid (2-Amino-4,6-dinitrophenol)	0.0004	0.0007	-	-	-	10.4000
Picric Acid (2,4,6-Trinitrophenol)	0.0035	0.0061	-	-	-	93.3000
Pirimiphos, Methyl	0.0003	0.0005	-	-	-	7.2600
Polybrominated Biphenyls	-	-	0.2560	-	0.2560	0.7260
Polychlorinated Biphenyls (low risk)	-	-	19.2000	-	19.2000	-
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	-	-	-	-	-	-
Polyphosphoric acid	190.0200	328.2386	-	-	-	5040000.0000
Potassium Cyanide	0.0078	0.0135	-	-	-	207.0000
Potassium Perchlorate	0.0027	0.0047	-	-	-	72.6000

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Potassium Perfluorobutane Sulfonate	0.0782	0.1351	-	-	-	2070.0000
Potassium Perfluorooctane Sulfonate	-	-	-	-	-	2.0700
Potassium Silver Cyanide	0.0008	0.0014	-	-	-	518.0000
Potassium tripolyphosphate	190.0200	328.2386	-	-	-	5040000.0000
Praseodymium Chloride (Stable, Nonradioactive)	-	-	-	-	-	-
Prochloraz	0.0352	0.0608	51.3000	12.5000	10.1000	933.0000
Profluralin	0.0235	0.0405	-	-	-	622.0000
Prometon	0.0586	0.1013	-	-	-	1560.0000
Prometryn	0.1564	0.2702	-	-	-	4150.0000
Pronamide	0.2932	0.5065	-	-	-	7780.0000
Propachlor	0.0508	0.0878	-	-	-	1350.0000
Propanil	0.0195	0.0338	-	-	-	518.0000
Propargite	0.1564	0.2702	40.1000	2.3400	2.2200	4150.0000
Propargyl Alcohol	0.0078	0.0135	-	-	-	207.0000
Propazine	0.0782	0.1351	-	-	-	2070.0000
Propham	0.0782	0.1351	-	-	-	2070.0000
Propiconazole	0.3910	0.6754	-	-	-	10400.0000
Propionaldehyde	-	-	-	-	-	-
Propyl benzene	0.3910	0.6754	-	-	-	10400.0000
Propylene	-	-	-	-	-	-
Propylene Glycol	78.1975	135.0776	-	-	-	2070000.0000
Propylene Glycol Dinitrate	-	-	-	-	-	-
Propylene Glycol Monomethyl Ether	2.7369	4.7277	-	-	-	72600.0000
Propylene Oxide	-	-	32.0000	343.0000	29.3000	-
Pyrene	0.1173	0.2026	-	-	-	3110.0000
Pyridine	0.0039	0.0068	-	-	-	104.0000
Quinalphos	0.0020	0.0034	-	-	-	51.8000
Quinoline	-	-	2.5600	2.5500	1.2800	-
Quizalofop-ethyl	0.0352	0.0608	-	-	-	933.0000
Resmethrin	0.1173	0.2026	-	-	-	3110.0000
Ronnel	0.1955	0.3377	-	-	-	5180.0000
Rotenone	0.0156	0.0270	-	-	-	415.0000
Rubidium	-	-	-	-	-	-
Rubidium Chloride	-	-	-	-	-	-
Rubidium Hydroxide	-	-	-	-	-	-
Rubidium Iodide	-	-	-	-	-	-
Safrole	-	-	8.3800	5.5400	3.3400	-
Samarium Chloride (Stable, Nonradioactive)	-	-	-	-	-	-
Samarium Nitrate (Stable, Nonradioactive)	-	-	-	-	-	-
Selenious Acid	0.0195	0.0338	-	-	-	518.0000
Selenium	0.0195	0.0338	-	-	-	518.0000
Selenium Sulfide	0.0195	0.0338	-	-	-	518.0000
Sethoxydim	0.5474	0.9455	-	-	-	14500.0000
Silica (crystalline, respirable)	-	-	-	-	-	-
Silver	0.0008	0.0014	-	-	-	518.0000
Silver Cyanide	0.0156	0.0270	-	-	-	10400.0000
Simazine	0.0195	0.0338	64.1000	85.8000	36.7000	518.0000
Sodium Acifluorfen	0.0508	0.0878	-	-	-	1350.0000
Sodium Azide	0.0156	0.0270	-	-	-	415.0000
Sodium Cyanide	0.0039	0.0068	-	-	-	104.0000
Sodium Diethyldithiocarbamate	0.1173	0.2026	28.5000	7800.0000	28.4000	3110.0000
Sodium Fluoride	0.1955	0.3377	-	-	-	5180.0000
Sodium Fluoroacetate	-	-	-	-	-	2.0700
Sodium Metavanadate	0.0039	0.0068	-	-	-	104.0000
Sodium Perchlorate	0.0027	0.0047	-	-	-	72.6000
Sodium Tungstate	0.0031	0.0054	-	-	-	83.0000
Sodium Tungstate Dihydrate	0.0031	0.0054	-	-	-	83.0000
Sodium acid pyrophosphate	190.0200	328.2386	-	-	-	5040000.0000
Sodium aluminum phosphate (acidic)	190.0200	328.2386	-	-	-	5040000.0000
Sodium aluminum phosphate (anhydrous)	190.0200	328.2386	-	-	-	5040000.0000
Sodium aluminum phosphate (tetrahydrate)	190.0200	328.2386	-	-	-	5040000.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Sodium hexametaphosphate	190.0200	328.2386	-	-	-	5040000.0000
Sodium polyphosphate	190.0200	328.2386	-	-	-	5040000.0000
Sodium trimetaphosphate	190.0200	328.2386	-	-	-	5040000.0000
Sodium tripolyphosphate	190.0200	328.2386	-	-	-	5040000.0000
Stirofos (Tetrachlorovinphos)	0.1173	0.2026	320.0000	175.0000	113.0000	3110.0000
Strontium, Stable	2.3459	4.0523	-	-	-	62200.0000
Strychnine	0.0012	0.0020	-	-	-	31.1000
Styrene	0.7820	1.3508	-	-	-	20700.0000
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	0.0117	0.0203	-	-	-	311.0000
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	0.0117	0.0203	-	-	-	311.0000
Sulfolane	0.0039	0.0068	-	-	-	104.0000
Sulfonylbis(4-chlorobenzene), 1,1'-	0.0031	0.0054	-	-	-	83.0000
Sulfur Mustard	-	-	-	-	-	-
Sulfur Trioxide	-	-	-	-	-	-
Sulfuric Acid	-	-	-	-	-	-
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	0.1955	0.3377	308.0000	21.6000	20.2000	5180.0000
TCDD, 2,3,7,8-	-	-	0.0001	-	0.0001	0.0001
TCDF, 2,3,7,8-	-	-	0.0006	-	0.0006	0.0007
TCMTB	0.1173	0.2026	-	-	-	3110.0000
Tebuthiuron	0.2737	0.4728	-	-	-	7260.0000
Temephos	-	-	-	-	-	2070.0000
Terbacil	0.0508	0.0878	-	-	-	1350.0000
Terbufos	0.0001	0.0002	-	-	-	2.5900
Terbutryn	0.0039	0.0068	-	-	-	104.0000
Tert-Butyl Acetate	-	-	1540.0000	2070.0000	882.0000	-
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	-	-	-	-	-	10.4000
Tetrachlorobenzene, 1,2,4,5-	0.0012	0.0020	-	-	-	31.1000
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	-	-	0.5920	-	0.5920	0.7260
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	-	-	0.1970	-	0.1970	0.2420
Tetrachloroethane, 1,1,1,2-	0.1173	0.2026	296.0000	101.0000	75.1000	3110.0000
Tetrachloroethane, 1,1,2,2-	0.0782	0.1351	38.5000	30.0000	16.8000	2070.0000
Tetrachloroethylene	0.0235	0.0405	3660.0000	601.0000	516.0000	622.0000
Tetrachlorophenol, 2,3,4,6-	0.1173	0.2026	-	-	-	3110.0000
Tetrachlorotoluene, p- alpha, alpha, alpha-	0.0002	0.0004	0.4810	0.0232	0.0221	6.2200
Tetraethyl Dithiopyrophosphate	0.0020	0.0034	-	-	-	51.8000
Tetraethyl Lead	0.0000	0.0000	-	-	-	0.0104
Tetrafluoroethane, 1,1,1,2-	-	-	-	-	-	-
Tetrahydrofuran	3.5189	6.0785	-	-	-	93300.0000
Tetramethylcyclohexane	-	-	-	-	-	-
Tetrapotassium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Tetrasodium pyrophosphate	190.0200	328.2386	-	-	-	5040000.0000
Tetryl (Trinitrophenylmethylnitramine)	0.0078	0.0135	-	-	-	207.0000
Thallic Oxide	0.0001	0.0001	-	-	-	2.0700
Thallium (I) Nitrate	0.0000	0.0001	-	-	-	1.0400
Thallium (Soluble Salts)	0.0000	0.0001	-	-	-	1.0400
Thallium Acetate	0.0000	0.0001	-	-	-	1.0400
Thallium Carbonate	0.0001	0.0001	-	-	-	2.0700
Thallium Chloride	0.0000	0.0001	-	-	-	1.0400
Thallium Selenite	0.0000	0.0001	-	-	-	1.0400
Thallium Sulfate	0.0001	0.0001	-	-	-	2.0700
Thifensulfuron-methyl	0.1681	0.2904	-	-	-	4460.0000
Thiobencarb	0.0391	0.0675	-	-	-	1040.0000
Thiocyanates	0.0008	0.0014	-	-	-	20.7000
Thiocyanic Acid	0.0008	0.0014	-	-	-	20.7000
Thiodiglycol	0.2737	0.4728	-	-	-	7260.0000
Thiofanox	0.0012	0.0020	-	-	-	31.1000
Thiophanate, Methyl	0.1056	0.1824	663.0000	7280.0000	608.0000	2800.0000
Thiram	0.0586	0.1013	-	-	-	1560.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Tin	2.3459	4.0523	-	-	-	62200.0000
Titanium Tetrachloride	-	-	-	-	-	-
Toluene	0.3128	0.5403	-	-	-	8300.0000
Toluene-2,4-diisocyanate	-	-	197.0000	2.0300	2.0100	-
Toluene-2,5-diamine	0.0008	0.0014	42.7000	700.0000	40.3000	20.7000
Toluene-2,6-diisocyanate	-	-	197.0000	20.3000	18.4000	-
Toluic Acid, p-	0.0195	0.0338	-	-	-	518.0000
Toluidine, o- (Methylaniline, 2-)	-	-	481.0000	1160.0000	340.0000	-
Toluidine, p-	0.0156	0.0270	256.0000	559.0000	176.0000	415.0000
Total Petroleum Hydrocarbons (Aliphatic High)	-	-	-	-	-	311000.0000
Total Petroleum Hydrocarbons (Aliphatic Low)	-	-	-	-	-	-
Total Petroleum Hydrocarbons (Aliphatic Medium)	-	-	-	-	-	1040.0000
Total Petroleum Hydrocarbons (Aromatic High)	-	-	-	-	-	4150.0000
Total Petroleum Hydrocarbons (Aromatic Low)	0.0156	0.0270	-	-	-	415.0000
Total Petroleum Hydrocarbons (Aromatic Medium)	0.0156	0.0270	-	-	-	415.0000
Toxaphene	-	-	6.9900	-	6.9900	9.3300
Toxaphene, Weathered	-	-	-	-	-	3.1100
Tralomethrin	-	-	-	-	-	778.0000
Tri-n-butyltin	0.0012	0.0020	-	-	-	31.1000
Triacetin	312.7901	540.3105	-	-	-	8300000.0000
Triadimefon	0.1329	0.2296	-	-	-	3530.0000
Triallate	0.0977	0.1688	107.0000	7.6500	7.1400	2590.0000
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	190.0200	328.2386	-	-	-	5040000.0000
Triasulfuron	0.0391	0.0675	-	-	-	1040.0000
Tribenuron-methyl	0.0313	0.0540	-	-	-	830.0000
Tribromobenzene, 1,2,4-	0.0195	0.0338	-	-	-	518.0000
Tribromophenol, 2,4,6-	0.0352	0.0608	-	-	-	933.0000
Tributyl Phosphate	0.0391	0.0675	855.0000	119.0000	105.0000	1040.0000
Tributyltin Compounds	-	-	-	-	-	31.1000
Tributyltin Oxide	0.0012	0.0020	-	-	-	31.1000
Tricalcium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Trichloro-1,2,2-trifluoroethane, 1,1,2-	117.2963	202.6164	-	-	-	3110000.0000
Trichloro-2'-hydroxydiphenylether	-	-	-	-	-	-
Trichloroacetic Acid	0.0782	0.1351	110.0000	422.0000	87.2000	2070.0000
Trichloroaniline HCl, 2,4,6-	-	-	265.0000	34200.0000	263.0000	-
Trichloroaniline, 2,4,6-	0.0001	0.0002	1100.0000	183.0000	157.0000	3.1100
Trichlorobenzene, 1,2,3-	0.0031	0.0054	-	-	-	83.0000
Trichlorobenzene, 1,2,4-	0.0391	0.0675	265.0000	18.6000	17.4000	1040.0000
Trichloroethane, 1,1,1-	7.8198	13.5078	-	-	-	207000.0000
Trichloroethane, 1,1,2-	0.0156	0.0270	135.0000	172.0000	75.5000	415.0000
Trichloroethylene	0.0020	0.0034	102.0000	65.3000	39.8000	51.8000
Trichlorofluoromethane	1.1730	2.0262	-	-	-	31100.0000
Trichlorophenol, 2,4,5-	0.3910	0.6754	-	-	-	10400.0000
Trichlorophenol, 2,4,6-	0.0039	0.0068	699.0000	90.4000	80.0000	104.0000
Trichlorophenoxyacetic Acid, 2,4,5-	0.0391	0.0675	-	-	-	1040.0000
Trichlorophenoxypropionic acid, -2,4,5	0.0313	0.0540	-	-	-	830.0000
Trichloropropane, 1,1,2-	0.0195	0.0338	-	-	-	518.0000
Trichloropropane, 1,2,3-	0.0156	0.0270	0.0615	0.0649	0.0316	415.0000
Trichloropropene, 1,2,3-	0.0117	0.0203	-	-	-	311.0000
Tricresyl Phosphate (TCP)	0.0782	0.1351	-	-	-	2070.0000
Tridiphane	0.0117	0.0203	-	-	-	311.0000
Triethylamine	-	-	-	-	-	-
Triethylene Glycol	7.8198	13.5078	-	-	-	207000.0000
Trifluoroethane, 1,1,1-	-	-	-	-	-	-
Trifluralin	0.0293	0.0507	999.0000	31.5000	30.6000	778.0000
Trimagnesium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Trimethyl Phosphate	0.0391	0.0675	385.0000	25000.0000	379.0000	1040.0000
Trimethylbenzene, 1,2,3-	0.0391	0.0675	-	-	-	1040.0000
Trimethylbenzene, 1,2,4-	0.0391	0.0675	-	-	-	1040.0000

Chemical	$DA_{event(nc\ child)}$	$DA_{event(nc\ adult)}$	Ingestion SL TR=1E-06 (ug/L)	Dermal SL TR=1E-06 (ug/L)	Carcinogenic SL TR=1E-06 (ug/L)	Ingestion SL (Child) THQ=0.1 (ug/L)
Trimethylbenzene, 1,3,5-	0.0391	0.0675	-	-	-	1040.0000
Trimethylpentene, 2,4,4-	0.0391	0.0675	-	-	-	1040.0000
Trinitrobenzene, 1,3,5-	0.1173	0.2026	-	-	-	3110.0000
Trinitrotoluene, 2,4,6-	0.0020	0.0034	256.0000	983.0000	203.0000	51.8000
Triphenylphosphine Oxide	0.0782	0.1351	-	-	-	2070.0000
Tripotassium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Tris(1,3-Dichloro-2-propyl) Phosphate	0.0782	0.1351	-	-	-	2070.0000
Tris(1-chloro-2-propyl)phosphate	0.0391	0.0675	-	-	-	1040.0000
Tris(2,3-dibromopropyl)phosphate	-	-	3.3400	-	3.3400	-
Tris(2-chloroethyl)phosphate	0.0274	0.0473	385.0000	2750.0000	337.0000	726.0000
Tris(2-ethylhexyl)phosphate	-	-	2400.0000	-	2400.0000	10400.0000
Trisbutoxyethyl Phosphate	-	-	-	-	-	-
Trisodium phosphate	190.0200	328.2386	-	-	-	5040000.0000
Tungsten	0.0031	0.0054	-	-	-	83.0000
Uranium	0.0008	0.0014	-	-	-	20.7000
Urethane	-	-	1.8400	47.3000	1.7800	-
Vanadium Pentoxide	0.0009	0.0016	-	-	-	933.0000
Vanadium and Compounds	0.0005	0.0009	-	-	-	523.0000
Vernolate	0.0039	0.0068	-	-	-	104.0000
Vinclozolin	0.0047	0.0081	-	-	-	124.0000
Vinyl Acetate	3.9099	6.7539	-	-	-	104000.0000
Vinyl Bromide	-	-	-	-	-	-
Vinyl Chloride	0.0117	0.0203	0.0861	0.1580	0.0557	311.0000
Warfarin	0.0012	0.0020	-	-	-	31.1000
Xylene, m-	0.7820	1.3508	-	-	-	20700.0000
Xylene, o-	0.7820	1.3508	-	-	-	20700.0000
Xylene, p-	0.7820	1.3508	-	-	-	20700.0000
Xylenes	0.7820	1.3508	-	-	-	20700.0000
Zinc Cyanide	0.1955	0.3377	-	-	-	5180.0000
Zinc Phosphide	0.0012	0.0020	-	-	-	31.1000
Zinc and Compounds	1.1730	2.0262	-	-	-	31100.0000
Zineb	0.1955	0.3377	-	-	-	5180.0000
Zirconium	0.0003	0.0005	-	-	-	8.3000

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Site-specific

Recreator Regional Screening Level

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSre nc SL < 10X ca SL; SSL values are based on DAF=1; max = c Csat exceeded.

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Acenaphthene	772.0000	687.0000	36200.0000	1330.0000
Acephate	28400.0000	124.0000	724.0000	49100.0000
Acetaldehyde	-	-	-	-
Acetochlor	2430.0000	1120.0000	12100.0000	4200.0000
Acetone	2810000.0000	90300.0000	543000.0000	4860000.0000
Acetone Cyanohydrin	-	-	-	-
Acetonitrile	-	-	-	-
Acetophenone	35300.0000	8020.0000	60300.0000	61000.0000
Acetylaminofluorene, 2-	-	-	-	-
Acrolein	1080.0000	49.5000	302.0000	1860.0000
Acrylamide	13800.0000	204.0000	1210.0000	23900.0000
Acrylic Acid	737000.0000	48400.0000	302000.0000	1270000.0000
Acrylonitrile	55900.0000	3860.0000	24100.0000	96600.0000
Adiponitrile	-	-	-	-
Alachlor	573.0000	369.0000	6030.0000	990.0000
Aldicarb	1200.0000	95.4000	603.0000	2070.0000
Aldicarb Sulfone	19800.0000	103.0000	603.0000	34300.0000
Aldrin	-	3.1100	18.1000	-
Allyl Alcohol	8350.0000	488.0000	3020.0000	14400.0000
Allyl Chloride	-	-	-	-
Aluminum	1950000.0000	98500.0000	603000.0000	3380000.0000
Aluminum Phosphide	782.0000	39.4000	241.0000	1350.0000
Aluminum metaphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Ametryn	807.0000	433.0000	5430.0000	1390.0000
Aminobiphenyl, 4-	-	-	-	-
Aminophenol, m-	208000.0000	7980.0000	48300.0000	359000.0000
Aminophenol, o-	5550.0000	386.0000	2410.0000	9580.0000
Aminophenol, p-	67200.0000	2010.0000	12100.0000	116000.0000
Amitraz	8.0800	7.8300	1510.0000	14.0000
Ammonium Perchlorate	1370.0000	68.9000	422.0000	2360.0000
Ammonium Sulfamate	391000.0000	19700.0000	121000.0000	675000.0000
Ammonium polyphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Amyl Alcohol, tert-	-	-	-	-
Aniline	5470.0000	641.0000	4220.0000	9450.0000
Anthracene	2070.0000	1940.0000	181000.0000	3570.0000
Anthraquinone, 9,10-	94.2000	64.8000	1210.0000	163.0000
Antimony (metallic)	117.0000	30.6000	241.0000	203.0000
Antimony Pentoxide	147.0000	38.3000	302.0000	253.0000
Antimony Potassium Tartrate	-	-	-	-
Antimony Tetroxide	117.0000	30.6000	241.0000	203.0000
Antimony Trichloride	-	-	-	-
Antimony Trioxide	-	-	-	-
Aroclor 1016	-	7.2600	42.2000	-
Aroclor 1221	-	-	-	-
Aroclor 1232	-	-	-	-
Aroclor 1242	-	-	-	-
Aroclor 1248	-	-	-	-
Aroclor 1254	-	2.0700	12.1000	-
Aroclor 1260	-	-	-	-
Aroclor 5460	-	62.2000	362.0000	-
Arsenic, Inorganic	586.0000	29.5000	181.0000	1010.0000
Arsine	6.8400	0.3450	2.1100	11.8000
Asulam	476000.0000	3700.0000	21700.0000	822000.0000

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Atrazine	5130.0000	2130.0000	21100.0000	8860.0000
Auramine	-	-	-	-
Avermectin B1	-	41.5000	241.0000	-
Azinphos-methyl	684.0000	214.0000	1810.0000	1180.0000
Azobenzene	-	-	-	-
Azodicarbonamide	51400000.0000	103000.0000	603000.0000	88700000.0000
Barium	27400.0000	11800.0000	121000.0000	47300.0000
Benfluralin	32.9000	30.9000	3020.0000	56.8000
Benomyl	25200.0000	4300.0000	30200.0000	43500.0000
Bensulfuron-methyl	200000.0000	18800.0000	121000.0000	345000.0000
Bentazon	7800.0000	2220.0000	18100.0000	13500.0000
Benz[a]anthracene	-	-	-	-
Benzaldehyde	36300.0000	8070.0000	60300.0000	62800.0000
Benzene	418.0000	208.0000	2410.0000	723.0000
Benzenediamine-2-methyl sulfate, 1,4-	-	31.1000	181.0000	-
Benzenethiol	78.5000	44.7000	603.0000	136.0000
Benzidine	2500.0000	277.0000	1810.0000	4310.0000
Benzo(j)fluoranthene	-	-	-	-
Benzo[a]pyrene	-	31.1000	181.0000	-
Benzo[b]fluoranthene	-	-	-	-
Benzo[k]fluoranthene	-	-	-	-
Benzoic Acid	925000.0000	286000.0000	2410000.0000	1600000.0000
Benzotrichloride	-	-	-	-
Benzyl Alcohol	65900.0000	8960.0000	60300.0000	114000.0000
Benzyl Chloride	250.0000	113.0000	1210.0000	432.0000
Beryllium and compounds	27.4000	24.2000	1210.0000	47.3000
Bifenox	190.0000	158.0000	5430.0000	328.0000
Biphenthrin	-	1560.0000	9050.0000	-
Biphenyl, 1,1'-	5860.0000	5260.0000	302000.0000	10100.0000
Bis(2-chloro-1-methylethyl) ether	5360.0000	2340.0000	24100.0000	9260.0000
Bis(2-chloroethoxy)methane	2490.0000	276.0000	1810.0000	4290.0000
Bis(2-chloroethyl)ether	-	-	-	-
Bis(2-ethylhexyl)phthalate	-	2070.0000	12100.0000	-
Bis(chloromethyl)ether	-	-	-	-
Bisphenol A	2680.0000	1770.0000	30200.0000	4630.0000
Boron And Borates Only	391000.0000	19700.0000	121000.0000	675000.0000
Boron Trichloride	3910000.0000	197000.0000	1210000.0000	6750000.0000
Boron Trifluoride	78200.0000	3940.0000	24100.0000	135000.0000
Bromate	7820.0000	394.0000	2410.0000	13500.0000
Bromo-2-chloroethane, 1-	-	-	-	-
Bromo-3-fluorobenzene, 1-	21.1000	12.6000	181.0000	36.4000
Bromo-4-fluorobenzene, 1-	16.5000	10.8000	181.0000	28.4000
Bromobenzene	438.0000	287.0000	4830.0000	757.0000
Bromochloromethane	-	-	-	-
Bromodichloromethane	5340.0000	1490.0000	12100.0000	9220.0000
Bromoform	5150.0000	1480.0000	12100.0000	8890.0000
Bromomethane	713.0000	121.0000	845.0000	1230.0000
Bromophos	45.4000	41.8000	3020.0000	78.4000
Bromopropane, 1-	-	-	-	-
Bromoxynil	1100.0000	645.0000	9050.0000	1900.0000
Bromoxynil Octanoate	130.0000	120.0000	9050.0000	224.0000
Butadiene, 1,3-	-	-	-	-
Butanoic acid, 4-(2,4-dichlorophenoxy)-	1480.0000	1000.0000	18100.0000	2560.0000
Butanol, N-	66700.0000	8970.0000	60300.0000	115000.0000
Butyl Benzyl Phthalate	2380.0000	2130.0000	121000.0000	4100.0000
Butyl Formate, tert-	-	-	-	-
Butyl alcohol, sec-	2010000.0000	188000.0000	1210000.0000	3480000.0000
Butylate	702.0000	618.0000	30200.0000	1210.0000
Butylated hydroxyanisole	-	-	-	-
Butylated hydroxytoluene	1000.0000	971.0000	181000.0000	1730.0000
Butylbenzene, n-	-	5180.0000	30200.0000	-

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Butylbenzene, sec-	-	10400.0000	60300.0000	-
Butylbenzene, tert-	871.0000	804.0000	60300.0000	1510.0000
Butylphthalyl Butylglycolate	33800.0000	25500.0000	603000.0000	58300.0000
Cacodylic Acid	52400.0000	1990.0000	12100.0000	90500.0000
Cadmium (Water)	48.9000	25.2000	302.0000	84.4000
Calcium Cyanide	1950.0000	98.5000	603.0000	3380.0000
Calcium pyrophosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Caprolactam	674000.0000	48100.0000	302000.0000	1160000.0000
Captafol	125.0000	78.1000	1210.0000	216.0000
Captan	24700.0000	8720.0000	78400.0000	42600.0000
Carbaryl	19600.0000	6780.0000	60300.0000	33800.0000
Carbofuran	1180.0000	361.0000	3020.0000	2040.0000
Carbon Disulfide	13700.0000	5900.0000	60300.0000	23600.0000
Carbon Tetrachloride	274.0000	165.0000	2410.0000	473.0000
Carbonyl Sulfide	-	-	-	-
Carbosulfan	57.3000	54.3000	6030.0000	98.9000
Carboxin	34200.0000	7960.0000	60300.0000	59000.0000
Ceric oxide	-	-	-	-
Chloral	-	-	-	-
Chloral Hydrate	126000.0000	9580.0000	60300.0000	218000.0000
Chloramben	6100.0000	1240.0000	9050.0000	10500.0000
Chloranil	-	-	-	-
Chlordane (technical mixture)	1.4700	1.4300	302.0000	2.5300
Chlordecone (Kepone)	4.4900	3.9200	181.0000	7.7500
Chlorfenvinphos	46.1000	28.2000	422.0000	79.7000
Chlorimuron, Ethyl-	56600.0000	8010.0000	54300.0000	97800.0000
Chlorine	195000.0000	9850.0000	60300.0000	338000.0000
Chlorine Dioxide	58600.0000	2950.0000	18100.0000	101000.0000
Chlorite (Sodium Salt)	58600.0000	2950.0000	18100.0000	101000.0000
Chloro-1,1-difluoroethane, 1-	-	-	-	-
Chloro-1,3-butadiene, 2-	1290.0000	793.0000	12100.0000	2220.0000
Chloro-2-methylaniline HCl, 4-	-	-	-	-
Chloro-2-methylaniline, 4-	442.0000	183.0000	1810.0000	764.0000
Chloroacetaldehyde, 2-	-	-	-	-
Chloroacetophenone, 2-	-	-	-	-
Chloroaniline, p-	1030.0000	295.0000	2410.0000	1770.0000
Chlorobenzene	993.0000	671.0000	12100.0000	1710.0000
Chlorobenzene sulfonic acid, p-	1520000.0000	10300.0000	60300.0000	2630000.0000
Chlorobenzilate	286.0000	252.0000	12100.0000	494.0000
Chlorobenzoic Acid, p-	2740.0000	1460.0000	18100.0000	4740.0000
Chlorobenzotrifluoride, 3-nitro-4-	-	-	-	-
Chlorobenzotrifluoride, 4-	77.0000	61.7000	1810.0000	133.0000
Chlorobutane, 1-	2250.0000	1460.0000	24100.0000	3890.0000
Chlorodifluoromethane	-	-	-	-
Chloroethanol, 2-	52100.0000	1990.0000	12100.0000	90000.0000
Chloroform	1940.0000	676.0000	6030.0000	3350.0000
Chloromethane	-	-	-	-
Chloromethyl Methyl Ether	-	-	-	-
Chloronaphthalene, Beta-	1150.0000	1010.0000	48300.0000	1990.0000
Chloronitrobenzene, o-	518.0000	194.0000	1810.0000	895.0000
Chloronitrobenzene, p-	96.1000	41.4000	422.0000	166.0000
Chlorophenol, 2-	796.0000	314.0000	3020.0000	1370.0000
Chloropicrin	-	-	-	-
Chlorothalonil	1720.0000	818.0000	9050.0000	2980.0000
Chlorotoluene, o-	466.0000	380.0000	12100.0000	805.0000
Chlorotoluene, p-	533.0000	424.0000	12100.0000	921.0000
Chlorozotocin	-	-	-	-
Chlorpropham	2030.0000	1460.0000	30200.0000	3500.0000
Chlorpyrifos	12.0000	10.8000	603.0000	20.8000
Chlorpyrifos Methyl	241.0000	195.0000	6030.0000	416.0000
Chlorsulfuron	46800.0000	4670.0000	30200.0000	80900.0000

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Chlorthal-dimethyl	269.0000	213.0000	6030.0000	464.0000
Chlorthiophos	2.8300	2.7400	483.0000	4.9000
Chromium(III), Insoluble Salts	38100.0000	30600.0000	905000.0000	65900.0000
Chromium(VI)	73.3000	59.3000	1810.0000	127.0000
Chrysene	-	-	-	-
Clofentezine	1760.0000	764.0000	7840.0000	3040.0000
Cobalt	1470.0000	30.5000	181.0000	2530.0000
Copper	78200.0000	3940.0000	24100.0000	135000.0000
Copper Cyanide	9770.0000	492.0000	3020.0000	16900.0000
Cresol, m-	8940.0000	3280.0000	30200.0000	15400.0000
Cresol, o-	9070.0000	3300.0000	30200.0000	15700.0000
Cresol, p-	18400.0000	6630.0000	60300.0000	31800.0000
Cresol, p-chloro-m-	4210.0000	2990.0000	60300.0000	7270.0000
Cresols	5530.0000	3600.0000	60300.0000	9540.0000
Crotonaldehyde, trans-	979.0000	93.8000	603.0000	1690.0000
Cumene	1560.0000	1360.0000	60300.0000	2700.0000
Cupferron	-	-	-	-
Cyanazine	625.0000	156.0000	1210.0000	1080.0000
Cyanide (CN-)	1170.0000	59.1000	362.0000	2030.0000
Cyanogen	2200.0000	99.0000	603.0000	3790.0000
Cyanogen Bromide	690000.0000	9210.0000	54300.0000	1190000.0000
Cyanogen Chloride	248000.0000	5080.0000	30200.0000	429000.0000
Cyclohexane	-	-	-	-
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	886.0000	621.0000	12100.0000	1530.0000
Cyclohexanone	4700000.0000	467000.0000	3020000.0000	8110000.0000
Cyclohexene	186.0000	137.0000	3020.0000	322.0000
Cyclohexylamine	67300.0000	15900.0000	121000.0000	116000.0000
Cyclopentadiene	-	-	-	-
Cyfluthrin	130.0000	124.0000	15100.0000	225.0000
Cyhalothrin	-	104.0000	603.0000	-
Cyromazine	663000.0000	48100.0000	302000.0000	1140000.0000
DDD, p,p`- (DDD)	0.0585	0.0575	18.1000	0.1010
DDE, p,p'-	-	31.1000	181.0000	-
DDT	-	51.8000	302.0000	-
Dalapon	43300.0000	2900.0000	18100.0000	74700.0000
Daminozide	8050000.0000	15500.0000	90500.0000	13900000.0000
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	-	726.0000	4220.0000	-
Decane	-	-	-	-
Demeton	0.7290	0.6200	24.1000	1.2600
Di(2-ethylhexyl)adipate	-	62200.0000	362000.0000	-
Diallate	-	-	-	-
Diammonium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Diazinon	32.4000	22.4000	422.0000	56.0000
Dibenz[a,h]anthracene	-	-	-	-
Dibenzo(a,e)pyrene	-	-	-	-
Dibenzofuran	10.7000	9.7000	603.0000	18.5000
Dibenzothiophene	79.7000	74.0000	6030.0000	138.0000
Dibromo-3-chloropropane, 1,2-	19.6000	10.1000	121.0000	33.9000
Dibromobenzene, 1,3-	13.0000	9.8800	241.0000	22.4000
Dibromobenzene, 1,4-	306.0000	236.0000	6030.0000	528.0000
Dibromochloromethane	5570.0000	1510.0000	12100.0000	9630.0000
Dibromoethane, 1,2-	2970.0000	710.0000	5430.0000	5140.0000
Dibromomethane (Methylene Bromide)	-	-	-	-
Dibutyl Phthalate	1360.0000	1200.0000	60300.0000	2340.0000
Dibutyltin Compounds	-	31.1000	181.0000	-
Dibutyltin dichloride	-	-	-	-
Dicalcium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Dicamba	8400.0000	2270.0000	18100.0000	14500.0000
Dichloro-2-butene, 1,4-	-	-	-	-

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Dichloro-2-butene, cis-1,4-	-	-	-	-
Dichloro-2-butene, trans-1,4-	-	-	-	-
Dichloroacetic Acid	4160.0000	377.0000	2410.0000	7190.0000
Dichlorobenzene, 1,2-	2360.0000	1890.0000	54300.0000	4080.0000
Dichlorobenzene, 1,3-	-	-	-	-
Dichlorobenzene, 1,4-	1810.0000	1450.0000	42200.0000	3130.0000
Dichlorobenzidine, 3,3'-	-	-	-	-
Dichlorobenzophenone, 4,4'-	113.0000	101.0000	5430.0000	195.0000
Dichlorobenzotrifluoride, 3,4-	-	-	-	-
Dichlorodifluoromethane	29500.0000	12200.0000	121000.0000	50900.0000
Dichlorodiisopropyl ether, 2,2'-	-	-	-	-
Dichloroethane, 1,1-	42600.0000	13900.0000	121000.0000	73500.0000
Dichloroethane, 1,2-	2040.0000	477.0000	3620.0000	3530.0000
Dichloroethylene, 1,1-	6230.0000	2830.0000	30200.0000	10800.0000
Dichloroethylene, 1,2-cis-	265.0000	116.0000	1210.0000	457.0000
Dichloroethylene, 1,2-trans-	2650.0000	1160.0000	12100.0000	4570.0000
Dichlorophenol, 2,4-	157.0000	104.0000	1810.0000	271.0000
Dichlorophenoxy Acetic Acid, 2,4-	1120.0000	538.0000	6030.0000	1930.0000
Dichloropropane, 1,2-	7230.0000	2640.0000	24100.0000	12500.0000
Dichloropropane, 1,3-	3510.0000	1300.0000	12100.0000	6070.0000
Dichloropropanol, 2,3-	3840.0000	288.0000	1810.0000	6640.0000
Dichloropropene, 1,3-	4950.0000	1910.0000	18100.0000	8540.0000
Dichlorvos	461.0000	46.6000	302.0000	797.0000
Dicrotophos	274.0000	3.0800	18.1000	474.0000
Dicyclopentadiene	2840.0000	2110.0000	48300.0000	4900.0000
Dieldrin	0.5070	0.4620	30.2000	0.8760
Diethanolamine	61600.0000	207.0000	1210.0000	106000.0000
Diethyl Phthalate	164000.0000	55000.0000	483000.0000	283000.0000
Diethyl-meta-Toluamide, N,N (DEET)	-	-	-	-
Diethylene Glycol Monobutyl Ether	71600.0000	2980.0000	18100.0000	124000.0000
Diethylene Glycol Monoethyl Ether	609000.0000	6160.0000	36200.0000	1050000.0000
Diethylformamide	3090.0000	100.0000	603.0000	5330.0000
Diethylstilbestrol	-	-	-	-
Difenzoquat	623000.0000	8490.0000	50100.0000	1080000.0000
Diflubenzuron	864.0000	610.0000	12100.0000	1490.0000
Difluoroethane, 1,1-	-	-	-	-
Difluoropropane, 2,2-	-	-	-	-
Dihydrosafrole	-	-	-	-
Diisopropyl Ether	-	-	-	-
Diisopropyl Methylphosphonate	105000.0000	7690.0000	48300.0000	181000.0000
Dimagnesium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Dimethipin	217000.0000	2240.0000	13200.0000	375000.0000
Dimethoate	5800.0000	219.0000	1330.0000	10000.0000
Dimethoxybenzidine, 3,3'-	-	-	-	-
Dimethyl methylphosphonate	622000.0000	6160.0000	36200.0000	1070000.0000
Dimethylamino azobenzene [p-]	-	-	-	-
Dimethylaniline HCl, 2,4-	-	-	-	-
Dimethylaniline, 2,4-	612.0000	155.0000	1210.0000	1060.0000
Dimethylaniline, N,N-	236.0000	110.0000	1210.0000	407.0000
Dimethylbenz(a)anthracene, 7,12-	-	-	-	-
Dimethylbenzidine, 3,3'-	-	-	-	-
Dimethylformamide	1180000.0000	10300.0000	60300.0000	2050000.0000
Dimethylhydrazine, 1,1-	1370.0000	10.3000	60.3000	2370.0000
Dimethylhydrazine, 1,2-	-	-	-	-
Dimethylphenol, 2,4-	2410.0000	1120.0000	12100.0000	4170.0000
Dimethylphenol, 2,6-	65.8000	32.0000	362.0000	114.0000
Dimethylphenol, 3,4-	134.0000	58.4000	603.0000	231.0000
Dimethylphthalate	-	-	-	-
Dimethylterephthalate	22100.0000	7060.0000	60300.0000	38200.0000
Dimethylvinylchloride	-	-	-	-
Dinitro-o-cresol, 4,6-	21.8000	6.0100	48.3000	37.7000

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Dinitro-o-cyclohexyl Phenol, 4,6-	44.8000	36.8000	1210.0000	77.4000
Dinitrobenzene, 1,2-	44.0000	8.3900	60.3000	76.1000
Dinitrobenzene, 1,3-	60.0000	8.8400	60.3000	104.0000
Dinitrobenzene, 1,4-	62.5000	8.8900	60.3000	108.0000
Dinitrophenol, 2,4-	1010.0000	172.0000	1210.0000	1740.0000
Dinitrotoluene Mixture, 2,4/2,6-	-	-	-	-
Dinitrotoluene, 2,4-	619.0000	155.0000	1210.0000	1070.0000
Dinitrotoluene, 2,6-	77.3000	22.2000	181.0000	134.0000
Dinitrotoluene, 2-Amino-4,6-	42.4000	8.3300	60.3000	73.3000
Dinitrotoluene, 4-Amino-2,6-	42.4000	8.3300	60.3000	73.3000
Dinitrotoluene, Technical grade	24.6000	19.5000	543.0000	42.5000
Dinoseb	44.7000	31.2000	603.0000	77.2000
Dioxane, 1,4-	133000.0000	3040.0000	18100.0000	230000.0000
Diphenamid	3510.0000	1650.0000	18100.0000	6070.0000
Diphenyl Ether	-	-	-	-
Diphenyl Sulfone	165.0000	55.2000	483.0000	284.0000
Diphenylamine	2780.0000	2190.0000	60300.0000	4800.0000
Diphenylhydrazine, 1,2-	-	-	-	-
Dipotassium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Diquat	-	228.0000	1330.0000	-
Direct Black 38	-	-	-	-
Direct Blue 6	-	-	-	-
Direct Brown 95	-	-	-	-
Disodium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Disulfoton	1.1000	0.8710	24.1000	1.9000
Dithiane, 1,4-	12100.0000	955.0000	6030.0000	20900.0000
Diundecyl Phthalate	-	-	-	-
Diuron	295.0000	122.0000	1210.0000	509.0000
Dodine	43600.0000	1980.0000	12100.0000	75200.0000
EPTC	2470.0000	1670.0000	30200.0000	4270.0000
Endosulfan	522.0000	284.0000	3620.0000	901.0000
Endosulfan Sulfate	752.0000	340.0000	3620.0000	1300.0000
Endothall	7060.0000	1600.0000	12100.0000	12200.0000
Endrin	3.0400	2.7700	181.0000	5.2600
Epichlorohydrin	9240.0000	583.0000	3620.0000	16000.0000
Epoxybutane, 1,2-	-	-	-	-
Ethanol, 2-(2-methoxyethoxy)-	962000.0000	4130.0000	24100.0000	1660000.0000
Ethephon	33700.0000	511.0000	3020.0000	58200.0000
Ethion	6.3400	5.6500	302.0000	10.9000
Ethoxyethanol Acetate, 2-	177000.0000	9800.0000	60300.0000	306000.0000
Ethoxyethanol, 2-	439000.0000	9140.0000	54300.0000	759000.0000
Ethyl Acetate	869000.0000	84300.0000	543000.0000	1500000.0000
Ethyl Acrylate	2190.0000	419.0000	3020.0000	3790.0000
Ethyl Chloride	-	-	-	-
Ethyl Ether	131000.0000	17900.0000	121000.0000	227000.0000
Ethyl Methacrylate	-	-	-	-
Ethyl-p-nitrophenyl Phosphonate	0.1330	0.1180	6.0300	0.2290
Ethylbenzene	2980.0000	2320.0000	60300.0000	5160.0000
Ethylene Cyanohydrin	732000.0000	7190.0000	42200.0000	1270000.0000
Ethylene Diamine	-	9330.0000	54300.0000	-
Ethylene Glycol	36100000.0000	206000.0000	1210000.0000	62400000.0000
Ethylene Glycol Monobutyl Ether	109000.0000	9470.0000	60300.0000	189000.0000
Ethylene Oxide	-	-	-	-
Ethylene Thiourea	739.0000	8.2000	48.3000	1280.0000
Ethyleneimine	-	-	-	-
Ethylphthalyl Ethyl Glycolate	1280000.0000	250000.0000	1810000.0000	2200000.0000
Fenamiphos	27.8000	13.4000	151.0000	48.0000
Fenpropathrin	60.7000	59.3000	15100.0000	105.0000
Fenvalerate	-	2590.0000	15100.0000	-
Fluometuron	2840.0000	914.0000	7840.0000	4910.0000
Fluoranthene	-	4150.0000	24100.0000	-

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Fluorene	384.0000	352.0000	24100.0000	663.0000
Fluoride	78200.0000	3940.0000	24100.0000	135000.0000
Fluorine (Soluble Fluoride)	117000.0000	5910.0000	36200.0000	203000.0000
Fluorobenzene	-	-	-	-
Fluridone	11700.0000	4860.0000	48300.0000	20200.0000
Flurprimidol	3990.0000	2030.0000	24100.0000	6890.0000
Flusilazole	117.0000	74.8000	1210.0000	202.0000
Flutolanil	30800.0000	19300.0000	302000.0000	53300.0000
Fluvalinate	-	1040.0000	6030.0000	-
Folpet	15400.0000	5810.0000	54300.0000	26600.0000
Fomesafen	997.0000	206.0000	1510.0000	1720.0000
Fonofos	51.9000	41.5000	1210.0000	89.6000
Formaldehyde	187000.0000	18700.0000	121000.0000	322000.0000
Formic Acid	3910000.0000	91100.0000	543000.0000	6760000.0000
Fosetyl-AL	-	259000.0000	1510000.0000	-
Furan	312.0000	77.8000	603.0000	539.0000
Furazolidone	-	-	-	-
Furfural	5080.0000	293.0000	1810.0000	8780.0000
Furium	-	-	-	-
Furmecyclox	-	-	-	-
Gadolinium	-	-	-	-
Glufosinate, Ammonium	-	622.0000	3620.0000	-
Glutaraldehyde	435000.0000	10100.0000	60300.0000	752000.0000
Glycidyl	1200.0000	40.1000	241.0000	2070.0000
Glyphosate	-	10400.0000	60300.0000	-
Guanidine	265000.0000	1030.0000	6030.0000	457000.0000
Guanidine Chloride	-	2070.0000	12100.0000	-
Guanidine Nitrate	-	3110.0000	18100.0000	-
Haloxyfop, Methyl	2.5300	1.7000	30.2000	4.3800
Heptachlor	1.2100	1.1900	302.0000	2.1000
Heptachlor Epoxide	0.1950	0.1700	7.8400	0.3370
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	-	2.4200	14.1000	-
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	-	0.0073	0.0422	-
Heptanal, n-	-	-	-	-
Heptane, N-	-	31.1000	181.0000	-
Hexabromobenzene	-	207.0000	1210.0000	-
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	-	20.7000	121.0000	-
Hexachlorobenzene	-	83.0000	483.0000	-
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	-	2.4200	14.1000	-
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	-	2.4200	14.1000	-
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	-	2.4200	14.1000	-
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	-	0.0024	0.0141	-
Hexachlorobutadiene	7.8800	7.3200	603.0000	13.6000
Hexachlorocyclohexane, Alpha-	204.0000	164.0000	4830.0000	353.0000
Hexachlorocyclohexane, Beta-	-	-	-	-
Hexachlorocyclohexane, Gamma- (Lindane)	7.6500	6.1400	181.0000	13.2000
Hexachlorocyclohexane, Technical	-	-	-	-
Hexachlorocyclopentadiene	34.4000	32.6000	3620.0000	59.4000
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	-	0.0007	0.0042	-
Hexachlorodibenzo-p-dioxin, Mixture	-	-	-	-
Hexachlorodibenzofuran, 1,2,3,4,7,8-	-	0.0007	0.0042	-
Hexachloroethane	11.3000	9.7800	422.0000	19.5000
Hexachlorophene	-	31.1000	181.0000	-
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	8770.0000	396.0000	2410.0000	15100.0000
Hexamethylene Diisocyanate, 1,6-	-	-	-	-
Hexamethylene diisocyanate biuret	-	-	-	-
Hexamethylene diisocyanate isocyanurate	-	-	-	-
Hexamethylphosphoramide	1640.0000	40.5000	241.0000	2830.0000
Hexane, Commercial	-	-	-	-
Hexane, N-	-	-	-	-
Hexanedioic Acid	8620000.0000	203000.0000	1210000.0000	14900000.0000

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	4700.0000	2850.0000	42200.0000	8110.0000
Hexanone, 2-	2000.0000	412.0000	3020.0000	3460.0000
Hexazinone	19600.0000	2910.0000	19900.0000	33900.0000
Hexythiazox	120.0000	114.0000	15100.0000	207.0000
HpCDD, 1,2,3,4,6,7,8,-	-	0.0073	0.0422	-
HpCDF, 1,2,3,4,7,8,9-	-	0.0073	0.0422	-
HxCDD, 1,2,3,6,7,8-	-	0.0007	0.0042	-
HxCDD, 1,2,3,7,8,9-	-	0.0007	0.0042	-
HxCDF, 1,2,3,6,7,8-	-	0.0007	0.0042	-
HxCDF, 1,2,3,7,8,9-	-	0.0007	0.0042	-
HxCDF, 2,3,4,6,7,8-	-	0.0007	0.0042	-
Hydramethylnon	24000.0000	1640.0000	10300.0000	41400.0000
Hydrazine	-	-	-	-
Hydrazine Sulfate	-	-	-	-
Hydrogen Chloride	-	-	-	-
Hydrogen Cyanide	1170.0000	59.1000	362.0000	2030.0000
Hydrogen Fluoride	78200.0000	3940.0000	24100.0000	135000.0000
Hydrogen Sulfide	-	-	-	-
Hydroquinone	58600.0000	3870.0000	24100.0000	101000.0000
Imazalil	109.0000	76.6000	1510.0000	188.0000
Imazaquin	215000.0000	23100.0000	151000.0000	371000.0000
Imazethapyr	597000.0000	181000.0000	1510000.0000	1030000.0000
Indeno[1,2,3-cd]pyrene	-	-	-	-
Iodine	19500.0000	985.0000	6030.0000	33800.0000
Iprodione	7520.0000	2670.0000	24100.0000	13000.0000
Iron	1370000.0000	68900.0000	422000.0000	2360000.0000
Isobutyl Alcohol	241000.0000	27500.0000	181000.0000	416000.0000
Isophorone	68200.0000	15900.0000	121000.0000	118000.0000
Isopropalin	38.0000	37.1000	9050.0000	65.7000
Isopropanol	4100000.0000	197000.0000	1210000.0000	7080000.0000
Isopropyl Methyl Phosphonic Acid	304000.0000	10000.0000	60300.0000	525000.0000
Isoxaben	2270.0000	1580.0000	30200.0000	3910.0000
JP-4	-	-	-	-
JP-5	-	-	-	-
JP-7	-	-	-	-
JP-8	-	-	-	-
Kerosene	-	-	-	-
Lactofen	221.0000	175.0000	4830.0000	382.0000
Lactonitrile	2090.0000	20.5000	121.0000	3610.0000
Lanthanum	97.7000	4.9200	30.2000	169.0000
Lanthanum Acetate Hydrate	-	2.1600	12.5000	-
Lanthanum Chloride Heptahydrate	36.6000	1.8400	11.3000	63.1000
Lanthanum Chloride, Anhydrous	55.3000	2.7900	17.1000	95.6000
Lanthanum Nitrate Hexahydrate	31.3000	1.5800	9.6500	54.0000
Lead Phosphate	-	-	-	-
Lead acetate	-	-	-	-
Lead subacetate	-	-	-	-
Lewisite	0.7500	0.3070	3.0200	1.3000
Linuron	631.0000	353.0000	4650.0000	1090.0000
Lithium	3910.0000	197.0000	1210.0000	6750.0000
Lithium Perchlorate	1370.0000	68.9000	422.0000	2360.0000
Lutetium	-	-	-	-
MCPA	25.0000	16.9000	302.0000	43.2000
MCPB	200.0000	139.0000	2650.0000	345.0000
MCPP	59.0000	37.6000	603.0000	102.0000
Malathion	9030.0000	1690.0000	12100.0000	15600.0000
Maleic Anhydride	27400.0000	7520.0000	60300.0000	47300.0000
Maleic Hydrazide	6630000.0000	51400.0000	302000.0000	11400000.0000
Malononitrile	590.0000	10.2000	60.3000	1020.0000
Mancozeb	4080.0000	1760.0000	18100.0000	7040.0000
Maneb	2980.0000	442.0000	3020.0000	5150.0000

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Manganese (Non-diet)	1880.0000	1070.0000	14500.0000	3240.0000
Mephosfolan	206.0000	8.9300	54.3000	356.0000
Mepiquat Chloride	-	3110.0000	18100.0000	-
Mercaptobenzothiazole, 2-	573.0000	241.0000	2410.0000	990.0000
Mercuric Chloride	41.1000	17.7000	181.0000	70.9000
Mercury (elemental)	-	-	-	-
Merphos	-	3.1100	18.1000	-
Merphos Oxide	0.2730	0.2660	60.3000	0.4720
Metalaxyl	52700.0000	5560.0000	36200.0000	91000.0000
Methacrylonitrile	84.4000	9.2300	60.3000	146.0000
Methamidophos	797.0000	5.1500	30.2000	1380.0000
Methanol	10600000.0000	203000.0000	1210000.0000	18300000.0000
Methidathion	722.0000	128.0000	905.0000	1250.0000
Methomyl	56200.0000	2480.0000	15100.0000	97100.0000
Methoxy-5-nitroaniline, 2-	-	-	-	-
Methoxychlor	48.5000	44.4000	3020.0000	83.8000
Methoxyethanol Acetate, 2-	26700.0000	805.0000	4830.0000	46000.0000
Methoxyethanol, 2-	42400.0000	512.0000	3020.0000	73300.0000
Methyl Acetate	1940000.0000	98400.0000	603000.0000	3350000.0000
Methyl Acrylate	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	964000.0000	58400.0000	362000.0000	1670000.0000
Methyl Hydrazine	9500.0000	103.0000	603.0000	16400.0000
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	-	-	-	-
Methyl Isocyanate	-	-	-	-
Methyl Mercury	195.0000	9.8500	60.3000	338.0000
Methyl Methacrylate	561000.0000	115000.0000	845000.0000	969000.0000
Methyl Parathion	34.0000	14.7000	151.0000	58.7000
Methyl Phosphonic Acid	875000.0000	6180.0000	36200.0000	1510000.0000
Methyl Styrene (Mixed Isomers)	35.6000	33.7000	3620.0000	61.6000
Methyl methanesulfonate	-	-	-	-
Methyl tert-Butyl Ether (MTBE)	-	-	-	-
Methyl-1,4-benzenediamine dihydrochloride, 2-	48800.0000	31.1000	181.0000	84300.0000
Methyl-2-Pentanol, 4-	-	-	-	-
Methyl-5-Nitroaniline, 2-	5840.0000	1530.0000	12100.0000	10100.0000
Methyl-N-nitro-N-nitrosoguanidine, N-	-	-	-	-
Methylaniline Hydrochloride, 2-	-	-	-	-
Methylarsonic acid	285000.0000	1030.0000	6030.0000	492000.0000
Methylbenzene,1-4-diamine monohydrochloride, 2-	-	20.7000	121.0000	-
Methylbenzene-1,4-diamine sulfate, 2-	-	31.1000	181.0000	-
Methylcholanthrene, 3-	-	-	-	-
Methylcyclopentane	-	-	-	-
Methylene Chloride	2540.0000	500.0000	3620.0000	4380.0000
Methylene-bis(2-chloroaniline), 4,4'-	62.2000	47.8000	1210.0000	107.0000
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	-	-	-	-
Methylenebisbenzenamine, 4,4'-	-	-	-	-
Methylenediphenyl Diisocyanate	-	-	-	-
Methylnaphthalene, 1-	910.0000	809.0000	42200.0000	1570.0000
Methylnaphthalene, 2-	52.8000	46.9000	2410.0000	91.2000
Methylstyrene, Alpha-	1410.0000	1180.0000	42200.0000	2430.0000
Metolachlor	21900.0000	9090.0000	90500.0000	37800.0000
Metribuzin	14700.0000	2200.0000	15100.0000	25300.0000
Metsulfuron-methyl	200000.0000	23000.0000	151000.0000	346000.0000
Mineral oils	-	311000.0000	1810000.0000	-
Mirex	-	20.7000	121.0000	-
Molinate	97.6000	66.4000	1210.0000	169.0000
Molybdenum	9770.0000	492.0000	3020.0000	16900.0000
Monoaluminum phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Monoammonium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Monobutyltin Compounds	-	-	-	-
Monocalcium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Monochloramine	195000.0000	9850.0000	60300.0000	338000.0000

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Monomagnesium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Monomethylaniline	558.0000	151.0000	1210.0000	963.0000
Monopotassium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Monosodium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Myclobutanil	3890.0000	1560.0000	15100.0000	6720.0000
N,N'-Diphenyl-1,4-benzenediamine	7.3300	5.9300	181.0000	12.7000
Naled	5610.0000	200.0000	1210.0000	9690.0000
Naphtha, High Flash Aromatic (HFAN)	-	3110.0000	18100.0000	-
Naphthalene	564.0000	443.0000	12100.0000	974.0000
Naphthylamine, 2-	-	-	-	-
Napropamide	8890.0000	5190.0000	72400.0000	15400.0000
Neodymium Chloride (Stable, Nonradioactive)	-	-	-	-
Nickel Acetate	559000.0000	1140.0000	6640.0000	966000.0000
Nickel Carbonate	1100000.0000	1140.0000	6640.0000	1890000.0000
Nickel Carbonyl	-	1140.0000	6640.0000	-
Nickel Hydroxide	860.0000	490.0000	6640.0000	1490.0000
Nickel Oxide	860.0000	490.0000	6640.0000	1490.0000
Nickel Refinery Dust	4300.0000	902.0000	6640.0000	7430.0000
Nickel Soluble Salts	7820.0000	1640.0000	12100.0000	13500.0000
Nickel Subsulfide	4300.0000	902.0000	6640.0000	7430.0000
Nickelocene	-	1140.0000	6640.0000	-
Nitrate (measured as nitrogen)	3130000.0000	158000.0000	965000.0000	5400000.0000
Nitrite (measured as nitrogen)	195000.0000	9850.0000	60300.0000	338000.0000
Nitroaniline, 2-	2710.0000	750.0000	6030.0000	4680.0000
Nitroaniline, 3-	-	-	-	-
Nitroaniline, 4-	2180.0000	349.0000	2410.0000	3770.0000
Nitrobenzene	481.0000	145.0000	1210.0000	830.0000
Nitrocellulose	-	311000000.0000	1810000000.0000	-
Nitrofurantoin	1320000.0000	7220.0000	42200.0000	2280000.0000
Nitrofurazone	-	-	-	-
Nitroglycerin	71.8000	9.0600	60.3000	124.0000
Nitroguanidine	1330000.0000	10300.0000	60300.0000	2290000.0000
Nitromethane	-	-	-	-
Nitrophenol, 2-	-	-	-	-
Nitropropane, 2-	-	-	-	-
Nitropyrene, 4-	-	-	-	-
Nitroso-N-ethylurea, N-	-	-	-	-
Nitroso-N-methylurea, N-	-	-	-	-
Nitroso-di-N-butylamine, N-	-	-	-	-
Nitroso-di-N-propylamine, N-	-	-	-	-
Nitrosodiethanolamine, N-	-	-	-	-
Nitrosodiethylamine, N-	-	-	-	-
Nitrosodimethylamine, N-	49.0000	0.8160	4.8300	84.6000
Nitrosodiphenylamine, N-	-	-	-	-
Nitrosomethylethylamine, N-	-	-	-	-
Nitrosomorpholine [N-]	-	-	-	-
Nitrosopiperidine [N-]	-	-	-	-
Nitrosopyrrolidine, N-	-	-	-	-
Nitrotoluene, m-	10.8000	5.2900	60.3000	18.7000
Nitrotoluene, o-	122.0000	52.9000	543.0000	211.0000
Nitrotoluene, p-	488.0000	224.0000	2410.0000	844.0000
Nonane, n-	-	31.1000	181.0000	-
Norflurazon	6220.0000	1240.0000	9050.0000	10700.0000
OCDD	-	0.2420	1.4100	-
OCDF	-	0.2420	1.4100	-
Octabromodiphenyl Ether	-	311.0000	1810.0000	-
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	524000.0000	5130.0000	30200.0000	905000.0000
Octamethylpyrophosphoramide	117000.0000	207.0000	1210.0000	203000.0000
Octyl Phthalate, di-N-	-	1040.0000	6030.0000	-

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Oryzalin	9580.0000	5770.0000	84500.0000	16500.0000
Oxadiazon	74.3000	65.0000	3020.0000	128.0000
Oxamyl	418000.0000	2580.0000	15100.0000	722000.0000
Oxyfluorfen	551.0000	468.0000	18100.0000	951.0000
Paclobutrazol	1420.0000	692.0000	7840.0000	2460.0000
Paraquat Dichloride	-	467.0000	2710.0000	-
Parathion	246.0000	176.0000	3620.0000	424.0000
PeCDF, 1,2,3,7,8-	-	0.0024	0.0141	-
PeCDF, 2,3,4,7,8-	-	0.0002	0.0014	-
Pebulate	1050.0000	871.0000	30200.0000	1810.0000
Pendimethalin	1460.0000	1390.0000	181000.0000	2520.0000
Pentabromodiphenyl Ether	-	207.0000	1210.0000	-
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	-	10.4000	60.3000	-
Pentachlorobenzene	3.2500	3.1300	483.0000	5.6100
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	-	2.4200	14.1000	-
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	-	2.4200	14.1000	-
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	-	2.4200	14.1000	-
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	-	2.4200	14.1000	-
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	-	0.0007	0.0042	-
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	-	0.0001	0.0004	-
Pentachloroethane	-	-	-	-
Pentachloronitrobenzene	36.6000	32.8000	1810.0000	63.3000
Pentachlorophenol	24.2000	23.1000	3020.0000	41.9000
Pentaerythritol tetranitrate (PETN)	796.0000	165.0000	1210.0000	1370.0000
Pentane, n-	-	-	-	-
Perchlorate and Perchlorate Salts	1370.0000	68.9000	422.0000	2360.0000
Perfluorobutane sulfonic acid (PFBS)	-	2070.0000	12100.0000	-
Perfluorobutanesulfonate	-	2070.0000	12100.0000	-
Perfluorooctane sulfonic acid (PFOS)	-	2.0700	12.1000	-
Perfluorooctanesulfonate	-	2.0700	12.1000	-
Perfluorooctanoic acid (PFOA)	-	2.0700	12.1000	-
Permethrin	-	5180.0000	30200.0000	-
Phenacetin	-	-	-	-
Phenmedipham	15100.0000	9400.0000	145000.0000	26100.0000
Phenol	101000.0000	23800.0000	181000.0000	174000.0000
Phenol, 2-(1-methylethoxy)-, methylcarbamate	2990.0000	364.0000	2410.0000	5170.0000
Phenothiazine	6.2500	5.5800	302.0000	10.8000
Phenyl Isothiocyanate	6.0900	4.7100	121.0000	10.5000
Phenylenediamine, m-	35200.0000	611.0000	3620.0000	60800.0000
Phenylenediamine, o-	11300.0000	400.0000	2410.0000	19500.0000
Phenylenediamine, p-	5610.0000	102.0000	603.0000	9680.0000
Phenylmercuric Acetate	470.0000	8.1500	48.3000	812.0000
Phenylphenol, 2-	-	-	-	-
Phorate	10.2000	6.8200	121.0000	17.5000
Phosgene	-	-	-	-
Phosmet	4360.0000	1410.0000	12100.0000	7530.0000
Phosphine	586.0000	29.5000	181.0000	1010.0000
Phosphoric Acid	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Phosphorus, White	39.1000	1.9700	12.1000	67.5000
Phthalic Acid, P-	270000.0000	74900.0000	603000.0000	467000.0000
Phthalic Anhydride	858000.0000	167000.0000	1210000.0000	1480000.0000
Picloram	35800.0000	6040.0000	42200.0000	61900.0000
Picramic Acid (2-Amino-4,6-dinitrophenol)	172.0000	9.7800	60.3000	298.0000
Picric Acid (2,4,6-Trinitrophenol)	1020.0000	85.5000	543.0000	1760.0000
Pirimiphos, Methyl	1.7900	1.4400	42.2000	3.0900
Polybrominated Biphenyls	-	0.7260	4.2200	-
Polychlorinated Biphenyls (low risk)	-	-	-	-
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	-	-	-	-
Polyphosphoric acid	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Potassium Cyanide	1950.0000	187.0000	1210.0000	3380.0000
Potassium Perchlorate	684.0000	65.6000	422.0000	1180.0000

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Potassium Perfluorobutane Sulfonate	-	2070.0000	12100.0000	-
Potassium Perfluorooctane Sulfonate	-	2.0700	12.1000	-
Potassium Silver Cyanide	195.0000	142.0000	3020.0000	338.0000
Potassium tripolyphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Praseodymium Chloride (Stable, Nonradioactive)	-	-	-	-
Prochloraz	425.0000	292.0000	5430.0000	734.0000
Profluralin	27.4000	26.2000	3620.0000	47.3000
Prometon	1310.0000	711.0000	9050.0000	2260.0000
Prometryn	1940.0000	1320.0000	24100.0000	3350.0000
Pronamide	4520.0000	2860.0000	45200.0000	7810.0000
Propachlor	3580.0000	979.0000	7840.0000	6190.0000
Propanil	367.0000	215.0000	3020.0000	634.0000
Propargite	452.0000	408.0000	24100.0000	781.0000
Propargyl Alcohol	7590.0000	202.0000	1210.0000	13100.0000
Propazine	1970.0000	1010.0000	12100.0000	3400.0000
Propham	2350.0000	1100.0000	12100.0000	4060.0000
Propiconazole	6760.0000	4090.0000	60300.0000	11700.0000
Propionaldehyde	-	-	-	-
Propyl benzene	1500.0000	1310.0000	60300.0000	2580.0000
Propylene	-	-	-	-
Propylene Glycol	214000000.0000	2050000.0000	12100000.0000	369000000.0000
Propylene Glycol Dinitrate	-	-	-	-
Propylene Glycol Monomethyl Ether	4440000.0000	71400.0000	422000.0000	7660000.0000
Propylene Oxide	-	-	-	-
Pyrene	125.0000	120.0000	18100.0000	216.0000
Pyridine	999.0000	93.9000	603.0000	1720.0000
Quinalphos	8.4600	7.2700	302.0000	14.6000
Quinoline	-	-	-	-
Quizalofop-ethyl	315.0000	235.0000	5430.0000	544.0000
Resmethrin	62.7000	61.4000	18100.0000	108.0000
Ronnel	564.0000	509.0000	30200.0000	974.0000
Rotenone	212.0000	140.0000	2410.0000	366.0000
Rubidium	-	-	-	-
Rubidium Chloride	-	-	-	-
Rubidium Hydroxide	-	-	-	-
Rubidium Iodide	-	-	-	-
Safrole	-	-	-	-
Samarium Chloride (Stable, Nonradioactive)	-	-	-	-
Samarium Nitrate (Stable, Nonradioactive)	-	-	-	-
Selenious Acid	9770.0000	492.0000	3020.0000	16900.0000
Selenium	9770.0000	492.0000	3020.0000	16900.0000
Selenium Sulfide	9770.0000	492.0000	3020.0000	16900.0000
Sethoxydim	3140.0000	2580.0000	84500.0000	5420.0000
Silica (crystalline, respirable)	-	-	-	-
Silver	652.0000	289.0000	3020.0000	1130.0000
Silver Cyanide	7820.0000	4460.0000	60300.0000	13500.0000
Simazine	1290.0000	370.0000	3020.0000	2230.0000
Sodium Acifluorfen	173000.0000	1340.0000	7840.0000	299000.0000
Sodium Azide	7820.0000	394.0000	2410.0000	13500.0000
Sodium Cyanide	1950.0000	98.5000	603.0000	3380.0000
Sodium Diethyldithiocarbamate	1590000.0000	3100.0000	18100.0000	2740000.0000
Sodium Fluoride	97700.0000	4920.0000	30200.0000	169000.0000
Sodium Fluoroacetate	-	2.0700	12.1000	-
Sodium Metavanadate	1950.0000	98.5000	603.0000	3380.0000
Sodium Perchlorate	1370.0000	68.9000	422.0000	2360.0000
Sodium Tungstate	1560.0000	78.8000	483.0000	2700.0000
Sodium Tungstate Dihydrate	1560.0000	78.8000	483.0000	2700.0000
Sodium acid pyrophosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium aluminum phosphate (acidic)	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium aluminum phosphate (anhydrous)	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium aluminum phosphate (tetrahydrate)	95000000.0000	4790000.0000	29300000.0000	164000000.0000

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Sodium hexametaphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium polyphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium trimetaphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Sodium tripolyphosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Stirofos (Tetrachlorovinphos)	3160.0000	1570.0000	18100.0000	5470.0000
Strontium, Stable	1170000.0000	59100.0000	362000.0000	2030000.0000
Strychnine	269.0000	27.9000	181.0000	464.0000
Styrene	7880.0000	5710.0000	121000.0000	13600.0000
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	200.0000	122.0000	1810.0000	346.0000
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	200.0000	122.0000	1810.0000	346.0000
Sulfolane	12800.0000	103.0000	603.0000	22100.0000
Sulfonylbis(4-chlorobenzene), 1,1'-	28.9000	21.4000	483.0000	49.9000
Sulfur Mustard	-	-	-	-
Sulfur Trioxide	-	-	-	-
Sulfuric Acid	-	-	-	-
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	679.0000	600.0000	30200.0000	1170.0000
TCDD, 2,3,7,8-	-	0.0001	0.0004	-
TCDF, 2,3,7,8-	-	0.0007	0.0042	-
TCMTB	1970.0000	1210.0000	18100.0000	3410.0000
Tebuthiuron	39000.0000	6120.0000	42200.0000	67400.0000
Temephos	-	2070.0000	12100.0000	-
Terbacil	5770.0000	1090.0000	7840.0000	9960.0000
Terbufos	0.3730	0.3260	15.1000	0.6440
Terbutryn	34.1000	25.7000	603.0000	58.9000
Tert-Butyl Acetate	-	-	-	-
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	-	10.4000	60.3000	-
Tetrachlorobenzene, 1,2,4,5-	1.9700	1.8500	181.0000	3.4000
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	-	0.7260	4.2200	-
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	-	0.2420	1.4100	-
Tetrachloroethane, 1,1,1,2-	1970.0000	1210.0000	18100.0000	3410.0000
Tetrachloroethane, 1,1,2,2-	3010.0000	1230.0000	12100.0000	5200.0000
Tetrachloroethylene	190.0000	146.0000	3620.0000	329.0000
Tetrachlorophenol, 2,3,4,6-	325.0000	294.0000	18100.0000	561.0000
Tetrachlorotoluene, p- alpha, alpha, alpha-	0.5590	0.5130	36.2000	0.9650
Tetraethyl Dithiopyrophosphate	19.7000	14.3000	302.0000	34.0000
Tetraethyl Lead	0.0031	0.0024	0.0603	0.0054
Tetrafluoroethane, 1,1,1,2-	-	-	-	-
Tetrahydrofuran	1110000.0000	86100.0000	543000.0000	1920000.0000
Tetramethylcyclohexane	-	-	-	-
Tetrapotassium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Tetrasodium pyrophosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Tetryl (Trinitrophenylmethylnitramine)	2040.0000	188.0000	1210.0000	3530.0000
Thallic Oxide	39.1000	1.9700	12.1000	67.5000
Thallium (I) Nitrate	19.5000	0.9850	6.0300	33.8000
Thallium (Soluble Salts)	19.5000	0.9850	6.0300	33.8000
Thallium Acetate	141.0000	1.0300	6.0300	244.0000
Thallium Carbonate	39800.0000	2.0700	12.1000	68800.0000
Thallium Chloride	19.5000	0.9850	6.0300	33.8000
Thallium Selenite	19.5000	0.9850	6.0300	33.8000
Thallium Sulfate	39.1000	1.9700	12.1000	67.5000
Thifensulfuron-methyl	95700.0000	4260.0000	25900.0000	165000.0000
Thiobencarb	638.0000	395.0000	6030.0000	1100.0000
Thiocyanates	391.0000	19.7000	121.0000	675.0000
Thiocyanic Acid	391.0000	19.7000	121.0000	675.0000
Thiodiglycol	738000.0000	7190.0000	42200.0000	1270000.0000
Thiofanox	36.1000	16.7000	181.0000	62.4000
Thiophanate, Methyl	57200.0000	2670.0000	16300.0000	98900.0000
Thiram	9920.0000	1340.0000	9050.0000	17100.0000

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Tin	1170000.0000	59100.0000	362000.0000	2030000.0000
Titanium Tetrachloride	-	-	-	-
Toluene	3920.0000	2660.0000	48300.0000	6780.0000
Toluene-2,4-diisocyanate	-	-	-	-
Toluene-2,5-diamine	633.0000	20.1000	121.0000	1090.0000
Toluene-2,6-diisocyanate	-	-	-	-
Toluic Acid, p-	705.0000	299.0000	3020.0000	1220.0000
Toluidine, o- (Methylaniline, 2-)	-	-	-	-
Toluidine, p-	1680.0000	333.0000	2410.0000	2910.0000
Total Petroleum Hydrocarbons (Aliphatic High)	-	311000.0000	1810000.0000	-
Total Petroleum Hydrocarbons (Aliphatic Low)	-	-	-	-
Total Petroleum Hydrocarbons (Aliphatic Medium)	-	1040.0000	6030.0000	-
Total Petroleum Hydrocarbons (Aromatic High)	-	4150.0000	24100.0000	-
Total Petroleum Hydrocarbons (Aromatic Low)	418.0000	208.0000	2410.0000	723.0000
Total Petroleum Hydrocarbons (Aromatic Medium)	73.4000	62.4000	2410.0000	127.0000
Toxaphene	-	9.3300	54.3000	-
Toxaphene, Weathered	-	3.1100	18.1000	-
Tralomethrin	-	778.0000	4520.0000	-
Tri-n-butyltin	8.1600	6.4600	181.0000	14.1000
Triacetin	441000000.0000	8140000.0000	48300000.0000	762000000.0000
Triadimefon	6470.0000	2280.0000	20500.0000	11200.0000
Triallate	344.0000	304.0000	15100.0000	595.0000
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Triasulfuron	49300.0000	1020.0000	6030.0000	85200.0000
Tribenuron-methyl	4120.0000	691.0000	4830.0000	7120.0000
Tribromobenzene, 1,2,4-	66.8000	59.2000	3020.0000	115.0000
Tribromophenol, 2,4,6-	302.0000	228.0000	5430.0000	522.0000
Tributyl Phosphate	270.0000	214.0000	6030.0000	466.0000
Tributyltin Compounds	-	31.1000	181.0000	-
Tributyltin Oxide	78.7000	22.3000	181.0000	136.0000
Tricalcium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Trichloro-1,2,2-trifluoroethane, 1,1,2-	1580000.0000	1050000.0000	18100000.0000	2730000.0000
Trichloro-2'-hydroxydiphenylether	-	-	-	-
Trichloroacetic Acid	14800.0000	1820.0000	12100.0000	25600.0000
Trichloroaniline HCl, 2,4,6-	-	-	-	-
Trichloroaniline, 2,4,6-	0.9660	0.7370	18.1000	1.6700
Trichlorobenzene, 1,2,3-	10.4000	9.2300	483.0000	17.9000
Trichlorobenzene, 1,2,4-	136.0000	120.0000	6030.0000	235.0000
Trichloroethane, 1,1,1-	198000.0000	101000.0000	1210000.0000	342000.0000
Trichloroethane, 1,1,2-	983.0000	292.0000	2410.0000	1700.0000
Trichloroethylene	54.3000	26.5000	302.0000	93.7000
Trichlorofluoromethane	28900.0000	15000.0000	181000.0000	49900.0000
Trichlorophenol, 2,4,5-	2390.0000	1940.0000	60300.0000	4120.0000
Trichlorophenol, 2,4,6-	25.0000	20.1000	603.0000	43.1000
Trichlorophenoxyacetic Acid, 2,4,5-	722.0000	426.0000	6030.0000	1250.0000
Trichlorophenoxypropionic acid, -2,4,5	300.0000	220.0000	4830.0000	518.0000
Trichloropropane, 1,1,2-	602.0000	278.0000	3020.0000	1040.0000
Trichloropropane, 1,2,3-	614.0000	247.0000	2410.0000	1060.0000
Trichloropropene, 1,2,3-	208.0000	125.0000	1810.0000	360.0000
Tricresyl Phosphate (TCP)	215.0000	195.0000	12100.0000	371.0000
Tridiphane	21.3000	19.9000	1810.0000	36.7000
Triethylamine	-	-	-	-
Triethylene Glycol	146000000.0000	207000.0000	1210000.0000	252000000.0000
Trifluoroethane, 1,1,1-	-	-	-	-
Trifluralin	45.7000	43.2000	4520.0000	79.0000
Trimagnesium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Trimethyl Phosphate	126000.0000	1030.0000	6030.0000	217000.0000
Trimethylbenzene, 1,2,3-	156.0000	136.0000	6030.0000	270.0000
Trimethylbenzene, 1,2,4-	163.0000	141.0000	6030.0000	282.0000

Chemical	Dermal SL (Child) THQ=0.1 (ug/L)	Noncarcinogenic SL (Child) THQ=0.1 (ug/L)	Ingestion SL (Adult) THQ=0.1 (ug/L)	Dermal SL (Adult) THQ=0.1 (ug/L)
Trimethylbenzene, 1,3,5-	223.0000	183.0000	6030.0000	385.0000
Trimethylpentene, 2,4,4-	39.5000	38.0000	6030.0000	68.2000
Trinitrobenzene, 1,3,5-	38600.0000	2880.0000	18100.0000	66700.0000
Trinitrotoluene, 2,4,6-	370.0000	45.5000	302.0000	640.0000
Triphenylphosphine Oxide	3140.0000	1250.0000	12100.0000	5420.0000
Tripotassium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Tris(1,3-Dichloro-2-propyl) Phosphate	2680.0000	1170.0000	12100.0000	4630.0000
Tris(1-chloro-2-propyl)phosphate	3110.0000	778.0000	6030.0000	5370.0000
Tris(2,3-dibromopropyl)phosphate	-	-	-	-
Tris(2-chloroethyl)phosphate	9650.0000	675.0000	4220.0000	16700.0000
Tris(2-ethylhexyl)phosphate	-	10400.0000	60300.0000	-
Trisbutoxyethyl Phosphate	-	-	-	-
Trisodium phosphate	95000000.0000	4790000.0000	29300000.0000	164000000.0000
Tungsten	1560.0000	78.8000	483.0000	2700.0000
Uranium	391.0000	19.7000	121.0000	675.0000
Urethane	-	-	-	-
Vanadium Pentoxide	457.0000	307.0000	5430.0000	790.0000
Vanadium and Compounds	256.0000	172.0000	3040.0000	443.0000
Vernolate	20.6000	17.2000	603.0000	35.6000
Vinclozolin	146.0000	67.1000	724.0000	252.0000
Vinyl Acetate	947000.0000	93500.0000	603000.0000	1640000.0000
Vinyl Bromide	-	-	-	-
Vinyl Chloride	575.0000	202.0000	1810.0000	994.0000
Warfarin	69.6000	21.5000	181.0000	120.0000
Xylene, m-	5550.0000	4380.0000	121000.0000	9590.0000
Xylene, o-	6230.0000	4790.0000	121000.0000	10800.0000
Xylene, p-	5970.0000	4640.0000	121000.0000	10300.0000
Xylenes	5890.0000	4590.0000	121000.0000	10200.0000
Zinc Cyanide	163000.0000	5020.0000	30200.0000	281000.0000
Zinc Phosphide	977.0000	30.1000	181.0000	1690.0000
Zinc and Compounds	977000.0000	30100.0000	181000.0000	1690000.0000
Zineb	80200.0000	4870.0000	30200.0000	139000.0000
Zirconium	156.0000	7.8800	48.3000	270.0000

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Site-specific

Recreator Regional Screening Levels

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; ceiling limit exceeded; sat = Csat exceeded.

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Acenaphthene	1290.0000	6.87E+02	nc
Acephate	713.0000	1.24E+02	nc
Acetaldehyde	-		
Acetochlor	3120.0000	1.12E+03	nc
Acetone	488000.0000	9.03E+04	nc
Acetone Cyanohydrin	-		
Acetonitrile	-		
Acetophenone	30300.0000	8.02E+03	nc
Acetylaminofluorene, 2-	-	5.40E-01	ca
Acrolein	260.0000	4.95E+01	nc
Acrylamide	1150.0000	3.61E+00	ca*
Acrylic Acid	244000.0000	4.84E+04	nc
Acrylonitrile	19300.0000	1.25E+01	ca
Adiponitrile	-		
Alachlor	851.0000	3.14E+01	ca*
Aldicarb	467.0000	9.54E+01	nc
Aldicarb Sulfone	593.0000	1.03E+02	nc
Aldrin	18.1000	4.52E-01	ca**
Allyl Alcohol	2490.0000	4.88E+02	nc
Allyl Chloride	-	1.53E+02	ca
Aluminum	512000.0000	9.85E+04	nc
Aluminum Phosphide	205.0000	3.94E+01	nc
Aluminum metaphosphate	24900000.0000	4.79E+06	nc
Ametryn	1110.0000	4.33E+02	nc
Aminobiphenyl, 4-	-	1.01E-01	ca
Aminophenol, m-	42500.0000	7.98E+03	nc
Aminophenol, o-	1930.0000	3.86E+02	nc
Aminophenol, p-	10900.0000	2.01E+03	nc
Amitraz	13.8000	7.83E+00	nc
Ammonium Perchlorate	358.0000	6.89E+01	nc
Ammonium Sulfamate	102000.0000	1.97E+04	nc
Ammonium polyphosphate	24900000.0000	4.79E+06	nc
Amyl Alcohol, tert-	-		
Aniline	2920.0000	6.41E+02	nc
Anthracene	3500.0000	1.94E+03	nc
Anthraquinone, 9,10-	143.0000	3.77E+01	ca**
Antimony (metallic)	110.0000	3.06E+01	nc
Antimony Pentoxide	138.0000	3.83E+01	nc
Antimony Potassium Tartrate	-		
Antimony Tetroxide	110.0000	3.06E+01	nc
Antimony Trichloride	-		
Antimony Trioxide	-		
Aroclor 1016	42.2000	7.26E+00	nc
Aroclor 1221	-	1.05E-01	ca
Aroclor 1232	-	1.05E-01	ca
Aroclor 1242	-	3.85E+00	ca
Aroclor 1248	-	3.85E+00	ca
Aroclor 1254	12.1000	2.07E+00	nc
Aroclor 1260	-	3.85E+00	ca
Aroclor 5460	362.0000	6.22E+01	nc
Arsenic, Inorganic	154.0000	4.67E+00	ca**
Arsine	1.7900	3.45E-01	nc
Asulam	21200.0000	3.70E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Atrazine	6240.0000	1.44E+01	ca
Auramine	-	3.49E+00	ca
Avermectin B1	241.0000	4.15E+01	nc
Azinphos-methyl	715.0000	2.14E+02	nc
Azobenzene	-	6.12E+00	ca
Azodicarbonamide	599000.0000	1.03E+05	nc
Barium	34000.0000	1.18E+04	nc
Benfluralin	55.8000	3.09E+01	nc
Benomyl	17800.0000	4.30E+03	nc
Bensulfuron-methyl	89400.0000	1.88E+04	nc
Bentazon	7720.0000	2.22E+03	nc
Benz[a]anthracene	-	1.84E+01	ca
Benzaldehyde	30800.0000	1.26E+03	ca**
Benzene	556.0000	4.91E+01	ca**
Benzenediamine-2-methyl sulfate, 1,4-	181.0000	3.11E+01	nc
Benzenethiol	111.0000	4.47E+01	nc
Benzidine	1270.0000	6.83E-03	ca
Benzo(j)fluoranthene	-	6.41E+00	ca
Benzo[a]pyrene	181.0000	1.84E+00	ca*
Benzo[b]fluoranthene	-	1.84E+01	ca
Benzo[k]fluoranthene	-	1.84E+02	ca
Benzoic Acid	961000.0000	2.86E+05	nc
Benzotrichloride	-	5.03E-02	ca
Benzyl Alcohol	39400.0000	8.96E+03	nc
Benzyl Chloride	318.0000	1.78E+01	ca**
Beryllium and compounds	45.5000	2.42E+01	nc
Bifenox	309.0000	1.58E+02	nc
Biphenthrin	9050.0000	1.56E+03	nc
Biphenyl, 1,1'-	9790.0000	5.50E+01	ca*
Bis(2-chloro-1-methylethyl) ether	6690.0000	2.34E+03	nc
Bis(2-chloroethoxy)methane	1270.0000	2.76E+02	nc
Bis(2-chloroethyl)ether	-	5.41E+00	ca
Bis(2-ethylhexyl)phthalate	12100.0000	5.49E+02	ca**
Bis(chloromethyl)ether	-	3.11E-02	ca
Bisphenol A	4020.0000	1.77E+03	nc
Boron And Borates Only	102000.0000	1.97E+04	nc
Boron Trichloride	1020000.0000	1.97E+05	nc
Boron Trifluoride	20500.0000	3.94E+03	nc
Bromate	2050.0000	1.00E+01	ca*
Bromo-2-chloroethane, 1-	-	2.18E+00	ca
Bromo-3-fluorobenzene, 1-	30.3000	1.26E+01	nc
Bromo-4-fluorobenzene, 1-	24.6000	1.08E+01	nc
Bromobenzene	654.0000	2.87E+02	nc
Bromochloromethane	-		
Bromodichloromethane	5230.0000	7.20E+01	ca*
Bromoform	5120.0000	5.56E+02	ca**
Bromomethane	501.0000	1.21E+02	nc
Bromophos	76.4000	4.18E+01	nc
Bromopropane, 1-	-		
Bromoxynil	1570.0000	2.06E+01	ca*
Bromoxynil Octanoate	218.0000	3.20E+00	ca*
Butadiene, 1,3-	-	4.41E+00	ca
Butanoic acid, 4-(2,4-dichlorophenoxy)-	2250.0000	1.00E+03	nc
Butanol, N-	39600.0000	8.97E+03	nc
Butyl Benzyl Phthalate	3970.0000	2.35E+02	ca**
Butyl Formate, tert-	-		
Butyl alcohol, sec-	896000.0000	1.88E+05	nc
Butylate	1170.0000	6.18E+02	nc
Butylated hydroxyanisole	-	2.18E+03	ca
Butylated hydroxytoluene	1710.0000	3.63E+01	ca*
Butylbenzene, n-	30200.0000	5.18E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Butylbenzene, sec-	60300.0000	1.04E+04	nc
Butylbenzene, tert-	1470.0000	8.04E+02	nc
Butylphthalyl Butylglycolate	53200.0000	2.55E+04	nc
Cacodylic Acid	10600.0000	1.99E+03	nc
Cadmium (Water)	66.0000	2.52E+01	nc
Calcium Cyanide	512.0000	9.85E+01	nc
Calcium pyrophosphate	24900000.0000	4.79E+06	nc
Caprolactam	240000.0000	4.81E+04	nc
Captafol	183.0000	1.25E+01	ca**
Captan	27600.0000	1.66E+03	ca**
Carbaryl	21700.0000	6.78E+03	nc
Carbofuran	1220.0000	3.61E+02	nc
Carbon Disulfide	17000.0000	5.90E+03	nc
Carbon Tetrachloride	396.0000	2.88E+01	ca**
Carbonyl Sulfide	-		
Carbosulfan	97.3000	5.43E+01	nc
Carboxin	29800.0000	7.96E+03	nc
Ceric oxide	-		
Chloral	-		
Chloral Hydrate	47300.0000	9.58E+03	nc
Chloramben	4870.0000	1.24E+03	nc
Chloranil	-	1.20E+01	ca
Chlordane (technical mixture)	2.5100	3.29E-01	ca**
Chlordecone (Kepone)	7.4300	5.53E-02	ca*
Chlorfenvinphos	67.0000	2.82E+01	nc
Chlorimuron, Ethyl-	34900.0000	8.01E+03	nc
Chlorine	51200.0000	9.85E+03	nc
Chlorine Dioxide	15400.0000	2.95E+03	nc
Chlorite (Sodium Salt)	15400.0000	2.95E+03	nc
Chloro-1,1-difluoroethane, 1-	-		
Chloro-1,3-butadiene, 2-	1880.0000	7.93E+02	nc
Chloro-2-methylaniline HCl, 4-	-	1.67E+01	ca
Chloro-2-methylaniline, 4-	537.0000	3.33E+01	ca**
Chloroacetaldehyde, 2-	-	2.63E+01	ca
Chloroacetophenone, 2-	-		
Chloroaniline, p-	1020.0000	2.19E+01	ca*
Chlorobenzene	1500.0000	6.71E+02	nc
Chlorobenzene sulfonic acid, p-	59000.0000	1.03E+04	nc
Chlorobenzilate	475.0000	4.82E+00	ca*
Chlorobenzoic Acid, p-	3750.0000	1.46E+03	nc
Chlorobenzotrifluoride, 3-nitro-4-	-		
Chlorobenzotrifluoride, 4-	124.0000	6.17E+01	nc
Chlorobutane, 1-	3350.0000	1.46E+03	nc
Chlorodifluoromethane	-		
Chloroethanol, 2-	10600.0000	1.99E+03	nc
Chloroform	2150.0000	1.24E+02	ca**
Chloromethane	-		
Chloromethyl Methyl Ether	-	2.87E+00	ca
Chloronaphthalene, Beta-	1920.0000	1.01E+03	nc
Chloronitrobenzene, o-	599.0000	1.21E+01	ca*
Chloronitrobenzene, p-	119.0000	4.14E+01	nc
Chlorophenol, 2-	944.0000	3.14E+02	nc
Chloropicrin	-		
Chlorothalonil	2240.0000	1.69E+02	ca**
Chlorotoluene, o-	754.0000	3.80E+02	nc
Chlorotoluene, p-	855.0000	4.24E+02	nc
Chlorozotocin	-	3.19E-02	ca
Chlorpropham	3140.0000	1.46E+03	nc
Chlorpyrifos	20.1000	1.08E+01	nc
Chlorpyrifos Methyl	389.0000	1.95E+02	nc
Chlorsulfuron	22000.0000	4.67E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Chlorthal-dimethyl	431.0000	2.13E+02	nc
Chlorthiophos	4.8500	2.74E+00	nc
Chromium(III), Insoluble Salts	61400.0000	3.06E+04	nc
Chromium(VI)	118.0000	5.31E-01	ca
Chrysene	-	1.84E+03	ca
Clofentezine	2190.0000	7.64E+02	nc
Cobalt	169.0000	3.05E+01	nc
Copper	20500.0000	3.94E+03	nc
Copper Cyanide	2560.0000	4.92E+02	nc
Cresol, m-	10200.0000	3.28E+03	nc
Cresol, o-	10300.0000	3.30E+03	nc
Cresol, p-	20800.0000	6.63E+03	nc
Cresol, p-chloro-m-	6480.0000	2.99E+03	nc
Cresols	8240.0000	3.60E+03	nc
Crotonaldehyde, trans-	445.0000	3.38E+00	ca*
Cumene	2580.0000	1.36E+03	nc
Cupferron	-	3.49E+01	ca
Cyanazine	570.0000	5.66E+00	ca*
Cyanide (CN-)	307.0000	5.91E+01	nc
Cyanogen	521.0000	9.90E+01	nc
Cyanogen Bromide	51900.0000	9.21E+03	nc
Cyanogen Chloride	28200.0000	5.08E+03	nc
Cyclohexane	-		
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	1360.0000	7.18E+01	ca**
Cyclohexanone	2200000.0000	4.67E+05	nc
Cyclohexene	291.0000	1.37E+02	nc
Cyclohexylamine	59200.0000	1.59E+04	nc
Cyclopentadiene	-		
Cyfluthrin	221.0000	1.24E+02	nc
Cyhalothrin	603.0000	1.04E+02	nc
Cyromazine	239000.0000	4.81E+04	nc
DDD, p,p`- (DDD)	0.1010	5.75E-02	nc
DDE, p,p'-	181.0000	2.26E+01	ca**
DDT	302.0000	2.26E+01	ca**
Dalapon	14600.0000	2.90E+03	nc
Daminozide	89900.0000	4.26E+02	ca*
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	4220.0000	7.26E+02	nc
Decane	-		
Demeton	1.2000	6.20E-01	nc
Di(2-ethylhexyl)adipate	362000.0000	6.41E+03	ca**
Diallate	-	7.98E+00	ca
Diammonium phosphate	24900000.0000	4.79E+06	nc
Diazinon	49.4000	2.24E+01	nc
Dibenz[a,h]anthracene	-	1.84E+00	ca
Dibenzo(a,e)pyrene	-	6.41E-01	ca
Dibenzofuran	17.9000	9.70E+00	nc
Dibenzothiophene	135.0000	7.40E+01	nc
Dibromo-3-chloropropane, 1,2-	26.5000	9.29E-01	ca*
Dibromobenzene, 1,3-	20.5000	9.88E+00	nc
Dibromobenzene, 1,4-	486.0000	2.36E+02	nc
Dibromochloromethane	5350.0000	5.41E+01	ca*
Dibromoethane, 1,2-	2640.0000	2.43E+00	ca
Dibromomethane (Methylene Bromide)	-		
Dibutyl Phthalate	2260.0000	1.20E+03	nc
Dibutyltin Compounds	181.0000	3.11E+01	nc
Dibutyltin dichloride	-		
Dicalcium phosphate	24900000.0000	4.79E+06	nc
Dicamba	8050.0000	2.27E+03	nc
Dichloro-2-butene, 1,4-	-		

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Dichloro-2-butene, cis-1,4-	-		
Dichloro-2-butene, trans-1,4-	-		
Dichloroacetic Acid	1810.0000	1.30E+02	ca**
Dichlorobenzene, 1,2-	3800.0000	1.89E+03	nc
Dichlorobenzene, 1,3-	-		
Dichlorobenzene, 1,4-	2910.0000	1.68E+02	ca**
Dichlorobenzidine, 3,3'-	-	3.35E+00	ca
Dichlorobenzophenone, 4,4'-	188.0000	1.01E+02	nc
Dichlorobenzotrifluoride, 3,4-	-		
Dichlorodifluoromethane	35800.0000	1.22E+04	nc
Dichlorodiisopropyl ether, 2,2'-	-		
Dichloroethane, 1,1-	45700.0000	7.07E+02	ca*
Dichloroethane, 1,2-	1790.0000	5.39E+01	ca**
Dichloroethylene, 1,1-	7930.0000	2.83E+03	nc
Dichloroethylene, 1,2-cis-	332.0000	1.16E+02	nc
Dichloroethylene, 1,2-trans-	3320.0000	1.16E+03	nc
Dichlorophenol, 2,4-	236.0000	1.04E+02	nc
Dichlorophenoxy Acetic Acid, 2,4-	1460.0000	5.38E+02	nc
Dichloropropane, 1,2-	8230.0000	1.01E+02	ca*
Dichloropropane, 1,3-	4040.0000	1.30E+03	nc
Dichloropropanol, 2,3-	1420.0000	2.88E+02	nc
Dichloropropene, 1,3-	5800.0000	3.54E+01	ca*
Dichlorvos	219.0000	2.19E+01	ca**
Dicrotophos	17.4000	3.08E+00	nc
Dicyclopentadiene	4450.0000	2.11E+03	nc
Dieldrin	0.8520	2.40E-02	ca*
Diethanolamine	1190.0000	2.07E+02	nc
Diethyl Phthalate	178000.0000	5.50E+04	nc
Diethyl-meta-Toluamide, N,N (DEET)	-		
Diethylene Glycol Monobutyl Ether	15800.0000	2.98E+03	nc
Diethylene Glycol Monoethyl Ether	35000.0000	6.16E+03	nc
Diethylformamide	542.0000	1.00E+02	nc
Diethylstilbestrol	-	5.90E-04	ca
Difenzoquat	47800.0000	8.49E+03	nc
Diflubenzuron	1330.0000	6.10E+02	nc
Difluoroethane, 1,1-	-		
Difluoropropane, 2,2-	-		
Dihydrosafrole	-	1.91E+01	ca
Diisopropyl Ether	-		
Diisopropyl Methylphosphonate	38100.0000	7.69E+03	nc
Dimagnesium phosphate	24900000.0000	4.79E+06	nc
Dimethipin	12700.0000	2.24E+03	nc
Dimethoate	1170.0000	2.19E+02	nc
Dimethoxybenzidine, 3,3'-	-	3.64E+00	ca
Dimethyl methylphosphonate	35000.0000	4.44E+03	ca**
Dimethylamino azobenzene [p-]	-	6.37E-02	ca
Dimethylaniline HCl, 2,4-	-	1.32E+01	ca
Dimethylaniline, 2,4-	563.0000	2.36E+01	ca**
Dimethylaniline, N,N-	305.0000	1.08E+02	ca**
Dimethylbenz(a)anthracene, 7,12-	-	7.38E-03	ca
Dimethylbenzidine, 3,3'-	-	3.70E-01	ca
Dimethylformamide	58600.0000	1.03E+04	nc
Dimethylhydrazine, 1,1-	58.8000	1.03E+01	nc
Dimethylhydrazine, 1,2-	-	1.35E-02	ca
Dimethylphenol, 2,4-	3100.0000	1.12E+03	nc
Dimethylphenol, 2,6-	86.5000	3.20E+01	nc
Dimethylphenol, 3,4-	167.0000	5.84E+01	nc
Dimethylphthalate	-		
Dimethylterephthalate	23400.0000	7.06E+03	nc
Dimethylvinylchloride	-	4.06E+01	ca
Dinitro-o-cresol, 4,6-	21.2000	6.01E+00	nc

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Dinitro-o-cyclohexyl Phenol, 4,6-	72.7000	3.68E+01	nc
Dinitrobenzene, 1,2-	33.6000	8.39E+00	nc
Dinitrobenzene, 1,3-	38.1000	8.84E+00	nc
Dinitrobenzene, 1,4-	38.7000	8.89E+00	nc
Dinitrophenol, 2,4-	712.0000	1.72E+02	nc
Dinitrotoluene Mixture, 2,4/2,6-	-	6.14E+00	ca
Dinitrotoluene, 2,4-	567.0000	1.53E+01	ca*
Dinitrotoluene, 2,6-	76.8000	2.93E+00	ca**
Dinitrotoluene, 2-Amino-4,6-	33.1000	8.33E+00	nc
Dinitrotoluene, 4-Amino-2,6-	33.1000	8.33E+00	nc
Dinitrotoluene, Technical grade	39.4000	2.12E+00	ca**
Dinoseb	68.4000	3.12E+01	nc
Dioxane, 1,4-	16800.0000	7.37E+01	ca*
Diphenamid	4540.0000	1.65E+03	nc
Diphenyl Ether	-		
Diphenyl Sulfone	179.0000	5.52E+01	nc
Diphenylamine	4440.0000	2.19E+03	nc
Diphenylhydrazine, 1,2-	-	2.62E+00	ca
Dipotassium phosphate	24900000.0000	4.79E+06	nc
Diquat	1330.0000	2.28E+02	nc
Direct Black 38	-	1.04E+00	ca
Direct Blue 6	-	1.04E+00	ca
Direct Brown 95	-	1.15E+00	ca
Disodium phosphate	24900000.0000	4.79E+06	nc
Disulfoton	1.7600	8.71E-01	nc
Dithiane, 1,4-	4680.0000	9.55E+02	nc
Diundecyl Phthalate	-		
Diuron	358.0000	1.22E+02	nc
Dodine	10400.0000	1.98E+03	nc
EPTC	3740.0000	1.67E+03	nc
Endosulfan	721.0000	2.84E+02	nc
Endosulfan Sulfate	956.0000	3.40E+02	nc
Endothall	6070.0000	1.60E+03	nc
Endrin	5.1100	2.77E+00	nc
Epichlorohydrin	2950.0000	5.83E+02	nc
Epoxybutane, 1,2-	-		
Ethanol, 2-(2-methoxyethoxy)-	23800.0000	4.13E+03	nc
Ethephon	2870.0000	5.11E+02	nc
Ethion	10.6000	5.65E+00	nc
Ethoxyethanol Acetate, 2-	50400.0000	9.80E+03	nc
Ethoxyethanol, 2-	50700.0000	9.14E+03	nc
Ethyl Acetate	399000.0000	8.43E+04	nc
Ethyl Acrylate	1680.0000	4.19E+02	nc
Ethyl Chloride	-		
Ethyl Ether	78700.0000	1.79E+04	nc
Ethyl Methacrylate	-		
Ethyl-p-nitrophenyl Phosphonate	0.2210	1.18E-01	nc
Ethylbenzene	4750.0000	9.36E+01	ca*
Ethylene Cyanohydrin	40900.0000	7.19E+03	nc
Ethylene Diamine	54300.0000	9.33E+03	nc
Ethylene Glycol	1180000.0000	2.06E+05	nc
Ethylene Glycol Monobutyl Ether	45700.0000	9.47E+03	nc
Ethylene Oxide	-	5.67E+00	ca
Ethylene Thiourea	46.5000	8.20E+00	nc
Ethyleneimine	-	1.11E-01	ca
Ethylphthalyl Ethyl Glycolate	994000.0000	2.50E+05	nc
Fenamiphos	36.4000	1.34E+01	nc
Fenpropathrin	104.0000	5.93E+01	nc
Fenvalerate	15100.0000	2.59E+03	nc
Fluometuron	3020.0000	9.14E+02	nc
Fluoranthene	24100.0000	4.15E+03	nc

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Fluorene	646.0000	3.52E+02	nc
Fluoride	20500.0000	3.94E+03	nc
Fluorine (Soluble Fluoride)	30700.0000	5.91E+03	nc
Fluorobenzene	-		
Fluridone	14300.0000	4.86E+03	nc
Flurprimidol	5360.0000	2.03E+03	nc
Flusilazole	173.0000	7.48E+01	nc
Flutolanil	45300.0000	1.93E+04	nc
Fluvalinate	6030.0000	1.04E+03	nc
Folpet	17900.0000	5.81E+03	nc
Fomesafen	804.0000	2.06E+02	nc
Fonofos	83.4000	4.15E+01	nc
Formaldehyde	87800.0000	3.03E+02	ca*
Formic Acid	503000.0000	9.11E+04	nc
Fosetyl-AL	1510000.0000	2.59E+05	nc
Furan	285.0000	7.78E+01	nc
Furazolidone	-	1.98E+00	ca
Furfural	1500.0000	2.93E+02	nc
Furium	-	3.95E+00	ca
Furmecyclox	-	1.69E+01	ca
Gadolinium	-		
Glufosinate, Ammonium	3620.0000	6.22E+02	nc
Glutaraldehyde	55900.0000	1.01E+04	nc
Glycidyl	216.0000	4.01E+01	nc
Glyphosate	60300.0000	1.04E+04	nc
Guanidine	5950.0000	1.03E+03	nc
Guanidine Chloride	12100.0000	2.07E+03	nc
Guanidine Nitrate	18100.0000	3.11E+03	nc
Haloxyfop, Methyl	3.8200	1.70E+00	nc
Heptachlor	2.0800	2.12E-02	ca*
Heptachlor Epoxide	0.3230	6.09E-02	ca**
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	14.1000	1.97E+00	ca**
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	0.0422	5.92E-03	ca**
Heptanal, n-	-		
Heptane, N-	181.0000	3.11E+01	nc
Hexabromobenzene	1210.0000	2.07E+02	nc
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	121.0000	2.07E+01	nc
Hexachlorobenzene	483.0000	4.81E+00	ca*
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	14.1000	1.97E+00	ca**
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	14.1000	1.97E+00	ca**
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	14.1000	1.97E+00	ca**
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	0.0141	1.97E-03	ca**
Hexachlorobutadiene	13.3000	3.86E+00	ca**
Hexachlorocyclohexane, Alpha-	329.0000	1.42E-01	ca
Hexachlorocyclohexane, Beta-	-	4.99E-01	ca
Hexachlorocyclohexane, Gamma- (Lindane)	12.3000	8.16E-01	ca**
Hexachlorocyclohexane, Technical	-	4.99E-01	ca
Hexachlorocyclopentadiene	58.5000	3.26E+01	nc
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	0.0042	5.92E-04	ca**
Hexachlorodibenzo-p-dioxin, Mixture	-	1.24E-03	ca
Hexachlorodibenzofuran, 1,2,3,4,7,8-	0.0042	5.92E-04	ca**
Hexachloroethane	18.7000	9.78E+00	nc
Hexachlorophene	181.0000	3.11E+01	nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2080.0000	8.84E+01	ca**
Hexamethylene Diisocyanate, 1,6-	-		
Hexamethylene diisocyanate biuret	-		
Hexamethylene diisocyanate isocyanurate	-		
Hexamethylphosphoramide	222.0000	4.05E+01	nc
Hexane, Commercial	-		
Hexane, N-	-		
Hexanedioic Acid	1120000.0000	2.03E+05	nc

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Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	6810.0000	2.09E+02	ca*
Hexanone, 2-	1610.0000	4.12E+02	nc
Hexazinone	12500.0000	2.91E+03	nc
Hexythiazox	204.0000	1.14E+02	nc
HpCDD, 1,2,3,4,6,7,8,-	0.0422	5.92E-03	ca**
HpCDF, 1,2,3,4,7,8,9-	0.0422	5.92E-03	ca**
HxCDD, 1,2,3,6,7,8-	0.0042	5.92E-04	ca**
HxCDD, 1,2,3,7,8,9-	0.0042	5.92E-04	ca**
HxCDF, 1,2,3,6,7,8-	0.0042	5.92E-04	ca**
HxCDF, 1,2,3,7,8,9-	0.0042	5.92E-04	ca**
HxCDF, 2,3,4,6,7,8-	0.0042	5.92E-04	ca**
Hydramethylnon	8220.0000	1.64E+03	nc
Hydrazine	-	2.55E+00	ca
Hydrazine Sulfate	-	2.33E+00	ca
Hydrogen Chloride	-		
Hydrogen Cyanide	307.0000	5.91E+01	nc
Hydrogen Fluoride	20500.0000	3.94E+03	nc
Hydrogen Sulfide	-		
Hydroquinone	19500.0000	1.13E+02	ca*
Imazalil	167.0000	2.31E+01	ca**
Imazaquin	107000.0000	2.31E+04	nc
Imazethapyr	612000.0000	1.81E+05	nc
Indeno[1,2,3-cd]pyrene	-	1.84E+01	ca
Iodine	5120.0000	9.85E+02	nc
Iprodione	8440.0000	2.67E+03	nc
Iron	358000.0000	6.89E+04	nc
Isobutyl Alcohol	126000.0000	2.75E+04	nc
Isophorone	59600.0000	5.17E+03	ca**
Isopropalin	65.2000	3.71E+01	nc
Isopropanol	1030000.0000	1.97E+05	nc
Isopropyl Methyl Phosphonic Acid	54100.0000	1.00E+04	nc
Isoxaben	3460.0000	1.58E+03	nc
JP-4	-		
JP-5	-		
JP-7	-		
JP-8	-		
Kerosene	-		
Lactofen	354.0000	1.75E+02	nc
Lactonitrile	117.0000	2.05E+01	nc
Lanthanum	25.6000	4.92E+00	nc
Lanthanum Acetate Hydrate	12.5000	2.16E+00	nc
Lanthanum Chloride Heptahydrate	9.5700	1.84E+00	nc
Lanthanum Chloride, Anhydrous	14.5000	2.79E+00	nc
Lanthanum Nitrate Hexahydrate	8.1900	1.58E+00	nc
Lead Phosphate	-	8.23E+02	ca
Lead acetate	-	3.62E+01	ca
Lead subacetate	-	2.02E+02	ca
Lewisite	0.9070	3.07E-01	nc
Linuron	883.0000	3.53E+02	nc
Lithium	1020.0000	1.97E+02	nc
Lithium Perchlorate	358.0000	6.89E+01	nc
Lutetium	-		
MCPA	37.8000	1.69E+01	nc
MCPB	305.0000	1.39E+02	nc
MCPP	87.2000	3.76E+01	nc
Malathion	6800.0000	1.69E+03	nc
Maleic Anhydride	26500.0000	7.52E+03	nc
Maleic Hydrazide	294000.0000	5.14E+04	nc
Malononitrile	57.0000	1.02E+01	nc
Mancozeb	5070.0000	1.76E+03	nc
Maneb	1900.0000	4.42E+02	nc

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Manganese (Non-diet)	2650.0000	1.07E+03	nc
Mephosfolan	47.1000	8.93E+00	nc
Mepiquat Chloride	18100.0000	3.11E+03	nc
Mercaptobenzothiazole, 2-	702.0000	2.41E+02	nc
Mercuric Chloride	51.0000	1.77E+01	nc
Mercury (elemental)	-		
Merphos	18.1000	3.11E+00	nc
Merphos Oxide	0.4690	2.66E-01	nc
Metalaxyl	25900.0000	5.56E+03	nc
Methacrylonitrile	42.7000	9.23E+00	nc
Methamidophos	29.5000	5.15E+00	nc
Methanol	1130000.0000	2.03E+05	nc
Methidathion	524.0000	1.28E+02	nc
Methomyl	13100.0000	2.48E+03	nc
Methoxy-5-nitroaniline, 2-	-	1.20E+02	ca
Methoxychlor	81.5000	4.44E+01	nc
Methoxyethanol Acetate, 2-	4370.0000	8.05E+02	nc
Methoxyethanol, 2-	2900.0000	5.12E+02	nc
Methyl Acetate	511000.0000	9.84E+04	nc
Methyl Acrylate	-		
Methyl Ethyl Ketone (2-Butanone)	297000.0000	5.84E+04	nc
Methyl Hydrazine	582.0000	1.03E+02	nc
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	-		
Methyl Isocyanate	-		
Methyl Mercury	51.2000	9.85E+00	nc
Methyl Methacrylate	451000.0000	1.15E+05	nc
Methyl Parathion	42.2000	1.47E+01	nc
Methyl Phosphonic Acid	35400.0000	6.18E+03	nc
Methyl Styrene (Mixed Isomers)	60.5000	3.37E+01	nc
Methyl methanesulfonate	-	7.62E+01	ca
Methyl tert-Butyl Ether (MTBE)	-	3.35E+03	ca
Methyl-1,4-benzenediamine dihydrochloride, 2-	181.0000	3.11E+01	nc
Methyl-2-Pentanol, 4-	-		
Methyl-5-Nitroaniline, 2-	5490.0000	5.14E+02	ca**
Methyl-N-nitro-N-nitrosoguanidine, N-	-	9.18E-01	ca
Methylaniline Hydrochloride, 2-	-	5.91E+01	ca
Methylarsonic acid	5960.0000	1.03E+03	nc
Methylbenzene,1-4-diamine monohydrochloride, 2-	121.0000	2.07E+01	nc
Methylbenzene-1,4-diamine sulfate, 2-	181.0000	3.11E+01	nc
Methylcholanthrene, 3-	-	8.38E-02	ca
Methylcyclopentane	-		
Methylene Chloride	1980.0000	5.00E+02	nc
Methylene-bis(2-chloroaniline), 4,4'-	98.6000	3.25E+00	ca*
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	-	1.03E+01	ca
Methylenebisbenzenamine, 4,4'-	-	3.67E+00	ca
Methylenediphenyl Diisocyanate	-		
Methylnaphthalene, 1-	1520.0000	1.67E+01	ca*
Methylnaphthalene, 2-	87.9000	4.69E+01	nc
Methylstyrene, Alpha-	2300.0000	1.18E+03	nc
Metolachlor	26700.0000	9.09E+03	nc
Metribuzin	9460.0000	2.20E+03	nc
Metsulfuron-methyl	105000.0000	2.30E+04	nc
Mineral oils	1810000.0000	3.11E+05	nc
Mirex	121.0000	4.27E-01	ca*
Molinate	148.0000	6.64E+01	nc
Molybdenum	2560.0000	4.92E+02	nc
Monoaluminum phosphate	24900000.0000	4.79E+06	nc
Monoammonium phosphate	24900000.0000	4.79E+06	nc
Monobutyltin Compounds	-		
Monocalcium phosphate	24900000.0000	4.79E+06	nc
Monochloramine	51200.0000	9.85E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Monomagnesium phosphate	24900000.0000	4.79E+06	nc
Monomethylaniline	536.0000	1.51E+02	nc
Monopotassium phosphate	24900000.0000	4.79E+06	nc
Monosodium phosphate	24900000.0000	4.79E+06	nc
Myclobutanil	4650.0000	1.56E+03	nc
N,N'-Diphenyl-1,4-benzenediamine	11.8000	5.93E+00	nc
Naled	1070.0000	2.00E+02	nc
Naphtha, High Flash Aromatic (HFAN)	18100.0000	3.11E+03	nc
Naphthalene	901.0000	8.16E+00	ca*
Naphthylamine, 2-	-	1.84E+00	ca
Napropamide	12700.0000	5.19E+03	nc
Neodymium Chloride (Stable, Nonradioactive)	-		
Nickel Acetate	6590.0000	8.42E+00	ca
Nickel Carbonate	6610.0000	8.44E+00	ca
Nickel Carbonyl	6640.0000	8.45E+00	ca
Nickel Hydroxide	1210.0000	2.44E+00	ca
Nickel Oxide	1210.0000	2.44E+00	ca
Nickel Refinery Dust	3510.0000	5.66E+00	ca
Nickel Soluble Salts	6370.0000	1.64E+03	nc
Nickel Subsulfide	3510.0000	3.03E+00	ca
Nickelocene	6640.0000	8.45E+00	ca
Nitrate (measured as nitrogen)	819000.0000	1.58E+05	nc
Nitrite (measured as nitrogen)	51200.0000	9.85E+03	nc
Nitroaniline, 2-	2640.0000	7.50E+02	nc
Nitroaniline, 3-	-		
Nitroaniline, 4-	1470.0000	2.84E+02	ca**
Nitrobenzene	492.0000	1.45E+02	nc
Nitrocellulose	1810000000.0000	3.11E+08	nc
Nitrofurantoin	41500.0000	7.22E+03	nc
Nitrofurazone	-	5.70E+00	ca
Nitroglycerin	40.6000	9.06E+00	nc
Nitroguanidine	58800.0000	1.03E+04	nc
Nitromethane	-		
Nitrophenol, 2-	-		
Nitropropane, 2-	-		
Nitropyrene, 4-	-	2.38E-01	ca
Nitroso-N-ethylurea, N-	-	6.48E-02	ca
Nitroso-N-methylurea, N-	-	1.48E-02	ca
Nitroso-di-N-butylamine, N-	-	4.73E-01	ca
Nitroso-di-N-propylamine, N-	-	8.09E-01	ca
Nitrosodiethanolamine, N-	-	2.73E+00	ca
Nitrosodiethylamine, N-	-	1.13E-02	ca
Nitrosodimethylamine, N-	4.5700	3.53E-02	ca*
Nitrosodiphenylamine, N-	-	3.69E+02	ca
Nitrosomethylethylamine, N-	-	3.27E-01	ca
Nitrosomorpholine [N-]	-	1.12E+00	ca
Nitrosopiperidine [N-]	-	7.51E-01	ca
Nitrosopyrrolidine, N-	-	3.51E+00	ca
Nitrotoluene, m-	14.3000	5.29E+00	nc
Nitrotoluene, o-	152.0000	1.44E+01	ca**
Nitrotoluene, p-	625.0000	1.86E+02	ca**
Nonane, n-	181.0000	3.11E+01	nc
Norflurazon	4910.0000	1.24E+03	nc
OCDD	1.4100	1.97E-01	ca**
OCDF	1.4100	1.97E-01	ca**
Octabromodiphenyl Ether	1810.0000	3.11E+02	nc
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	29200.0000	5.13E+03	nc
Octamethylpyrophosphoramide	1200.0000	2.07E+02	nc
Octyl Phthalate, di-N-	6030.0000	1.04E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Oryzalin	13800.0000	2.58E+02	ca*
Oxadiazon	123.0000	6.50E+01	nc
Oxamyl	14800.0000	2.58E+03	nc
Oxyfluorfen	904.0000	9.12E+00	ca*
Paclobutrazol	1870.0000	6.92E+02	nc
Paraquat Dichloride	2710.0000	4.67E+02	nc
Parathion	380.0000	1.76E+02	nc
PeCDF, 1,2,3,7,8-	0.0141	1.97E-03	ca**
PeCDF, 2,3,4,7,8-	0.0014	1.97E-04	ca**
Pebulate	1710.0000	8.71E+02	nc
Pendimethalin	2480.0000	1.39E+03	nc
Pentabromodiphenyl Ether	1210.0000	2.07E+02	nc
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60.3000	1.04E+01	nc
Pentachlorobenzene	5.5500	3.13E+00	nc
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	14.1000	1.97E+00	ca**
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	14.1000	1.97E+00	ca**
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	14.1000	1.97E+00	ca**
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	14.1000	1.97E+00	ca**
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	0.0042	5.92E-04	ca**
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	0.0004	5.92E-05	ca**
Pentachloroethane	-	1.84E+01	ca
Pentachloronitrobenzene	61.2000	1.76E+00	ca*
Pentachlorophenol	41.3000	4.71E-01	ca*
Pentaerythritol tetranitrate (PETN)	643.0000	1.65E+02	nc
Pentane, n-	-		
Perchlorate and Perchlorate Salts	358.0000	6.89E+01	nc
Perfluorobutane sulfonic acid (PFBS)	12100.0000	2.07E+03	nc
Perfluorobutanesulfonate	12100.0000	2.07E+03	nc
Perfluorooctane sulfonic acid (PFOS)	12.1000	2.07E+00	nc
Perfluorooctanesulfonate	12.1000	2.07E+00	nc
Perfluorooctanoic acid (PFOA)	12.1000	2.07E+00	nc
Permethrin	30200.0000	5.18E+03	nc
Phenacetin	-	2.60E+03	ca
Phenmedipham	22100.0000	9.40E+03	nc
Phenol	88600.0000	2.38E+04	nc
Phenol, 2-(1-methylethoxy)-, methylcarbamate	1650.0000	3.64E+02	nc
Phenothiazine	10.4000	5.58E+00	nc
Phenyl Isothiocyanate	9.6800	4.71E+00	nc
Phenylenediamine, m-	3420.0000	6.11E+02	nc
Phenylenediamine, o-	2150.0000	6.00E+01	ca**
Phenylenediamine, p-	568.0000	1.02E+02	nc
Phenylmercuric Acetate	45.6000	8.15E+00	nc
Phenylphenol, 2-	-	8.48E+02	ca
Phorate	15.3000	6.82E+00	nc
Phosgene	-		
Phosmet	4640.0000	1.41E+03	nc
Phosphine	154.0000	2.95E+01	nc
Phosphoric Acid	24900000.0000	4.79E+06	nc
Phosphorus, White	10.2000	1.97E+00	nc
Phthalic Acid, P-	263000.0000	7.49E+04	nc
Phthalic Anhydride	665000.0000	1.67E+05	nc
Picloram	25100.0000	6.04E+03	nc
Picramic Acid (2-Amino-4,6-dinitrophenol)	50.2000	9.78E+00	nc
Picric Acid (2,4,6-Trinitrophenol)	415.0000	8.55E+01	nc
Pirimiphos, Methyl	2.8800	1.44E+00	nc
Polybrominated Biphenyls	4.2200	2.56E-01	ca**
Polychlorinated Biphenyls (low risk)	-	1.92E+01	ca
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	-		
Polyphosphoric acid	24900000.0000	4.79E+06	nc
Potassium Cyanide	889.0000	1.87E+02	nc
Potassium Perchlorate	311.0000	6.56E+01	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Potassium Perfluorobutane Sulfonate	12100.0000	2.07E+03	nc
Potassium Perfluorooctane Sulfonate	12.1000	2.07E+00	nc
Potassium Silver Cyanide	304.0000	1.42E+02	nc
Potassium tripolyphosphate	24900000.0000	4.79E+06	nc
Praseodymium Chloride (Stable, Nonradioactive)	-		
Prochloraz	647.0000	1.01E+01	ca*
Profluralin	46.7000	2.62E+01	nc
Prometon	1810.0000	7.11E+02	nc
Prometryn	2940.0000	1.32E+03	nc
Pronamide	6660.0000	2.86E+03	nc
Propachlor	3460.0000	9.79E+02	nc
Propanil	524.0000	2.15E+02	nc
Propargite	757.0000	2.22E+00	ca
Propargyl Alcohol	1100.0000	2.02E+02	nc
Propazine	2650.0000	1.01E+03	nc
Propham	3040.0000	1.10E+03	nc
Propiconazole	9790.0000	4.09E+03	nc
Propionaldehyde	-		
Propyl benzene	2480.0000	1.31E+03	nc
Propylene	-		
Propylene Glycol	11700000.0000	2.05E+06	nc
Propylene Glycol Dinitrate	-		
Propylene Glycol Monomethyl Ether	400000.0000	7.14E+04	nc
Propylene Oxide	-	2.93E+01	ca
Pyrene	213.0000	1.20E+02	nc
Pyridine	447.0000	9.39E+01	nc
Quinalphos	13.9000	7.27E+00	nc
Quinoline	-	1.28E+00	ca
Quizalofop-ethyl	494.0000	2.35E+02	nc
Resmethrin	108.0000	6.14E+01	nc
Ronnel	944.0000	5.09E+02	nc
Rotenone	318.0000	1.40E+02	nc
Rubidium	-		
Rubidium Chloride	-		
Rubidium Hydroxide	-		
Rubidium Iodide	-		
Safrole	-	3.34E+00	ca
Samarium Chloride (Stable, Nonradioactive)	-		
Samarium Nitrate (Stable, Nonradioactive)	-		
Selenious Acid	2560.0000	4.92E+02	nc
Selenium	2560.0000	4.92E+02	nc
Selenium Sulfide	2560.0000	4.92E+02	nc
Sethoxydim	5100.0000	2.58E+03	nc
Silica (crystalline, respirable)	-		
Silver	820.0000	2.89E+02	nc
Silver Cyanide	11000.0000	4.46E+03	nc
Simazine	1280.0000	3.67E+01	ca*
Sodium Acifluorfen	7640.0000	1.34E+03	nc
Sodium Azide	2050.0000	3.94E+02	nc
Sodium Cyanide	512.0000	9.85E+01	nc
Sodium Diethyldithiocarbamate	18000.0000	2.84E+01	ca
Sodium Fluoride	25600.0000	4.92E+03	nc
Sodium Fluoroacetate	12.1000	2.07E+00	nc
Sodium Metavanadate	512.0000	9.85E+01	nc
Sodium Perchlorate	358.0000	6.89E+01	nc
Sodium Tungstate	409.0000	7.88E+01	nc
Sodium Tungstate Dihydrate	409.0000	7.88E+01	nc
Sodium acid pyrophosphate	24900000.0000	4.79E+06	nc
Sodium aluminum phosphate (acidic)	24900000.0000	4.79E+06	nc
Sodium aluminum phosphate (anhydrous)	24900000.0000	4.79E+06	nc
Sodium aluminum phosphate (tetrahydrate)	24900000.0000	4.79E+06	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Sodium hexametaphosphate	24900000.0000	4.79E+06	nc
Sodium polyphosphate	24900000.0000	4.79E+06	nc
Sodium trimetaphosphate	24900000.0000	4.79E+06	nc
Sodium tripolyphosphate	24900000.0000	4.79E+06	nc
Stirofos (Tetrachlorovinphos)	4200.0000	1.13E+02	ca*
Strontium, Stable	307000.0000	5.91E+04	nc
Strychnine	130.0000	2.79E+01	nc
Styrene	12200.0000	5.71E+03	nc
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	290.0000	1.22E+02	nc
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	290.0000	1.22E+02	nc
Sulfolane	587.0000	1.03E+02	nc
Sulfonylbis(4-chlorobenzene), 1,1'-	45.2000	2.14E+01	nc
Sulfur Mustard	-		
Sulfur Trioxide	-		
Sulfuric Acid	-		
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	1130.0000	2.02E+01	ca*
TCDD, 2,3,7,8-	0.0004	5.92E-05	ca**
TCDF, 2,3,7,8-	0.0042	5.92E-04	ca**
TCMTB	2870.0000	1.21E+03	nc
Tebuthiuron	26000.0000	6.12E+03	nc
Temephos	12100.0000	2.07E+03	nc
Terbacil	4390.0000	1.09E+03	nc
Terbufos	0.6180	3.26E-01	nc
Terbutryn	53.7000	2.57E+01	nc
Tert-Butyl Acetate	-	8.82E+02	ca
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	60.3000	1.04E+01	nc
Tetrachlorobenzene, 1,2,4,5-	3.3300	1.85E+00	nc
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	4.2200	5.92E-01	ca**
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	1.4100	1.97E-01	ca**
Tetrachloroethane, 1,1,1,2-	2870.0000	7.51E+01	ca*
Tetrachloroethane, 1,1,2,2-	3640.0000	1.68E+01	ca*
Tetrachloroethylene	301.0000	1.46E+02	nc
Tetrachlorophenol, 2,3,4,6-	544.0000	2.94E+02	nc
Tetrachlorotoluene, p- alpha, alpha, alpha-	0.9400	2.21E-02	ca*
Tetraethyl Dithiopyrophosphate	30.6000	1.43E+01	nc
Tetraethyl Lead	0.0049	2.39E-03	nc
Tetrafluoroethane, 1,1,1,2-	-		
Tetrahydrofuran	423000.0000	8.61E+04	nc
Tetramethylcyclohexane	-		
Tetrapotassium phosphate	24900000.0000	4.79E+06	nc
Tetrasodium pyrophosphate	24900000.0000	4.79E+06	nc
Tetryl (Trinitrophenylmethylnitramine)	899.0000	1.88E+02	nc
Thallic Oxide	10.2000	1.97E+00	nc
Thallium (I) Nitrate	5.1200	9.85E-01	nc
Thallium (Soluble Salts)	5.1200	9.85E-01	nc
Thallium Acetate	5.8900	1.03E+00	nc
Thallium Carbonate	12.1000	2.07E+00	nc
Thallium Chloride	5.1200	9.85E-01	nc
Thallium Selenite	5.1200	9.85E-01	nc
Thallium Sulfate	10.2000	1.97E+00	nc
Thifensulfuron-methyl	22400.0000	4.26E+03	nc
Thiobencarb	931.0000	3.95E+02	nc
Thiocyanates	102.0000	1.97E+01	nc
Thiocyanic Acid	102.0000	1.97E+01	nc
Thiodiglycol	40900.0000	7.19E+03	nc
Thiofanox	46.4000	1.67E+01	nc
Thiophanate, Methyl	14000.0000	6.08E+02	ca**
Thiram	5920.0000	1.34E+03	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Tin	307000.0000	5.91E+04	nc
Titanium Tetrachloride	-		
Toluene	5940.0000	2.66E+03	nc
Toluene-2,4-diisocyanate	-	2.01E+00	ca
Toluene-2,5-diamine	109.0000	2.01E+01	nc
Toluene-2,6-diisocyanate	-	1.84E+01	ca
Toluic Acid, p-	867.0000	2.99E+02	nc
Toluidine, o- (Methylaniline, 2-)	-	3.40E+02	ca
Toluidine, p-	1320.0000	1.76E+02	ca**
Total Petroleum Hydrocarbons (Aliphatic High)	1810000.0000	3.11E+05	nc
Total Petroleum Hydrocarbons (Aliphatic Low)	-		
Total Petroleum Hydrocarbons (Aliphatic Medium)	6030.0000	1.04E+03	nc
Total Petroleum Hydrocarbons (Aromatic High)	24100.0000	4.15E+03	nc
Total Petroleum Hydrocarbons (Aromatic Low)	556.0000	2.08E+02	nc
Total Petroleum Hydrocarbons (Aromatic Medium)	120.0000	6.24E+01	nc
Toxaphene	54.3000	6.99E+00	ca**
Toxaphene, Weathered	18.1000	3.11E+00	nc
Tralomethrin	4520.0000	7.78E+02	nc
Tri-n-butyltin	13.1000	6.46E+00	nc
Triacetin	45400000.0000	8.14E+06	nc
Triadimefon	7230.0000	2.28E+03	nc
Triallate	572.0000	7.14E+00	ca*
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	24900000.0000	4.79E+06	nc
Triasulfuron	5630.0000	1.02E+03	nc
Tribenuron-methyl	2880.0000	6.91E+02	nc
Tribromobenzene, 1,2,4-	111.0000	5.92E+01	nc
Tribromophenol, 2,4,6-	476.0000	2.28E+02	nc
Tributyl Phosphate	433.0000	1.05E+02	ca**
Tributyltin Compounds	181.0000	3.11E+01	nc
Tributyltin Oxide	77.6000	2.23E+01	nc
Tricalcium phosphate	24900000.0000	4.79E+06	nc
Trichloro-1,2,2-trifluoroethane, 1,1,2-	2370000.0000	1.05E+06	nc
Trichloro-2'-hydroxydiphenylether	-		
Trichloroacetic Acid	8200.0000	8.72E+01	ca*
Trichloroaniline HCl, 2,4,6-	-	2.63E+02	ca
Trichloroaniline, 2,4,6-	1.5300	7.37E-01	nc
Trichlorobenzene, 1,2,3-	17.3000	9.23E+00	nc
Trichlorobenzene, 1,2,4-	226.0000	1.74E+01	ca**
Trichloroethane, 1,1,1-	266000.0000	1.01E+05	nc
Trichloroethane, 1,1,2-	997.0000	7.55E+01	ca**
Trichloroethylene	71.5000	2.65E+01	nc
Trichlorofluoromethane	39100.0000	1.50E+04	nc
Trichlorophenol, 2,4,5-	3860.0000	1.94E+03	nc
Trichlorophenol, 2,4,6-	40.2000	2.01E+01	nc
Trichlorophenoxyacetic Acid, 2,4,5-	1030.0000	4.26E+02	nc
Trichlorophenoxypropionic acid, -2,4,5	467.0000	2.20E+02	nc
Trichloropropane, 1,1,2-	773.0000	2.78E+02	nc
Trichloropropane, 1,2,3-	736.0000	3.16E-02	ca
Trichloropropene, 1,2,3-	300.0000	1.25E+02	nc
Tricresyl Phosphate (TCP)	360.0000	1.95E+02	nc
Tridiphane	36.0000	1.99E+01	nc
Triethylamine	-		
Triethylene Glycol	1200000.0000	2.07E+05	nc
Trifluoroethane, 1,1,1-	-		
Trifluralin	77.6000	3.06E+01	ca**
Trimagnesium phosphate	24900000.0000	4.79E+06	nc
Trimethyl Phosphate	5870.0000	3.79E+02	ca**
Trimethylbenzene, 1,2,3-	258.0000	1.36E+02	nc
Trimethylbenzene, 1,2,4-	270.0000	1.41E+02	nc

Chemical	Noncarcinogenic SL (Adult) THQ=0.1 (ug/L)	Screening Level (ug/L)	
Trimethylbenzene, 1,3,5-	362.0000	1.83E+02	nc
Trimethylpentene, 2,4,4-	67.5000	3.80E+01	nc
Trinitrobenzene, 1,3,5-	14200.0000	2.88E+03	nc
Trinitrotoluene, 2,4,6-	205.0000	4.55E+01	nc
Triphenylphosphine Oxide	3740.0000	1.25E+03	nc
Tripotassium phosphate	24900000.0000	4.79E+06	nc
Tris(1,3-Dichloro-2-propyl) Phosphate	3350.0000	1.17E+03	nc
Tris(1-chloro-2-propyl)phosphate	2840.0000	7.78E+02	nc
Tris(2,3-dibromopropyl)phosphate	-	3.34E+00	ca
Tris(2-chloroethyl)phosphate	3370.0000	3.37E+02	ca**
Tris(2-ethylhexyl)phosphate	60300.0000	2.40E+03	ca**
Trisbutoxyethyl Phosphate	-		
Trisodium phosphate	24900000.0000	4.79E+06	nc
Tungsten	409.0000	7.88E+01	nc
Uranium	102.0000	1.97E+01	nc
Urethane	-	1.78E+00	ca
Vanadium Pentoxide	690.0000	3.07E+02	nc
Vanadium and Compounds	386.0000	1.72E+02	nc
Vernolate	33.6000	1.72E+01	nc
Vinclozolin	187.0000	6.71E+01	nc
Vinyl Acetate	441000.0000	9.35E+04	nc
Vinyl Bromide	-		
Vinyl Chloride	642.0000	5.57E-02	ca
Warfarin	72.3000	2.15E+01	nc
Xylene, m-	8880.0000	4.38E+03	nc
Xylene, o-	9890.0000	4.79E+03	nc
Xylene, p-	9500.0000	4.64E+03	nc
Xylenes	9380.0000	4.59E+03	nc
Zinc Cyanide	27200.0000	5.02E+03	nc
Zinc Phosphide	163.0000	3.01E+01	nc
Zinc and Compounds	163000.0000	3.01E+04	nc
Zineb	24800.0000	4.87E+03	nc
Zirconium	40.9000	7.88E+00	nc

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Site-specific
Recreator Surface Water Inputs

Variable	Recreator Surface Water Default Value	Form-input Value
$DFA_{rec-adj}$ (age-adjusted immersion factor - recreator) hr		1144
ED_{rec} (exposure duration - recreator) yr		26
ED_{rec-a} (exposure duration - recreator adult) yr		20
ED_{rec-c} (exposure duration - recreator child) yr		6
EF_{rec-a} (exposure frequency - recreator adult) day/yr		22
EF_{rec-c} (exposure frequency - recreator child) day/yr		22
$ET_{event-rec-a}$ (exposure time - recreator adult) hr/event		2
$ET_{event-rec-c}$ (exposure time - recreator child) hr/event		2
EV_{rec-a} (number of bathing events per day - recreator adult) event/day		1
EV_{rec-c} (number of bathing events per day - recreator child) event/day		1
$IFW_{rec-adj}$ (age-adjusted water intake rate - recreator) L		128.48
IRW_{rec-a} (water intake rate - recreator adult) L/hr	0.11	0.11
IRW_{rec-c} (water intake rate - recreator child) L/hr	0.12	0.12
TR (target cancer risk) unitless	0.000001	0.000001

Site-specific
Recreator PRGs for Surface Water - Secular Equilibrium

Isotope	Ingestion PRG TR=1.0E-06 (pCi/L)	Immersion PRG TR=1.0E-06 (pCi/L)	Total PRG TR=1.0E-06 (pCi/L)
Secular Equilibrium PRG for Ra-226	*2.55E+00*	*4.56E+05*	*2.55E+00*
Secular Equilibrium PRG for Ra-228	*5.82E+00*	*3.34E+05*	*5.82E+00*
Secular Equilibrium PRG for Th-228	*2.59E+01*	*5.19E+05*	*2.59E+01*
Secular Equilibrium PRG for Th-230	*2.47E+00*	*4.56E+05*	*2.47E+00*
Secular Equilibrium PRG for Th-232	*5.41E+00*	*3.34E+05*	*5.41E+00*
Secular Equilibrium PRG for U-234	*2.42E+00*	*4.56E+05*	*2.42E+00*
Secular Equilibrium PRG for U-235	*1.06E+01*	*1.38E+06*	*1.06E+01*
Secular Equilibrium PRG for U-238	*2.36E+00*	*4.49E+05*	*2.36E+00*

APPENDIX E

Fish Tissue Screening Levels

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Site-specific

Fish Equation Inputs for Fish

* Inputted values different from Fish defaults are highlighted.

Variable	Fish Fish Default Value	Form-input Value
AT (averaging time)	365	365
BW_{res-a} (body weight) kg	80	15
ED_{res} (exposure duration) yr	26	6
EF_{res-a} (exposure frequency) days/yr	350	350
THQ (target hazard quotient) unitless	0.1	0.1
$IRFI_{res-a}$ (fish consumption rate - adult) mg/day		71200
LT (lifetime) yr	70	70
TR (target cancer risk) unitless	0.000001	0.000001

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Site-specific

Fish Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	SF_o(mg/kg-day)$^{-1}$	SF_oRef	RfD (mg/kg-day)	RfD Ref	Ingestion SL TR=1E-06 (mg/kg)	Ingestion SL THQ=0.1 (mg/kg)	Screening Level (mg/kg)
Acenaphthene	83-32-9	No	Yes	-		0	I	-	1	1.32E+00 nc
Acephate	30560-19-1	No	No	-		0	O	-	0	2.64E-02 nc
Acetaldehyde	75-07-0	No	Yes	-		-		-	-	
Acetochlor	34256-82-1	No	No	-		0	I	-	0	4.39E-01 nc
Acetone	67-64-1	No	Yes	-		1	I	-	20	1.98E+01 nc
Acetone Cyanohydrin	75-86-5	No	No	-		-		-	-	
Acetonitrile	75-05-8	No	Yes	-		-		-	-	
Acetophenone	98-86-2	No	Yes	-		0	I	-	2	2.20E+00 nc
Acetylaminofluorene, 2-	53-96-3	No	No	4	C	-		0	-	6.75E-04 ca
Acrolein	107-02-8	No	Yes	-		0	I	-	0	1.10E-02 nc
Acrylamide	79-06-1	Yes	No	1	I	0	I	0	0	5.13E-03 ca**
Acrylic Acid	79-10-7	No	Yes	-		1	I	-	11	1.10E+01 nc
Acrylonitrile	107-13-1	No	Yes	1	I	0	A	0	1	4.75E-03 ca
Adiponitrile	111-69-3	No	No	-		-		-	-	
Alachlor	15972-60-8	No	No	0	C	0	I	0	0	4.58E-02 ca**
Aldicarb	116-06-3	No	No	-		0	I	-	0	2.20E-02 nc
Aldicarb Sulfone	1646-88-4	No	No	-		0	I	-	0	2.20E-02 nc
Aldrin	309-00-2	No	Yes	17	I	0	I	0	0	1.51E-04 ca**
Allyl Alcohol	107-18-6	No	Yes	-		0	I	-	0	1.10E-01 nc
Allyl Chloride	107-05-1	No	Yes	0	C	-		0	-	1.22E-01 ca
Aluminum	7429-90-5	No	No	-		1	P	-	22	2.20E+01 nc
Aluminum Phosphide	20859-73-8	No	No	-		0	I	-	0	8.79E-03 nc
Aluminum metaphosphate	13776-88-0	No	No	-		49	P	-	1070	1.07E+03 nc
Ametryn	834-12-8	No	No	-		0	I	-	0	1.98E-01 nc
Aminobiphenyl, 4-	92-67-1	No	No	21	C	-		0	-	1.22E-04 ca
Aminophenol, m-	591-27-5	No	No	-		0	P	-	2	1.76E+00 nc
Aminophenol, o-	95-55-6	No	No	-		0	X	-	0	8.79E-02 nc
Aminophenol, p-	123-30-8	No	No	-		0	P	-	0	4.39E-01 nc
Amitraz	33089-61-1	No	No	-		0	I	-	0	5.49E-02 nc
Ammonium Perchlorate	7790-98-9	No	No	-		0	I	-	0	1.54E-02 nc
Ammonium Sulfamate	7773-06-0	No	No	-		0	I	-	4	4.39E+00 nc
Ammonium polyphosphate	68333-79-9	No	No	-		49	P	-	1070	1.07E+03 nc
Amyl Alcohol, tert-	75-85-4	No	Yes	-		-		-	-	
Aniline	62-53-3	No	No	0	I	0	P	0	0	1.54E-01 nc
Anthracene	120-12-7	No	Yes	-		0	I	-	7	6.59E+00 nc
Anthraquinone, 9,10-	84-65-1	No	No	0	P	0	X	0	0	4.39E-02 nc
Antimony (metallic)	7440-36-0	No	No	-		0	I	-	0	8.79E-03 nc
Antimony Pentoxide	1314-60-9	No	No	-		0	H	-	0	1.10E-02 nc
Antimony Potassium Tartrate	11071-15-1	No	No	-		-		-	-	
Antimony Tetroxide	1332-81-6	No	No	-		0	H	-	0	8.79E-03 nc
Antimony Trichloride	10025-91-9	No	No	-		-		-	-	
Antimony Trioxide	1309-64-4	No	No	-		-		-	-	
Aroclor 1016	12674-11-2	No	Yes	0	G	0	I	0	0	1.54E-03 nc
Aroclor 1221	11104-28-2	No	Yes	2	G	-		0	-	1.28E-03 ca
Aroclor 1232	11141-16-5	No	Yes	2	G	-		0	-	1.28E-03 ca
Aroclor 1242	53469-21-9	No	Yes	2	G	-		0	-	1.28E-03 ca
Aroclor 1248	12672-29-6	No	Yes	2	G	-		0	-	1.28E-03 ca
Aroclor 1254	11097-69-1	No	Yes	2	G	0	I	0	0	4.39E-04 nc
Aroclor 1260	11096-82-5	No	Yes	2	G	-		0	-	1.28E-03 ca
Aroclor 5460	11126-42-4	No	Yes	-		0	X	-	0	1.32E-02 nc
Arsenic, Inorganic	7440-38-2	No	No	2	I	0	I	0	0	1.71E-03 ca**
Arsine	7784-42-1	No	No	-		0	C	-	0	7.69E-05 nc
Asulam	3337-71-1	No	No	-		0	O	-	1	7.91E-01 nc
Atrazine	1912-24-9	No	No	0	C	0	I	0	1	1.11E-02 ca*
Auramine	492-80-8	No	No	1	C	-		0	-	2.91E-03 ca
Avermectin B1	65195-55-3	No	No	-		0	I	-	0	8.79E-03 nc
Azinphos-methyl	86-50-0	No	No	-		0	A	-	0	6.59E-02 nc
Azobenzene	103-33-3	No	Yes	0	I	-		0	-	2.33E-02 ca
Azodicarbonamide	123-77-3	No	No	-		1	P	-	22	2.20E+01 nc
Barium	7440-39-3	No	No	-		0	I	-	4	4.39E+00 nc
Benfluralin	1861-40-1	No	Yes	-		0	O	-	0	1.10E-01 nc
Benomyl	17804-35-2	No	No	-		0	I	-	1	1.10E+00 nc
Bensulfuron-methyl	83055-99-6	No	No	-		0	I	-	4	4.39E+00 nc
Bentazon	25057-89-0	No	No	-		0	I	-	1	6.59E-01 nc
Benz[a]anthracene	56-55-3	Yes	Yes	0	E	-		0	-	2.56E-02 ca
Benzaldehyde	100-52-7	No	Yes	0	P	0	I	1	2	6.41E-01 ca**
Benzene	71-43-2	No	Yes	0	I	0	I	0	0	4.66E-02 ca**
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	No	No	0	X	0	X	0	0	6.59E-03 nc
Benzenethiol	108-98-5	No	Yes	-		0	P	-	0	2.20E-02 nc
Benzidine	92-87-5	Yes	No	230	I	0	I	0	0	1.11E-05 ca
Benzo(j)fluoranthene	205-82-3	No	No	1	C	-		0	-	2.14E-03 ca
Benzo[a]pyrene	50-32-8	Yes	No	1	I	0	I	0	0	2.56E-03 ca**
Benzo[b]fluoranthene	205-99-2	Yes	No	0	E	-		0	-	2.56E-02 ca
Benzo[k]fluoranthene	207-08-9	Yes	No	0	E	-		0	-	2.56E-01 ca
Benzoic Acid	65-85-0	No	No	-		4	I	-	88	8.79E+01 nc
Benzotrichloride	98-07-7	No	Yes	13	I	-		0	-	1.97E-04 ca
Benzyl Alcohol	100-51-6	No	No	-		0	P	-	2	2.20E+00 nc
Benzyl Chloride	100-44-7	No	Yes	0	I	0	P	0	0	1.51E-02 ca**
Beryllium and compounds	7440-41-7	No	No	-		0	I	-	0	4.39E-02 nc
Bifenox	42576-02-3	No	No	-		0	P	-	0	1.98E-01 nc
Biphenthrin	82657-04-3	No	No	-		0	I	-	0	3.30E-01 nc
Biphenyl, 1,1'-	92-52-4	No	Yes	0	I	1	I	0	11	3.20E-01 ca*
Bis(2-chloro-1-methylethyl) ether	108-60-1	No	Yes	-		0	I	-	1	8.79E-01 nc
Bis(2-chloroethoxy)methane	111-91-1	No	No	-		0	P	-	0	6.59E-02 nc
Bis(2-chloroethyl)ether	111-44-4	No	Yes	1	I	-		0	-	2.33E-03 ca
Bis(2-ethylhexyl)phthalate	117-81-7	No	No	0	I	0	I	0	0	1.83E-01 ca**

Bis(chloromethyl)ether	542-88-1	No	Yes	220	I	-		0	-	1.17E-05 ca
Bisphenol A	80-05-7	No	No	-		0	I	-	1	1.10E+00 nc
Boron And Borates Only	7440-42-8	No	No	-		0	I	-	4	4.39E+00 nc
Boron Trichloride	10294-34-5	No	Yes	-		2	P	-	44	4.39E+01 nc
Boron Trifluoride	7637-07-2	No	Yes	-		0	C	-	1	8.79E-01 nc
Bromate	15541-45-4	No	No	1	I	0	I	0	0	3.66E-03 ca*
Bromo-2-chloroethane, 1-	107-04-0	No	Yes	2	X	-		0	-	1.28E-03 ca
Bromo-3-fluorobenzene, 1-	1073-06-9	No	Yes	-		0	X	-	0	6.59E-03 nc
Bromo-4-fluorobenzene, 1-	460-00-4	No	Yes	-		0	X	-	0	6.59E-03 nc
Bromobenzene	108-86-1	No	Yes	-		0	I	-	0	1.76E-01 nc
Bromochloromethane	74-97-5	No	Yes	-		-		-	-	
Bromodichloromethane	75-27-4	No	Yes	0	I	0	I	0	0	4.13E-02 ca*
Bromoform	75-25-2	No	Yes	0	I	0	I	0	0	3.24E-01 ca**
Bromomethane	74-83-9	No	Yes	-		0	I	-	0	3.08E-02 nc
Bromophos	2104-96-3	No	Yes	-		0	H	-	0	1.10E-01 nc
Bromopropane, 1-	106-94-5	No	Yes	-		-		-	-	
Bromoxynil	1689-84-5	No	No	0	O	0	O	0	0	2.49E-02 ca*
Bromoxynil Octanoate	1689-99-2	No	Yes	0	O	0	O	0	0	2.49E-02 ca*
Butadiene, 1,3-	106-99-0	No	Yes	1	C	-		0	-	4.27E-03 ca
Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6	No	No	-		0	O	-	1	6.59E-01 nc
Butanol, N-	71-36-3	No	Yes	-		0	I	-	2	2.20E+00 nc
Butyl Benzyl Phthalate	85-68-7	No	No	0	P	0	I	1	4	1.35E+00 ca**
Butyl Formate, tert-	762-75-4	No	Yes	-		-		-	-	
Butyl alcohol, sec-	78-92-2	No	Yes	-		2	P	-	44	4.39E+01 nc
Butylate	2008-41-5	No	Yes	-		0	I	-	1	1.10E+00 nc
Butylated hydroxyanisole	25013-16-5	No	No	0	C	-		13	-	1.28E+01 ca
Butylated hydroxytoluene	128-37-0	No	No	0	P	0	P	1	7	7.12E-01 ca**
Butylbenzene, n-	104-51-8	No	Yes	-		0	P	-	1	1.10E+00 nc
Butylbenzene, sec-	135-98-8	No	Yes	-		0	X	-	2	2.20E+00 nc
Butylbenzene, tert-	98-06-6	No	Yes	-		0	X	-	2	2.20E+00 nc
Butylphthalyl Butylglycolate	85-70-1	No	No	-		1	I	-	22	2.20E+01 nc
Cacodylic Acid	75-60-5	No	No	-		0	A	-	0	4.39E-01 nc
Cadmium (Diet)	7440-43-9	No	No	-		0	I	-	0	2.20E-02 nc
Calcium Cyanide	592-01-8	No	No	-		0	I	-	0	2.20E-02 nc
Calcium pyrophosphate	7790-76-3	No	No	-		49	P	-	1070	1.07E+03 nc
Caprolactam	105-60-2	No	No	-		1	I	-	11	1.10E+01 nc
Captafol	2425-06-1	No	No	0	C	0	I	0	0	1.71E-02 ca**
Captan	133-06-2	No	No	0	C	0	I	1	3	1.11E+00 ca**
Carbaryl	63-25-2	No	No	-		0	I	-	2	2.20E+00 nc
Carbofuran	1563-66-2	No	No	-		0	I	-	0	1.10E-01 nc
Carbon Disulfide	75-15-0	No	Yes	-		0	I	-	2	2.20E+00 nc
Carbon Tetrachloride	56-23-5	No	Yes	0	I	0	I	0	0	3.66E-02 ca**
Carbonyl Sulfide	463-58-1	No	Yes	-		-		-	-	
Carbosulfan	55285-14-8	No	No	-		0	I	-	0	2.20E-01 nc
Carboxin	5234-68-4	No	No	-		0	I	-	2	2.20E+00 nc
Ceric oxide	1306-38-3	No	No	-		-		-	-	
Chloral	75-87-6	No	Yes	-		-		-	-	
Chloral Hydrate	302-17-0	No	Yes	-		0	I	-	2	2.20E+00 nc
Chloramben	133-90-4	No	No	-		0	I	-	0	3.30E-01 nc
Chloranil	118-75-2	No	No	0	H	-		0	-	6.36E-03 ca
Chlordane (technical mixture)	12789-03-6	No	Yes	0	I	0	I	0	0	7.32E-03 ca**
Chlordecone (Kepone)	143-50-0	No	No	10	I	0	I	0	0	2.56E-04 ca*
Chlorfenvinphos	470-90-6	No	No	-		0	A	-	0	1.54E-02 nc
Chlorimuron, Ethyl-	90982-32-4	No	No	-		0	O	-	2	1.98E+00 nc
Chlorine	7782-50-5	No	Yes	-		0	I	-	2	2.20E+00 nc
Chlorine Dioxide	10049-04-4	No	Yes	-		0	I	-	1	6.59E-01 nc
Chlorite (Sodium Salt)	7758-19-2	No	No	-		0	I	-	1	6.59E-01 nc
Chloro-1,1-difluoroethane, 1-	75-68-3	No	Yes	-		-		-	-	
Chloro-1,3-butadiene, 2-	126-99-8	No	Yes	-		0	H	-	0	4.39E-01 nc
Chloro-2-methylaniline HCl, 4-	3165-93-3	No	No	0	H	-		0	-	5.57E-03 ca
Chloro-2-methylaniline, 4-	95-69-2	No	No	0	P	0	X	0	0	2.56E-02 ca**
Chloroacetaldehyde, 2-	107-20-0	No	Yes	0	X	-		0	-	9.49E-03 ca
Chloroacetophenone, 2-	532-27-4	No	No	-		-		-	-	
Chloroaniline, p-	106-47-8	No	No	0	P	0	I	0	0	1.28E-02 ca**
Chlorobenzene	108-90-7	No	Yes	-		0	I	-	0	4.39E-01 nc
Chlorobenzene sulfonic acid, p-	98-66-8	No	No	-		0	X	-	2	2.20E+00 nc
Chlorobenzilate	510-15-6	No	No	0	C	0	I	0	0	2.33E-02 ca*
Chlorobenzoic Acid, p-	74-11-3	No	No	-		0	X	-	1	6.59E-01 nc
Chlorobenzotrifluoride, 3-nitro-4-	121-17-5	No	Yes	-		-		-	-	
Chlorobenzotrifluoride, 4-	98-56-6	No	Yes	-		0	P	-	0	6.59E-02 nc
Chlorobutane, 1-	109-69-3	No	Yes	-		0	P	-	1	8.79E-01 nc
Chlorodifluoromethane	75-45-6	No	Yes	-		-		-	-	
Chloroethanol, 2-	107-07-3	No	Yes	-		0	P	-	0	4.39E-01 nc
Chloroform	67-66-3	No	Yes	0	C	0	I	0	0	8.27E-02 ca**
Chloromethane	74-87-3	No	Yes	-		-		-	-	
Chloromethyl Methyl Ether	107-30-2	No	Yes	2	C	-		0	-	1.07E-03 ca
Chloronaphthalene, Beta-	91-58-7	No	Yes	-		0	I	-	2	1.76E+00 nc
Chloronitrobenzene, o-	88-73-3	No	No	0	P	0	P	0	0	8.54E-03 ca**
Chloronitrobenzene, p-	100-00-5	No	No	0	P	0	P	0	0	1.54E-02 nc
Chlorophenol, 2-	95-57-8	No	Yes	-		0	I	-	0	1.10E-01 nc
Chloropicrin	76-06-2	No	Yes	-		-		-	-	
Chlorothalonil	1897-45-6	No	No	0	C	0	I	0	0	1.51E-01 ca**
Chlorotoluene, o-	95-49-8	No	Yes	-		0	I	-	0	4.39E-01 nc
Chlorotoluene, p-	106-43-4	No	Yes	-		0	X	-	0	4.39E-01 nc
Chlorozotocin	54749-90-5	No	No	240	C	-		0	-	1.07E-05 ca
Chlorpropham	101-21-3	No	No	-		0	O	-	1	1.10E+00 nc
Chlorpyrifos	2921-88-2	No	No	-		0	A	-	0	2.20E-02 nc
Chlorpyrifos Methyl	5598-13-0	No	No	-		0	H	-	0	2.20E-01 nc
Chlorsulfuron	64902-72-3	No	No	-		0	O	-	1	1.10E+00 nc
Chlorthal-dimethyl	1861-32-1	No	No	-		0	I	-	0	2.20E-01 nc
Chlorthiophos	60238-56-4	No	No	-		0	H	-	0	1.76E-02 nc
Chromium(III), Insoluble Salts	16065-83-1	No	No	-		2	I	-	33	3.30E+01 nc
Chromium(VI)	18540-29-9	Yes	No	1	C	0	I	0	0	5.13E-03 ca*
Chrysene	218-01-9	Yes	No	0	E	-		3	-	2.56E+00 ca
Clofentezine	74115-24-5	No	No	-		0	I	-	0	2.86E-01 nc
Cobalt	7440-48-4	No	No	-		0	P	-	0	6.59E-03 nc

Copper	7440-50-8	No	No	-		0	H	-	1	8.79E-01 nc
Copper Cyanide	544-92-3	No	No	-		0	I	-	0	1.10E-01 nc
Cresol, m-	108-39-4	No	No	-		0	I	-	1	1.10E+00 nc
Cresol, o-	95-48-7	No	No	-		0	I	-	1	1.10E+00 nc
Cresol, p-	106-44-5	No	No	-		0	A	-	2	2.20E+00 nc
Cresol, p-chloro-m-	59-50-7	No	No	-		0	A	-	2	2.20E+00 nc
Cresols	1319-77-3	No	No	-		0	A	-	2	2.20E+00 nc
Crotonaldehyde, trans-	123-73-9	No	Yes	2	H	0	P	0	0	1.35E-03 ca*
Cumene	98-82-8	No	Yes	-		0	I	-	2	2.20E+00 nc
Cupferron	135-20-6	No	No	0	C	-		0	-	1.17E-02 ca
Cyanazine	21725-46-2	No	No	1	H	0	H	0	0	3.05E-03 ca*
Cyanide (CN-)	57-12-5	No	Yes	-		0	I	-	0	1.32E-02 nc
Cyanogen	460-19-5	No	Yes	-		0	I	-	0	2.20E-02 nc
Cyanogen Bromide	506-68-3	No	Yes	-		0	I	-	2	1.98E+00 nc
Cyanogen Chloride	506-77-4	No	Yes	-		0	I	-	1	1.10E+00 nc
Cyclohexane	110-82-7	No	Yes	-		-		-	-	
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	No	No	0	X	0	X	0	0	1.28E-01 ca**
Cyclohexanone	108-94-1	No	Yes	-		5	I	-	110	1.10E+02 nc
Cyclohexene	110-83-8	No	Yes	-		0	P	-	0	1.10E-01 nc
Cyclohexylamine	108-91-8	No	Yes	-		0	I	-	4	4.39E+00 nc
Cyclopentadiene	542-92-7	No	Yes	-		-		-	-	
Cyfluthrin	68359-37-5	No	No	-		0	I	-	1	5.49E-01 nc
Cyhalothrin	68085-85-8	No	No	-		0	O	-	0	2.20E-02 nc
Cyromazine	66215-27-8	No	No	-		1	O	-	11	1.10E+01 nc
DDD, p,p`- (DDD)	72-54-8	No	No	0	I	0	X	0	0	6.59E-04 nc
DDE, p,p'-	72-55-9	No	Yes	0	I	0	X	0	0	6.59E-03 nc
DDT	50-29-3	No	No	0	I	0	I	0	0	7.54E-03 ca**
Dalapon	75-99-0	No	No	-		0	I	-	1	6.59E-01 nc
Daminozide	1596-84-5	No	No	0	C	0	I	0	3	1.42E-01 ca*
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	No	No	0	I	0	I	4	0	1.54E-01 nc
Decane	124-18-5	No	Yes	-		-		-	-	
Demeton	8065-48-3	No	No	-		0	I	-	0	8.79E-04 nc
Di(2-ethylhexyl)adipate	103-23-1	No	No	0	I	1	I	2	13	2.14E+00 ca**
Diallate	2303-16-4	No	No	0	H	-		0	-	4.20E-02 ca
Diammonium phosphate	7783-28-0	No	No	-		49	P	-	1070	1.07E+03 nc
Diazinon	333-41-5	No	No	-		0	A	-	0	1.54E-02 nc
Dibenz[a,h]anthracene	53-70-3	Yes	No	1	E	-		0	-	2.56E-03 ca
Dibenzo(a,e)pyrene	192-65-4	No	No	12	C	-		0	-	2.14E-04 ca
Dibenzofuran	132-64-9	No	Yes	-		0	X	-	0	2.20E-02 nc
Dibenzothiophene	132-65-0	No	Yes	-		0	X	-	0	2.20E-01 nc
Dibromo-3-chloropropane, 1,2-	96-12-8	Yes	Yes	1	P	0	P	0	0	3.20E-03 ca**
Dibromobenzene, 1,3-	108-36-1	No	Yes	-		0	X	-	0	8.79E-03 nc
Dibromobenzene, 1,4-	106-37-6	No	Yes	-		0	I	-	0	2.20E-01 nc
Dibromochloromethane	124-48-1	No	Yes	0	I	0	I	0	0	3.05E-02 ca*
Dibromoethane, 1,2-	106-93-4	No	Yes	2	I	0	I	0	0	1.28E-03 ca
Dibromomethane (Methylene Bromide)	74-95-3	No	Yes	-		-		-	-	
Dibutyl Phthalate	84-74-2	No	No	-		0	I	-	2	2.20E+00 nc
Dibutyltin Compounds	NA	No	No	-		0	P	-	0	6.59E-03 nc
Dibutyltin dichloride	683-18-1	No	Yes	-		-		-	-	
Dicalcium phosphate	7757-93-9	No	No	-		49	P	-	1070	1.07E+03 nc
Dicamba	1918-00-9	No	No	-		0	I	-	1	6.59E-01 nc
Dichloro-2-butene, 1,4-	764-41-0	No	Yes	-		-		-	-	
Dichloro-2-butene, cis-1,4-	1476-11-5	No	Yes	-		-		-	-	
Dichloro-2-butene, trans-1,4-	110-57-6	No	Yes	-		-		-	-	
Dichloroacetic Acid	79-43-6	No	No	0	I	0	I	0	0	5.13E-02 ca**
Dichlorobenzene, 1,2-	95-50-1	No	Yes	-		0	I	-	2	1.98E+00 nc
Dichlorobenzene, 1,3-	541-73-1	No	Yes	-		-		-	-	
Dichlorobenzene, 1,4-	106-46-7	No	Yes	0	C	0	A	0	2	4.75E-01 ca**
Dichlorobenzidine, 3,3'-	91-94-1	No	No	0	I	-		0	-	5.70E-03 ca
Dichlorobenzophenone, 4,4'-	90-98-2	No	No	-		0	X	-	0	1.98E-01 nc
Dichlorobenzotrifluoride, 3,4-	328-84-7	No	Yes	-		-		-	-	
Dichlorodifluoromethane	75-71-8	No	Yes	-		0	I	-	4	4.39E+00 nc
Dichlorodiisopropyl ether, 2,2'-	39638-32-9	No	Yes	-		-		-	-	
Dichloroethane, 1,1-	75-34-3	No	Yes	0	C	0	P	0	4	4.50E-01 ca**
Dichloroethane, 1,2-	107-06-2	No	Yes	0	I	0	X	0	0	2.82E-02 ca**
Dichloroethylene, 1,1-	75-35-4	No	Yes	-		0	I	-	1	1.10E+00 nc
Dichloroethylene, 1,2-cis-	156-59-2	No	Yes	-		0	I	-	0	4.39E-02 nc
Dichloroethylene, 1,2-trans-	156-60-5	No	Yes	-		0	I	-	0	4.39E-01 nc
Dichlorophenol, 2,4-	120-83-2	No	No	-		0	I	-	0	6.59E-02 nc
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	No	No	-		0	I	-	0	2.20E-01 nc
Dichloropropane, 1,2-	78-87-5	No	Yes	0	P	0	P	0	1	6.93E-02 ca*
Dichloropropane, 1,3-	142-28-9	No	Yes	-		0	P	-	0	4.39E-01 nc
Dichloropropanol, 2,3-	616-23-9	No	No	-		0	I	-	0	6.59E-02 nc
Dichloropropene, 1,3-	542-75-6	No	Yes	0	I	0	I	0	1	2.56E-02 ca*
Dichlorvos	62-73-7	No	No	0	I	0	I	0	0	8.84E-03 ca**
Dicrotophos	141-66-2	No	No	-		0	O	-	0	6.59E-04 nc
Dicyclopentadiene	77-73-6	No	Yes	-		0	P	-	2	1.76E+00 nc
Dieldrin	60-57-1	No	No	16	I	0	I	0	0	1.60E-04 ca**
Diethanolamine	111-42-2	No	No	-		0	P	-	0	4.39E-02 nc
Diethyl Phthalate	84-66-2	No	No	-		1	I	-	18	1.76E+01 nc
Diethyl-meta-Toluamide, N,N (DEET)	134-62-3	No	No	-		-		-	-	
Diethylene Glycol Monobutyl Ether	112-34-5	No	No	-		0	P	-	1	6.59E-01 nc
Diethylene Glycol Monoethyl Ether	111-90-0	No	No	-		0	P	-	1	1.32E+00 nc
Diethylformamide	617-84-5	No	Yes	-		0	P	-	0	2.20E-02 nc
Diethylstilbestrol	56-53-1	No	No	350	C	-		0	-	7.32E-06 ca
Difenzoquat	43222-48-6	No	No	-		0	O	-	2	1.82E+00 nc
Diflubenzuron	35367-38-5	No	No	-		0	I	-	0	4.39E-01 nc
Difluoroethane, 1,1-	75-37-6	No	Yes	-		-		-	-	
Difluoropropane, 2,2-	420-45-1	No	Yes	-		-		-	-	
Dihydrosafrole	94-58-6	No	Yes	0	C	-		0	-	5.83E-02 ca
Diisopropyl Ether	108-20-3	No	Yes	-		-		-	-	
Diisopropyl Methylphosphonate	1445-75-6	No	Yes	-		0	I	-	2	1.76E+00 nc
Dimagnesium phosphate	7782-75-4	No	No	-		49	P	-	1070	1.07E+03 nc
Dimethipin	55290-64-7	No	No	-		0	O	-	0	4.79E-01 nc
Dimethoate	60-51-5	No	No	-		0	O	-	0	4.83E-02 nc
Dimethoxybenzidine, 3,3'-	119-90-4	No	No	2	P	-		0	-	1.60E-03 ca
Dimethyl methylphosphonate	756-79-6	No	No	0	P	0	P	2	1	1.32E+00 nc

Dimethylamino azobenzene [p-]	60-11-7	No	No	5	C	-		0	-	5.57E-04 ca
Dimethylaniline HCl, 2,4-	21436-96-4	No	No	1	H	-		0	-	4.42E-03 ca
Dimethylaniline, 2,4-	95-68-1	No	No	0	P	0	X	0	0	1.28E-02 ca**
Dimethylaniline, N,N-	121-69-7	No	Yes	0	P	0	I	0	0	4.39E-02 nc
Dimethylbenz(a)anthracene, 7,12-	57-97-6	Yes	No	250	C	-		0	-	1.03E-05 ca
Dimethylbenzidine, 3,3'-	119-93-7	No	No	11	P	-		0	-	2.33E-04 ca
Dimethylformamide	68-12-2	No	Yes	-		0	P	-	2	2.20E+00 nc
Dimethylhydrazine, 1,1-	57-14-7	No	Yes	-		0	X	-	0	2.20E-03 nc
Dimethylhydrazine, 1,2-	540-73-8	No	Yes	550	C	-		0	-	4.66E-06 ca
Dimethylphenol, 2,4-	105-67-9	No	No	-		0	I	-	0	4.39E-01 nc
Dimethylphenol, 2,6-	576-26-1	No	No	-		0	I	-	0	1.32E-02 nc
Dimethylphenol, 3,4-	95-65-8	No	No	-		0	I	-	0	2.20E-02 nc
Dimethylphthalate	131-11-3	No	No	-		-		-	-	
Dimethylterephthalate	120-61-6	No	Yes	-		0	I	-	2	2.20E+00 nc
Dimethylvinylchloride	513-37-1	No	Yes	0	C	-		0	-	5.70E-02 ca
Dinitro-o-cresol, 4,6-	534-52-1	No	No	-		0	X	-	0	1.76E-03 nc
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	No	No	-		0	I	-	0	4.39E-02 nc
Dinitrobenzene, 1,2-	528-29-0	No	No	-		0	P	-	0	2.20E-03 nc
Dinitrobenzene, 1,3-	99-65-0	No	No	-		0	I	-	0	2.20E-03 nc
Dinitrobenzene, 1,4-	100-25-4	No	No	-		0	P	-	0	2.20E-03 nc
Dinitrophenol, 2,4-	51-28-5	No	No	-		0	I	-	0	4.39E-02 nc
Dinitrotoluene Mixture, 2,4/2,6-	NA	No	No	1	I	-		0	-	3.77E-03 ca
Dinitrotoluene, 2,4-	121-14-2	No	No	0	C	0	I	0	0	8.27E-03 ca**
Dinitrotoluene, 2,6-	606-20-2	No	No	2	P	0	X	0	0	1.71E-03 ca**
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	No	No	-		0	X	-	0	2.20E-03 nc
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	No	No	-		0	X	-	0	2.20E-03 nc
Dinitrotoluene, Technical grade	25321-14-6	No	No	0	X	0	X	0	0	5.70E-03 ca**
Dinoseb	88-85-7	No	No	-		0	I	-	0	2.20E-02 nc
Dioxane, 1,4-	123-91-1	No	Yes	0	I	0	I	0	1	2.56E-02 ca*
Diphenamid	957-51-7	No	No	-		0	I	-	1	6.59E-01 nc
Diphenyl Ether	101-84-8	No	Yes	-		-		-	-	
Diphenyl Sulfone	127-63-9	No	No	-		0	X	-	0	1.76E-02 nc
Diphenylamine	122-39-4	No	No	-		0	O	-	2	2.20E+00 nc
Diphenylhydrazine, 1,2-	122-66-7	No	No	1	I	-		0	-	3.20E-03 ca
Dipotassium phosphate	7758-11-4	No	No	-		49	P	-	1070	1.07E+03 nc
Diquat	85-00-7	No	No	-		0	I	-	0	4.83E-02 nc
Direct Black 38	1937-37-7	No	No	7	C	-		0	-	3.46E-04 ca
Direct Blue 6	2602-46-2	No	No	7	C	-		0	-	3.46E-04 ca
Direct Brown 95	16071-86-6	No	No	7	C	-		0	-	3.83E-04 ca
Disodium phosphate	7558-79-4	No	No	-		49	P	-	1070	1.07E+03 nc
Disulfoton	298-04-4	No	No	-		0	I	-	0	8.79E-04 nc
Dithiane, 1,4-	505-29-3	No	Yes	-		0	I	-	0	2.20E-01 nc
Diundecyl Phthalate	3648-20-2	No	Yes	-		-		-	-	
Diuron	330-54-1	No	No	-		0	I	-	0	4.39E-02 nc
Dodine	2439-10-3	No	No	-		0	O	-	0	4.39E-01 nc
EPTC	759-94-4	No	Yes	-		0	O	-	1	1.10E+00 nc
Endosulfan	115-29-7	No	Yes	-		0	I	-	0	1.32E-01 nc
Endosulfan Sulfate	1031-07-8	No	No	-		0	P	-	0	1.32E-01 nc
Endothall	145-73-3	No	No	-		0	I	-	0	4.39E-01 nc
Endrin	72-20-8	No	No	-		0	I	-	0	6.59E-03 nc
Epichlorohydrin	106-89-8	No	Yes	0	I	0	P	0	0	1.32E-01 nc
Epoxybutane, 1,2-	106-88-7	No	Yes	-		-		-	-	
Ethanol, 2-(2-methoxyethoxy)-	111-77-3	No	No	-		0	P	-	1	8.79E-01 nc
Ethephon	16672-87-0	No	No	-		0	I	-	0	1.10E-01 nc
Ethion	563-12-2	No	No	-		0	I	-	0	1.10E-02 nc
Ethoxyethanol Acetate, 2-	111-15-9	No	Yes	-		0	P	-	2	2.20E+00 nc
Ethoxyethanol, 2-	110-80-5	No	Yes	-		0	P	-	2	1.98E+00 nc
Ethyl Acetate	141-78-6	No	Yes	-		1	I	-	20	1.98E+01 nc
Ethyl Acrylate	140-88-5	No	Yes	-		0	P	-	0	1.10E-01 nc
Ethyl Chloride	75-00-3	No	Yes	-		-		-	-	
Ethyl Ether	60-29-7	No	Yes	-		0	I	-	4	4.39E+00 nc
Ethyl Methacrylate	97-63-2	No	Yes	-		-		-	-	
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	No	No	-		0	I	-	0	2.20E-04 nc
Ethylbenzene	100-41-4	No	Yes	0	C	0	I	0	2	2.33E-01 ca**
Ethylene Cyanohydrin	109-78-4	No	No	-		0	P	-	2	1.54E+00 nc
Ethylene Diamine	107-15-3	No	Yes	-		0	P	-	2	1.98E+00 nc
Ethylene Glycol	107-21-1	No	No	-		2	I	-	44	4.39E+01 nc
Ethylene Glycol Monobutyl Ether	111-76-2	No	No	-		0	I	-	2	2.20E+00 nc
Ethylene Oxide	75-21-8	Yes	Yes	0	C	-		0	-	8.27E-03 ca
Ethylene Thiourea	96-45-7	No	No	0	C	0	I	0	0	1.76E-03 nc
Ethyleneimine	151-56-4	No	Yes	65	C	-		0	-	3.94E-05 ca
Ethylphthalyl Ethyl Glycolate	84-72-0	No	No	-		3	I	-	66	6.59E+01 nc
Fenamiphos	22224-92-6	No	No	-		0	I	-	0	5.49E-03 nc
Fenpropathrin	39515-41-8	No	No	-		0	I	-	1	5.49E-01 nc
Fenvalerate	51630-58-1	No	No	-		0	I	-	1	5.49E-01 nc
Fluometuron	2164-17-2	No	No	-		0	I	-	0	2.86E-01 nc
Fluoranthene	206-44-0	No	No	-		0	I	-	1	8.79E-01 nc
Fluorene	86-73-7	No	Yes	-		0	I	-	1	8.79E-01 nc
Fluoride	16984-48-8	No	No	-		0	C	-	1	8.79E-01 nc
Fluorine (Soluble Fluoride)	7782-41-4	No	No	-		0	I	-	1	1.32E+00 nc
Fluorobenzene	462-06-6	No	Yes	-		-		-	-	
Fluridone	59756-60-4	No	No	-		0	I	-	2	1.76E+00 nc
Flurprimidol	56425-91-3	No	No	-		0	O	-	1	8.79E-01 nc
Flusilazole	85509-19-9	No	No	-		0	O	-	0	4.39E-02 nc
Flutolanil	66332-96-5	No	No	-		1	O	-	11	1.10E+01 nc
Fluvalinate	69409-94-5	No	No	-		0	I	-	0	2.20E-01 nc
Folpet	133-07-3	No	No	-		0	O	-	2	1.98E+00 nc
Fomesafen	72178-02-0	No	No	-		0	O	-	0	5.49E-02 nc
Fonofos	944-22-9	No	No	-		0	I	-	0	4.39E-02 nc
Formaldehyde	50-00-0	No	Yes	0	C	0	I	0	4	1.22E-01 ca*
Formic Acid	64-18-6	No	Yes	-		1	P	-	20	1.98E+01 nc
Fosetyl-AL	39148-24-8	No	No	-		3	O	-	55	5.49E+01 nc
Furan	110-00-9	No	Yes	-		0	I	-	0	2.20E-02 nc
Furazolidone	67-45-8	No	No	4	H	-		0	-	6.75E-04 ca
Furfural	98-01-1	No	Yes	-		0	I	-	0	6.59E-02 nc
Furium	531-82-8	No	No	2	C	-		0	-	1.71E-03 ca
Furmecyclox	60568-05-0	No	No	0	I	-		0	-	8.54E-02 ca
Gadolinium	7440-54-2	No	No	-		-		-	-	

Glufosinate, Ammonium	77182-82-2	No	No	-		0	O	-	0	1.32E-01 nc
Glutaraldehyde	111-30-8	No	No	-		0	A	-	2	2.20E+00 nc
Glycidyl	765-34-4	No	Yes	-		0	I	-	0	8.79E-03 nc
Glyphosate	1071-83-6	No	No	-		0	I	-	2	2.20E+00 nc
Guanidine	113-00-8	No	Yes	-		0	X	-	0	2.20E-01 nc
Guanidine Chloride	50-01-1	No	No	-		0	P	-	0	4.39E-01 nc
Guanidine Nitrate	506-93-4	No	No	-		0	X	-	1	6.59E-01 nc
Haloxyfop, Methyl	69806-40-2	No	No	-		0	I	-	0	1.10E-03 nc
Heptachlor	76-44-8	No	Yes	5	I	0	I	0	0	5.70E-04 ca*
Heptachlor Epoxide	1024-57-3	No	Yes	9	I	0	I	0	0	2.82E-04 ca**
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	No	Yes	1300	W	0	W	0	0	1.54E-06 nc
Heptanal, n-	111-71-7	No	Yes	-		-		-	-	
Heptane, N-	142-82-5	No	Yes	-		0	X	-	0	6.59E-03 nc
Hexabromobenzene	87-82-1	No	Yes	-		0	I	-	0	4.39E-02 nc
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	No	No	-		0	I	-	0	4.39E-03 nc
Hexachlorobenzene	118-74-1	No	Yes	2	I	0	I	0	0	1.60E-03 ca*
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	No	Yes	3900	W	0	W	0	0	5.13E-07 nc
Hexachlorobutadiene	87-68-3	No	Yes	0	I	0	P	0	0	2.20E-02 nc
Hexachlorocyclohexane, Alpha-	319-84-6	No	No	6	I	0	A	0	0	4.07E-04 ca
Hexachlorocyclohexane, Beta-	319-85-7	No	No	2	I	-		0	-	1.42E-03 ca
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	No	No	1	C	0	I	0	0	2.33E-03 ca**
Hexachlorocyclohexane, Technical	608-73-1	No	No	2	I	-		0	-	1.42E-03 ca
Hexachlorocyclopentadiene	77-47-4	No	Yes	-		0	I	-	0	1.32E-01 nc
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6	No	No	13000	W	0	W	0	0	1.54E-07 nc
Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	No	No	6200	I	-		0	-	4.13E-07 ca
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	No	Yes	13000	W	0	W	0	0	1.54E-07 nc
Hexachloroethane	67-72-1	No	Yes	0	I	0	I	0	0	1.54E-02 nc
Hexachlorophene	70-30-4	No	No	-		0	I	-	0	6.59E-03 nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	No	No	0	I	0	I	0	0	3.20E-02 ca**
Hexamethylene Diisocyanate, 1,6-	822-06-0	No	Yes	-		-		-	-	
Hexamethylene diisocyanate biuret	4035-89-6	No	No	-		-		-	-	
Hexamethylene diisocyanate isocyanurate	3779-63-3	No	No	-		-		-	-	
Hexamethylphosphoramide	680-31-9	No	No	-		0	P	-	0	8.79E-03 nc
Hexane, Commercial	NA	No	Yes	-		-		-	-	
Hexane, N-	110-54-3	No	Yes	-		-		-	-	
Hexanedioic Acid	124-04-9	No	No	-		2	P	-	44	4.39E+01 nc
Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	No	Yes	0	P	0	P	0	2	2.70E-01 ca**
Hexanone, 2-	591-78-6	No	Yes	-		0	I	-	0	1.10E-01 nc
Hexazinone	51235-04-2	No	No	-		0	I	-	1	7.25E-01 nc
Hexythiazox	78587-05-0	No	No	-		0	I	-	1	5.49E-01 nc
HpCDD, 1,2,3,4,6,7,8,-	35822-46-9	No	Yes	1300	W	0	W	0	0	1.54E-06 nc
HpCDF, 1,2,3,4,7,8,9-	55673-89-7	No	Yes	1300	W	0	W	0	0	1.54E-06 nc
HxCDD, 1,2,3,6,7,8-	57653-85-7	No	No	13000	W	0	W	0	0	1.54E-07 nc
HxCDD, 1,2,3,7,8,9-	19408-74-3	No	No	13000	W	0	W	0	0	1.54E-07 nc
HxCDF, 1,2,3,6,7,8-	57117-44-9	No	Yes	13000	W	0	W	0	0	1.54E-07 nc
HxCDF, 1,2,3,7,8,9-	72918-21-9	No	No	13000	W	0	W	0	0	1.54E-07 nc
HxCDF, 2,3,4,6,7,8-	60851-34-5	No	No	13000	W	0	W	0	0	1.54E-07 nc
Hydramethylnon	67485-29-4	No	No	-		0	O	-	0	3.73E-01 nc
Hydrazine	302-01-2	No	Yes	3	I	-		0	-	8.54E-04 ca
Hydrazine Sulfate	10034-93-2	No	No	3	I	-		0	-	8.54E-04 ca
Hydrogen Chloride	7647-01-0	No	Yes	-		-		-	-	
Hydrogen Cyanide	74-90-8	No	Yes	-		0	I	-	0	1.32E-02 nc
Hydrogen Fluoride	7664-39-3	No	Yes	-		0	C	-	1	8.79E-01 nc
Hydrogen Sulfide	7783-06-4	No	Yes	-		-		-	-	
Hydroquinone	123-31-9	No	No	0	P	0	P	0	1	4.27E-02 ca*
Imazalil	35554-44-0	No	No	0	O	0	O	0	0	4.20E-02 ca**
Imazaquin	81335-37-7	No	No	-		0	I	-	5	5.49E+00 nc
Imazethapyr	81335-77-5	No	No	-		3	O	-	55	5.49E+01 nc
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	No	0	E	-		0	-	2.56E-02 ca
Iodine	7553-56-2	No	No	-		0	A	-	0	2.20E-01 nc
Iprodione	36734-19-7	No	No	-		0	I	-	1	8.79E-01 nc
Iron	7439-89-6	No	No	-		1	P	-	15	1.54E+01 nc
Isobutyl Alcohol	78-83-1	No	Yes	-		0	I	-	7	6.59E+00 nc
Isophorone	78-59-1	No	No	0	I	0	I	3	4	2.70E+00 ca**
Isopropalin	33820-53-0	No	Yes	-		0	I	-	0	3.30E-01 nc
Isopropanol	67-63-0	No	Yes	-		2	P	-	44	4.39E+01 nc
Isopropyl Methyl Phosphonic Acid	1832-54-8	No	No	-		0	I	-	2	2.20E+00 nc
Isoxaben	82558-50-7	No	No	-		0	I	-	1	1.10E+00 nc
JP-4	50815-00-4	No	Yes	-		-		-	-	
JP-5	NA	No	Yes	-		-		-	-	
JP-7	NA	No	Yes	-		-		-	-	
JP-8	NA	No	Yes	-		-		-	-	
Kerosene	8008-20-6	No	Yes	-		-		-	-	
Lactofen	77501-63-4	No	No	-		0	O	-	0	1.76E-01 nc
Lactonitrile	78-97-7	No	No	-		0	X	-	0	4.39E-03 nc
Lanthanum	7439-91-0	No	No	-		0	P	-	0	1.10E-03 nc
Lanthanum Acetate Hydrate	100587-90-4	No	No	-		0	P	-	0	4.57E-04 nc
Lanthanum Chloride Heptahydrate	10025-84-0	No	No	-		0	P	-	0	4.11E-04 nc
Lanthanum Chloride, Anhydrous	10099-58-8	No	No	-		0	P	-	0	6.22E-04 nc
Lanthanum Nitrate Hexahydrate	10277-43-7	No	No	-		0	P	-	0	3.52E-04 nc
Lead Phosphate	7446-27-7	No	No	0	C	-		0	-	3.02E-01 ca
Lead acetate	301-04-2	No	No	0	C	-		0	-	1.22E-02 ca
Lead subacetate	1335-32-6	No	No	0	C	-		0	-	6.75E-02 ca
Lewisite	541-25-3	No	Yes	-		0	P	-	0	1.10E-04 nc
Linuron	330-55-2	No	No	-		0	O	-	0	1.69E-01 nc
Lithium	7439-93-2	No	No	-		0	P	-	0	4.39E-02 nc
Lithium Perchlorate	7791-03-9	No	No	-		0	I	-	0	1.54E-02 nc
Lutetium	7439-94-3	No	No	-		-		-	-	
MCPA	94-74-6	No	No	-		0	I	-	0	1.10E-02 nc
MCPB	94-81-5	No	No	-		0	O	-	0	9.67E-02 nc
MCPP	93-65-2	No	No	-		0	I	-	0	2.20E-02 nc
Malathion	121-75-5	No	No	-		0	I	-	0	4.39E-01 nc
Maleic Anhydride	108-31-6	No	No	-		0	I	-	2	2.20E+00 nc

Maleic Hydrazide	123-33-1	No	No	-		1	I	-	11	1.10E+01 nc
Malononitrile	109-77-3	No	No	-		0	P	-	0	2.20E-03 nc
Mancozeb	8018-01-7	No	No	-		0	H	-	1	6.59E-01 nc
Maneb	12427-38-2	No	No	-		0	I	-	0	1.10E-01 nc
Manganese (Diet)	7439-96-5	No	No	-		0	I	-	3	3.08E+00 nc
Mephosfolan	950-10-7	No	No	-		0	H	-	0	1.98E-03 nc
Mepiquat Chloride	24307-26-4	No	No	-		0	I	-	1	6.59E-01 nc
Mercaptobenzothiazole, 2-	149-30-4	No	No	0	P	0	P	0	0	8.79E-02 nc
Mercuric Chloride	7487-94-7	No	No	-		0	I	-	0	6.59E-03 nc
Mercury (elemental)	7439-97-6	No	Yes	-		-		-	-	
Merphos	150-50-5	No	Yes	-		0	I	-	0	6.59E-04 nc
Merphos Oxide	78-48-8	No	No	-		0	O	-	0	2.20E-03 nc
Metalaxyl	57837-19-1	No	No	-		0	I	-	1	1.32E+00 nc
Methacrylonitrile	126-98-7	No	Yes	-		0	I	-	0	2.20E-03 nc
Methamidophos	10265-92-6	No	No	-		0	I	-	0	1.10E-03 nc
Methanol	67-56-1	No	Yes	-		2	I	-	44	4.39E+01 nc
Methidathion	950-37-8	No	No	-		0	O	-	0	3.30E-02 nc
Methomyl	16752-77-5	No	No	-		0	I	-	1	5.49E-01 nc
Methoxy-5-nitroaniline, 2-	99-59-2	No	No	0	C	-		0	-	5.23E-02 ca
Methoxychlor	72-43-5	No	No	-		0	I	-	0	1.10E-01 nc
Methoxyethanol Acetate, 2-	110-49-6	No	Yes	-		0	P	-	0	1.76E-01 nc
Methoxyethanol, 2-	109-86-4	No	Yes	-		0	P	-	0	1.10E-01 nc
Methyl Acetate	79-20-9	No	Yes	-		1	X	-	22	2.20E+01 nc
Methyl Acrylate	96-33-3	No	Yes	-		-		-	-	
Methyl Ethyl Ketone (2-Butanone)	78-93-3	No	Yes	-		1	I	-	13	1.32E+01 nc
Methyl Hydrazine	60-34-4	No	Yes	-		0	P	-	0	2.20E-02 nc
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	No	Yes	-		-		-	-	
Methyl Isocyanate	624-83-9	No	Yes	-		-		-	-	
Methyl Mercury	22967-92-6	No	No	-		0	I	-	0	2.20E-03 nc
Methyl Methacrylate	80-62-6	No	Yes	-		1	I	-	31	3.08E+01 nc
Methyl Parathion	298-00-0	No	No	-		0	I	-	0	5.49E-03 nc
Methyl Phosphonic Acid	993-13-5	No	No	-		0	X	-	1	1.32E+00 nc
Methyl Styrene (Mixed Isomers)	25013-15-4	No	Yes	-		0	H	-	0	1.32E-01 nc
Methyl methanesulfonate	66-27-3	No	No	0	C	-		0	-	2.59E-02 ca
Methyl tert-Butyl Ether (MTBE)	1634-04-4	No	Yes	0	C	-		1	-	1.42E+00 ca
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	No	No	-		0	X	-	0	6.59E-03 nc
Methyl-2-Pentanol, 4-	108-11-2	No	Yes	-		-		-	-	
Methyl-5-Nitroaniline, 2-	99-55-8	No	No	0	P	0	X	0	0	2.85E-01 ca**
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	No	No	8	C	-		0	-	3.09E-04 ca
Methylaniline Hydrochloride, 2-	636-21-5	No	No	0	C	-		0	-	1.97E-02 ca
Methylarsonic acid	124-58-3	No	No	-		0	A	-	0	2.20E-01 nc
Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	No	No	-		0	X	-	0	4.39E-03 nc
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	No	No	0	X	0	X	0	0	6.59E-03 nc
Methylcholanthrene, 3-	56-49-5	Yes	No	22	C	-		0	-	1.17E-04 ca
Methylcyclopentane	96-37-7	No	Yes	-		-		-	-	
Methylene Chloride	75-09-2	Yes	Yes	0	I	0	I	1	0	1.32E-01 nc
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	Yes	No	0	P	0	P	0	0	2.56E-02 ca**
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	No	No	0	I	-		0	-	5.57E-02 ca
Methylenebisbenzenamine, 4,4'-	101-77-9	No	No	2	C	-		0	-	1.60E-03 ca
Methylenediphenyl Diisocyanate	101-68-8	No	No	-		-		-	-	
Methylnaphthalene, 1-	90-12-0	No	Yes	0	P	0	A	0	2	8.84E-02 ca*
Methylnaphthalene, 2-	91-57-6	No	Yes	-		0	I	-	0	8.79E-02 nc
Methylstyrene, Alpha-	98-83-9	No	Yes	-		0	H	-	2	1.54E+00 nc
Metolachlor	51218-45-2	No	No	-		0	I	-	3	3.30E+00 nc
Metribuzin	21087-64-9	No	No	-		0	I	-	1	5.49E-01 nc
Metsulfuron-methyl	74223-64-6	No	No	-		0	I	-	5	5.49E+00 nc
Mineral oils	8012-95-1	No	Yes	-		3	P	-	66	6.59E+01 nc
Mirex	2385-85-5	No	Yes	18	C	0	I	0	0	1.42E-04 ca*
Molinate	2212-67-1	No	No	-		0	I	-	0	4.39E-02 nc
Molybdenum	7439-98-7	No	No	-		0	I	-	0	1.10E-01 nc
Monoaluminum phosphate	13530-50-2	No	No	-		49	P	-	1070	1.07E+03 nc
Monoammonium phosphate	7722-76-1	No	No	-		49	P	-	1070	1.07E+03 nc
Monobutyltin Compounds	NA	No	No	-		-		-	-	
Monocalcium phosphate	7758-23-8	No	No	-		49	P	-	1070	1.07E+03 nc
Monochloramine	10599-90-3	No	No	-		0	I	-	2	2.20E+00 nc
Monomagnesium phosphate	7757-86-0	No	No	-		49	P	-	1070	1.07E+03 nc
Monomethylaniline	100-61-8	No	No	-		0	P	-	0	4.39E-02 nc
Monopotassium phosphate	7778-77-0	No	No	-		49	P	-	1070	1.07E+03 nc
Monosodium phosphate	7558-80-7	No	No	-		49	P	-	1070	1.07E+03 nc
Myclobutanil	88671-89-0	No	No	-		0	I	-	1	5.49E-01 nc
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	No	No	-		0	X	-	0	6.59E-03 nc
Naled	300-76-5	No	Yes	-		0	I	-	0	4.39E-02 nc
Naphtha, High Flash Aromatic (HFAN)	64742-95-6	No	Yes	-		0	X	-	1	6.59E-01 nc
Naphthalene	91-20-3	No	Yes	0	C	0	I	0	0	2.14E-02 ca*
Naphthylamine, 2-	91-59-8	No	No	2	C	-		0	-	1.42E-03 ca
Napropamide	15299-99-7	No	No	-		0	O	-	3	2.64E+00 nc
Neodymium Chloride (Stable, Nonradioactive)	10024-93-8	No	No	-		-		-	-	
Nickel Acetate	373-02-4	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nickel Carbonate	3333-67-3	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nickel Carbonyl	13463-39-3	No	Yes	1	C	0	C	0	0	2.82E-03 ca*
Nickel Hydroxide	12054-48-7	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nickel Oxide	1313-99-1	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nickel Refinery Dust	NA	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nickel Soluble Salts	7440-02-0	No	No	-		0	I	-	0	4.39E-01 nc
Nickel Subsulfide	12035-72-2	No	No	2	C	0	C	0	0	1.51E-03 ca
Nickelocene	1271-28-9	No	No	1	C	0	C	0	0	2.82E-03 ca*
Nitrate (measured as nitrogen)	14797-55-8	No	No	-		2	I	-	35	3.52E+01 nc
Nitrite (measured as nitrogen)	14797-65-0	No	No	-		0	I	-	2	2.20E+00 nc
Nitroaniline, 2-	88-74-4	No	No	-		0	X	-	0	2.20E-01 nc
Nitroaniline, 3-	99-09-2	No	No	-		-		-	-	
Nitroaniline, 4-	100-01-6	No	No	0	P	0	P	0	0	8.79E-02 nc
Nitrobenzene	98-95-3	No	Yes	-		0	I	-	0	4.39E-02 nc
Nitrocellulose	9004-70-0	No	No	-		3000	P	-	65900	6.59E+04 nc
Nitrofurantoin	67-20-9	No	No	-		0	H	-	2	1.54E+00 nc
Nitrofurazone	59-87-0	No	No	1	C	-		0	-	1.97E-03 ca
Nitroglycerin	55-63-0	No	No	0	P	0	P	0	0	2.20E-03 nc
Nitroguanidine	556-88-7	No	No	-		0	I	-	2	2.20E+00 nc
Nitromethane	75-52-5	No	Yes	-		-		-	-	

Nitrophenol, 2-	88-75-5	No	Yes	-		-		-	-	
Nitropropane, 2-	79-46-9	No	Yes	-		-		-	-	
Nitropyrene, 4-	57835-92-4	No	No	1	C	-		0	-	2.14E-03 ca
Nitroso-N-ethylurea, N-	759-73-9	Yes	No	27	C	-		0	-	9.49E-05 ca
Nitroso-N-methylurea, N-	684-93-5	Yes	No	120	C	-		0	-	2.14E-05 ca
Nitroso-di-N-butylamine, N-	924-16-3	No	Yes	5	I	-		0	-	4.75E-04 ca
Nitroso-di-N-propylamine, N-	621-64-7	No	No	7	I	-		0	-	3.66E-04 ca
Nitrosodiethanolamine, N-	1116-54-7	No	No	3	I	-		0	-	9.15E-04 ca
Nitrosodiethylamine, N-	55-18-5	Yes	No	150	I	-		0	-	1.71E-05 ca
Nitrosodimethylamine, N-	62-75-9	Yes	Yes	51	I	0	P	0	0	5.03E-05 ca**
Nitrosodiphenylamine, N-	86-30-6	No	No	0	I	-		1	-	5.23E-01 ca
Nitrosomethylethylamine, N-	10595-95-6	No	Yes	22	I	-		0	-	1.17E-04 ca
Nitrosomorpholine [N-]	59-89-2	No	No	7	C	-		0	-	3.83E-04 ca
Nitrosopiperidine [N-]	100-75-4	No	No	9	C	-		0	-	2.73E-04 ca
Nitrosopyrrolidine, N-	930-55-2	No	No	2	I	-		0	-	1.22E-03 ca
Nitrotoluene, m-	99-08-1	No	No	-		0	X	-	0	2.20E-03 nc
Nitrotoluene, o-	88-72-2	No	Yes	0	P	0	P	0	0	1.17E-02 ca**
Nitrotoluene, p-	99-99-0	No	No	0	P	0	P	0	0	8.79E-02 nc
Nonane, n-	111-84-2	No	Yes	-		0	X	-	0	6.59E-03 nc
Norflurazon	27314-13-2	No	No	-		0	O	-	0	3.30E-01 nc
OCDD	3268-87-9	No	No	39	W	0	W	0	0	5.13E-05 nc
OCDF	39001-02-0	No	No	39	W	0	W	0	0	5.13E-05 nc
Octabromodiphenyl Ether	32536-52-0	No	No	-		0	I	-	0	6.59E-02 nc
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	No	No	-		0	I	-	1	1.10E+00 nc
Octamethylpyrophosphoramide	152-16-9	No	No	-		0	H	-	0	4.39E-02 nc
Octyl Phthalate, di-N-	117-84-0	No	No	-		0	P	-	0	2.20E-01 nc
Oryzalin	19044-88-3	No	No	0	O	0	O	0	3	3.29E-01 ca**
Oxadiazon	19666-30-9	No	No	-		0	I	-	0	1.10E-01 nc
Oxamyl	23135-22-0	No	No	-		0	I	-	1	5.49E-01 nc
Oxyfluorfen	42874-03-3	No	No	0	O	0	O	0	1	3.50E-02 ca*
Paclobutrazol	76738-62-0	No	No	-		0	I	-	0	2.86E-01 nc
Paraquat Dichloride	1910-42-5	No	No	-		0	I	-	0	9.89E-02 nc
Parathion	56-38-2	No	No	-		0	H	-	0	1.32E-01 nc
PeCDF, 1,2,3,7,8-	57117-41-6	No	No	3900	W	0	W	0	0	5.13E-07 nc
PeCDF, 2,3,4,7,8-	57117-31-4	No	No	39000	W	0	W	0	0	5.13E-08 nc
Pebulate	1114-71-2	No	Yes	-		0	H	-	1	1.10E+00 nc
Pendimethalin	40487-42-1	No	No	-		0	O	-	7	6.59E+00 nc
Pentabromodiphenyl Ether	32534-81-9	No	Yes	-		0	I	-	0	4.39E-02 nc
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	No	No	-		0	I	-	0	2.20E-03 nc
Pentachlorobenzene	608-93-5	No	Yes	-		0	I	-	0	1.76E-02 nc
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	No	Yes	4	W	0	W	0	0	5.13E-04 nc
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	No	Yes	13000	W	0	W	0	0	1.54E-07 nc
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	No	No	130000	W	0	W	0	0	1.54E-08 nc
Pentachloroethane	76-01-7	No	Yes	0	P	-		0	-	2.85E-02 ca
Pentachloronitrobenzene	82-68-8	No	Yes	0	H	0	I	0	0	9.86E-03 ca**
Pentachlorophenol	87-86-5	No	No	0	I	0	I	0	0	6.41E-03 ca*
Pentaerythritol tetranitrate (PETN)	78-11-5	No	No	0	X	0	P	1	0	4.39E-02 nc
Pentane, n-	109-66-0	No	Yes	-		-		-	-	
Perchlorate and Perchlorate Salts	14797-73-0	No	No	-		0	I	-	0	1.54E-02 nc
Perfluorobutane sulfonic acid (PFBS)	375-73-5	No	No	-		0	P	-	0	4.39E-01 nc
Perfluorobutanesulfonate	45187-15-3	No	No	-		0	P	-	0	4.39E-01 nc
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	-		0	D	-	0	4.39E-04 nc
Perfluorooctanesulfonate	45298-90-6	No	No	-		0	D	-	0	4.39E-04 nc
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	0	D	0	D	0	0	4.39E-04 nc
Permethrin	52645-53-1	No	No	-		0	I	-	1	1.10E+00 nc
Phenacetin	62-44-2	No	No	0	C	-		1	-	1.17E+00 ca
Phenmedipham	13684-63-4	No	No	-		0	O	-	5	5.27E+00 nc
Phenol	108-95-2	No	No	-		0	I	-	7	6.59E+00 nc
Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	No	No	-		0	I	-	0	8.79E-02 nc
Phenothiazine	92-84-2	No	No	-		0	X	-	0	1.10E-02 nc
Phenyl Isothiocyanate	103-72-0	No	Yes	-		0	X	-	0	4.39E-03 nc
Phenylenediamine, m-	108-45-2	No	No	-		0	I	-	0	1.32E-01 nc
Phenylenediamine, o-	95-54-5	No	No	0	P	0	P	0	0	2.14E-02 ca**
Phenylenediamine, p-	106-50-3	No	No	-		0	X	-	0	2.20E-02 nc
Phenylmercuric Acetate	62-38-4	No	No	-		0	I	-	0	1.76E-03 nc
Phenylphenol, 2-	90-43-7	No	No	0	H	-		1	-	1.32E+00 ca
Phorate	298-02-2	No	No	-		0	H	-	0	4.39E-03 nc
Phosmet	732-11-6	No	No	-		0	I	-	0	4.39E-01 nc
Phosphine	7803-51-2	No	Yes	-		0	I	-	0	6.59E-03 nc
Phosphoric Acid	7664-38-2	No	No	-		49	P	-	1070	1.07E+03 nc
Phosphorus, White	7723-14-0	No	Yes	-		0	I	-	0	4.39E-04 nc
Phthalic Acid, P-	100-21-0	No	No	-		1	H	-	22	2.20E+01 nc
Phthalic Anhydride	85-44-9	No	No	-		2	I	-	44	4.39E+01 nc
Picloram	1918-02-1	No	No	-		0	I	-	2	1.54E+00 nc
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	No	No	-		0	X	-	0	2.20E-03 nc
Picric Acid (2,4,6-Trinitrophenol)	88-89-1	No	No	-		0	X	-	0	1.98E-02 nc
Pirimiphos, Methyl	29232-93-7	No	No	-		0	O	-	0	1.54E-03 nc
Polybrominated Biphenyls	36355-01-8	No	No	30	C	0	H	0	0	8.54E-05 ca**
Polychlorinated Biphenyls (high risk)	1336-36-3	No	Yes	2	I	-		0	-	1.28E-03 ca
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	No	No	-		-		-	-	
Polyphosphoric acid	8017-16-1	No	No	-		49	P	-	1070	1.07E+03 nc
Potassium Cyanide	151-50-8	No	No	-		0	I	-	0	4.39E-02 nc
Potassium Perchlorate	7778-74-7	No	No	-		0	I	-	0	1.54E-02 nc
Potassium Perfluorobutane Sulfonate	29420-49-3	No	No	-		0	P	-	0	4.39E-01 nc
Potassium Perfluorooctane Sulfonate	2795-39-3	No	No	-		0	D	-	0	4.39E-04 nc
Potassium Silver Cyanide	506-61-6	No	No	-		0	I	-	0	1.10E-01 nc
Potassium tripolyphosphate	13845-36-8	No	No	-		49	P	-	1070	1.07E+03 nc
Praseodymium Chloride (Stable, Nonradioactive)	10361-79-2	No	No	-		-		-	-	
Prochloraz	67747-09-5	No	No	0	I	0	I	0	0	1.71E-02 ca*
Profluralin	26399-36-0	No	Yes	-		0	H	-	0	1.32E-01 nc
Prometon	1610-18-0	No	No	-		0	I	-	0	3.30E-01 nc
Prometryn	7287-19-6	No	No	-		0	O	-	1	8.79E-01 nc
Pronamide	23950-58-5	No	No	-		0	I	-	2	1.65E+00 nc
Propachlor	1918-16-7	No	No	-		0	I	-	0	2.86E-01 nc
Propanil	709-98-8	No	No	-		0	I	-	0	1.10E-01 nc

Propargite	2312-35-8	No	No	0	O	0	O	0	1	1.34E-02 ca*
Propargyl Alcohol	107-19-7	No	Yes	-		0	I	-	0	4.39E-02 nc
Propazine	139-40-2	No	No	-		0	I	-	0	4.39E-01 nc
Propham	122-42-9	No	No	-		0	I	-	0	4.39E-01 nc
Propiconazole	60207-90-1	No	No	-		0	O	-	2	2.20E+00 nc
Propionaldehyde	123-38-6	No	Yes	-		-		-	-	
Propyl benzene	103-65-1	No	Yes	-		0	X	-	2	2.20E+00 nc
Propylene	115-07-1	No	Yes	-		-		-	-	
Propylene Glycol	57-55-6	No	No	-		20	P	-	439	4.39E+02 nc
Propylene Glycol Dinitrate	6423-43-4	No	No	-		-		-	-	
Propylene Glycol Monomethyl Ether	107-98-2	No	Yes	-		1	H	-	15	1.54E+01 nc
Propylene Oxide	75-56-9	No	Yes	0	I	-		0	-	1.07E-02 ca
Pyrene	129-00-0	No	Yes	-		0	I	-	1	6.59E-01 nc
Pyridine	110-86-1	No	Yes	-		0	I	-	0	2.20E-02 nc
Quinalphos	13593-03-8	No	No	-		0	I	-	0	1.10E-02 nc
Quinoline	91-22-5	No	No	3	I	-		0	-	8.54E-04 ca
Quizalofop-ethyl	76578-14-8	No	No	-		0	I	-	0	1.98E-01 nc
Resmethrin	10453-86-8	No	No	-		0	I	-	1	6.59E-01 nc
Ronnel	299-84-3	No	Yes	-		0	H	-	1	1.10E+00 nc
Rotenone	83-79-4	No	No	-		0	I	-	0	8.79E-02 nc
Rubidium	7440-17-7	No	No	-		-		-	-	
Rubidium Chloride	7791-11-9	No	No	-		-		-	-	
Rubidium Hydroxide	1310-82-3	No	No	-		-		-	-	
Rubidium Iodide	7790-29-6	No	No	-		-		-	-	
Safrole	94-59-7	Yes	No	0	C	-		0	-	1.17E-02 ca
Samarium Chloride (Stable, Nonradioactive)	10361-82-7	No	No	-		-		-	-	
Samarium Nitrate (Stable, Nonradioactive)	10361-83-8	No	No	-		-		-	-	
Selenious Acid	7783-00-8	No	No	-		0	I	-	0	1.10E-01 nc
Selenium	7782-49-2	No	No	-		0	I	-	0	1.10E-01 nc
Selenium Sulfide	7446-34-6	No	No	-		0	C	-	0	1.10E-01 nc
Sethoxydim	74051-80-2	No	No	-		0	O	-	3	3.08E+00 nc
Silica (crystalline, respirable)	7631-86-9	No	No	-		-		-	-	
Silver	7440-22-4	No	No	-		0	I	-	0	1.10E-01 nc
Silver Cyanide	506-64-9	No	No	-		0	I	-	2	2.20E+00 nc
Simazine	122-34-9	No	No	0	H	0	I	0	0	2.14E-02 ca**
Sodium Acifluorfen	62476-59-9	No	No	-		0	I	-	0	2.86E-01 nc
Sodium Azide	26628-22-8	No	No	-		0	I	-	0	8.79E-02 nc
Sodium Cyanide	143-33-9	No	No	-		0	I	-	0	2.20E-02 nc
Sodium Diethyldithiocarbamate	148-18-5	No	No	0	H	0	I	0	1	9.49E-03 ca*
Sodium Fluoride	7681-49-4	No	No	-		0	A	-	1	1.10E+00 nc
Sodium Fluoroacetate	62-74-8	No	No	-		0	I	-	0	4.39E-04 nc
Sodium Metavanadate	13718-26-8	No	No	-		0	H	-	0	2.20E-02 nc
Sodium Perchlorate	7601-89-0	No	No	-		0	I	-	0	1.54E-02 nc
Sodium Tungstate	13472-45-2	No	No	-		0	P	-	0	1.76E-02 nc
Sodium Tungstate Dihydrate	10213-10-2	No	No	-		0	P	-	0	1.76E-02 nc
Sodium acid pyrophosphate	7758-16-9	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium aluminum phosphate (acidic)	7785-88-8	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium aluminum phosphate (anhydrous)	10279-59-1	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium aluminum phosphate (tetrahydrate)	10305-76-7	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium hexametaphosphate	10124-56-8	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium polyphosphate	68915-31-1	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium trimetaphosphate	7785-84-4	No	No	-		49	P	-	1070	1.07E+03 nc
Sodium tripolyphosphate	7758-29-4	No	No	-		49	P	-	1070	1.07E+03 nc
Stirofos (Tetrachlorovinphos)	961-11-5	No	No	0	H	0	I	0	1	1.07E-01 ca**
Strontium, Stable	7440-24-6	No	No	-		1	I	-	13	1.32E+01 nc
Strychnine	57-24-9	No	No	-		0	I	-	0	6.59E-03 nc
Styrene	100-42-5	No	Yes	-		0	I	-	4	4.39E+00 nc
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	No	No	-		0	P	-	0	6.59E-02 nc
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	No	No	-		0	P	-	0	6.59E-02 nc
Sulfolane	126-33-0	No	No	-		0	P	-	0	2.20E-02 nc
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	No	No	-		0	P	-	0	1.76E-02 nc
Sulfur Mustard	505-60-2	No	Yes	-		-		-	-	
Sulfur Trioxide	7446-11-9	No	Yes	-		-		-	-	
Sulfuric Acid	7664-93-9	No	No	-		-		-	-	
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	No	No	0	I	0	H	0	1	1.03E-01 ca*
TCDD, 2,3,7,8-	1746-01-6	No	Yes	130000	C	0	I	0	0	1.54E-08 nc
TCDF, 2,3,7,8-	51207-31-9	No	Yes	13000	W	0	W	0	0	1.54E-07 nc
TCMTB	21564-17-0	No	No	-		0	H	-	1	6.59E-01 nc
Tebuthiuron	34014-18-1	No	No	-		0	I	-	2	1.54E+00 nc
Temephos	3383-96-8	No	No	-		0	H	-	0	4.39E-01 nc
Terbacil	5902-51-2	No	No	-		0	I	-	0	2.86E-01 nc
Terbufos	13071-79-9	No	Yes	-		0	H	-	0	5.49E-04 nc
Terbutryn	886-50-0	No	No	-		0	I	-	0	2.20E-02 nc
Tert-Butyl Acetate	540-88-5	No	Yes	0	C	-		1	-	5.13E-01 ca
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	No	No	-		0	I	-	0	2.20E-03 nc
Tetrachlorobenzene, 1,2,4,5-	95-94-3	No	Yes	-		0	I	-	0	6.59E-03 nc
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	No	No	13	W	0	W	0	0	1.54E-04 nc
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	No	Yes	39	W	0	W	0	0	5.13E-05 nc
Tetrachloroethane, 1,1,1,2-	630-20-6	No	Yes	0	I	0	I	0	1	9.86E-02 ca**
Tetrachloroethane, 1,1,2,2-	79-34-5	No	Yes	0	I	0	I	0	0	1.28E-02 ca*
Tetrachloroethylene	127-18-4	No	Yes	0	I	0	I	1	0	1.32E-01 nc
Tetrachlorophenol, 2,3,4,6-	58-90-2	No	No	-		0	I	-	1	6.59E-01 nc
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	No	Yes	16	X	0	X	0	0	1.60E-04 ca**
Tetraethyl Dithiopyrophosphate	3689-24-5	No	No	-		0	I	-	0	1.10E-02 nc
Tetraethyl Lead	78-00-2	No	Yes	-		0	I	-	0	2.20E-06 nc
Tetrafluoroethane, 1,1,1,2-	811-97-2	No	Yes	-		-		-	-	
Tetrahydrofuran	109-99-9	No	Yes	-		1	I	-	20	1.98E+01 nc
Tetramethylcyclohexane	30501-43-0	No	Yes	-		-		-	-	
Tetrapotassium phosphate	7320-34-5	No	No	-		49	P	-	1070	1.07E+03 nc
Tetrasodium pyrophosphate	7722-88-5	No	No	-		49	P	-	1070	1.07E+03 nc
Tetryl (Trinitrophenylmethylnitramine)	479-45-8	No	No	-		0	P	-	0	4.39E-02 nc
Thallic Oxide	1314-32-5	No	No	-		0	G	-	0	4.39E-04 nc
Thallium (I) Nitrate	10102-45-1	No	No	-		0	X	-	0	2.20E-04 nc
Thallium (Soluble Salts)	7440-28-0	No	No	-		0	X	-	0	2.20E-04 nc
Thallium Acetate	563-68-8	No	Yes	-		0	X	-	0	2.20E-04 nc
Thallium Carbonate	6533-73-9	No	Yes	-		0	X	-	0	4.39E-04 nc
Thallium Chloride	7791-12-0	No	No	-		0	X	-	0	2.20E-04 nc

Thallium Selenite	12039-52-0	No	No	-		0	G	-	0	2.20E-04 nc
Thallium Sulfate	7446-18-6	No	No	-		0	X	-	0	4.39E-04 nc
Thifensulfuron-methyl	79277-27-3	No	No	-		0	O	-	1	9.45E-01 nc
Thiobencarb	28249-77-6	No	No	-		0	I	-	0	2.20E-01 nc
Thiocyanates	NA	No	No	-		0	P	-	0	4.39E-03 nc
Thiocyanic Acid	463-56-9	No	Yes	-		0	X	-	0	4.39E-03 nc
Thiodiglycol	111-48-8	No	No	-		0	X	-	2	1.54E+00 nc
Thiofanox	39196-18-4	No	No	-		0	H	-	0	6.59E-03 nc
Thiophanate, Methyl	23564-05-8	No	No	0	O	0	O	0	1	2.21E-01 ca**
Thiram	137-26-8	No	No	-		0	O	-	0	3.30E-01 nc
Tin	7440-31-5	No	No	-		1	H	-	13	1.32E+01 nc
Titanium Tetrachloride	7550-45-0	No	Yes	-		-		-	-	
Toluene	108-88-3	No	Yes	-		0	I	-	2	1.76E+00 nc
Toluene-2,4-diisocyanate	584-84-9	No	Yes	0	C	-		0	-	6.57E-02 ca
Toluene-2,5-diamine	95-70-5	No	No	0	X	0	X	0	0	4.39E-03 nc
Toluene-2,6-diisocyanate	91-08-7	No	Yes	0	C	-		0	-	6.57E-02 ca
Toluic Acid, p-	99-94-5	No	No	-		0	P	-	0	1.10E-01 nc
Toluidine, o- (Methylaniline, 2-)	95-53-4	No	No	0	P	-		0	-	1.60E-01 ca
Toluidine, p-	106-49-0	No	No	0	P	0	X	0	0	8.54E-02 ca**
Total Petroleum Hydrocarbons (Aliphatic High)	NA	No	Yes	-		3	P	-	66	6.59E+01 nc
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	No	Yes	-		-		-	-	
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	No	Yes	-		0	X	-	0	2.20E-01 nc
Total Petroleum Hydrocarbons (Aromatic High)	NA	No	No	-		0	P	-	1	8.79E-01 nc
Total Petroleum Hydrocarbons (Aromatic Low)	NA	No	Yes	-		0	P	-	0	8.79E-02 nc
Total Petroleum Hydrocarbons (Aromatic Medium)	NA	No	Yes	-		0	P	-	0	8.79E-02 nc
Toxaphene	8001-35-2	No	No	1	I	0	P	0	0	1.98E-03 nc
Toxaphene, Weathered	NA	No	No	-		0	X	-	0	6.59E-04 nc
Tralomethrin	66841-25-6	No	No	-		0	I	-	0	1.65E-01 nc
Tri-n-butyltin	688-73-3	No	Yes	-		0	A	-	0	6.59E-03 nc
Triacetin	102-76-1	No	No	-		80	X	-	1760	1.76E+03 nc
Triadimefon	43121-43-3	No	No	-		0	O	-	1	7.47E-01 nc
Triallate	2303-17-5	No	Yes	0	O	0	O	0	1	3.57E-02 ca*
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	No	No	-		49	P	-	1070	1.07E+03 nc
Triasulfuron	82097-50-5	No	No	-		0	I	-	0	2.20E-01 nc
Tribenuron-methyl	101200-48-0	No	No	-		0	I	-	0	1.76E-01 nc
Tribromobenzene, 1,2,4-	615-54-3	No	Yes	-		0	I	-	0	1.10E-01 nc
Tribromophenol, 2,4,6-	118-79-6	No	No	-		0	X	-	0	1.98E-01 nc
Tributyl Phosphate	126-73-8	No	No	0	P	0	P	0	0	2.20E-01 nc
Tributyltin Compounds	NA	No	No	-		0	P	-	0	6.59E-03 nc
Tributyltin Oxide	56-35-9	No	No	-		0	I	-	0	6.59E-03 nc
Tricalcium phosphate	7758-87-4	No	No	-		49	P	-	1070	1.07E+03 nc
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	No	Yes	-		30	I	-	659	6.59E+02 nc
Trichloro-2'-hydroxydiphenylether	3380-34-5	No	No	-		-		-	-	
Trichloroacetic Acid	76-03-9	No	No	0	I	0	I	0	0	3.66E-02 ca*
Trichloroaniline HCl, 2,4,6-	33663-50-2	No	No	0	H	-		0	-	8.84E-02 ca
Trichloroaniline, 2,4,6-	634-93-5	No	No	0	X	0	X	0	0	6.59E-04 nc
Trichlorobenzene, 1,2,3-	87-61-6	No	Yes	-		0	X	-	0	1.76E-02 nc
Trichlorobenzene, 1,2,4-	120-82-1	No	Yes	0	P	0	I	0	0	8.84E-02 ca**
Trichloroethane, 1,1,1-	71-55-6	No	Yes	-		2	I	-	44	4.39E+01 nc
Trichloroethane, 1,1,2-	79-00-5	No	Yes	0	I	0	I	0	0	4.50E-02 ca**
Trichloroethylene	79-01-6	Yes	Yes	0	I	0	I	0	0	1.10E-02 nc
Trichlorofluoromethane	75-69-4	No	Yes	-		0	I	-	7	6.59E+00 nc
Trichlorophenol, 2,4,5-	95-95-4	No	No	-		0	I	-	2	2.20E+00 nc
Trichlorophenol, 2,4,6-	88-06-2	No	No	0	I	0	P	0	0	2.20E-02 nc
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	No	No	-		0	I	-	0	2.20E-01 nc
Trichlorophenoxypropionic acid, -2,4,5	93-72-1	No	No	-		0	I	-	0	1.76E-01 nc
Trichloropropane, 1,1,2-	598-77-6	No	Yes	-		0	I	-	0	1.10E-01 nc
Trichloropropane, 1,2,3-	96-18-4	Yes	Yes	30	I	0	I	0	0	8.54E-05 ca
Trichloropropene, 1,2,3-	96-19-5	No	Yes	-		0	X	-	0	6.59E-02 nc
Tricresyl Phosphate (TCP)	1330-78-5	No	No	-		0	A	-	0	4.39E-01 nc
Tridiphane	58138-08-2	No	No	-		0	I	-	0	6.59E-02 nc
Triethylamine	121-44-8	No	Yes	-		-		-	-	
Triethylene Glycol	112-27-6	No	No	-		2	P	-	44	4.39E+01 nc
Trifluoroethane, 1,1,1-	420-46-2	No	Yes	-		-		-	-	
Trifluralin	1582-09-8	No	Yes	0	I	0	I	0	0	1.65E-01 nc
Trimagnesium phosphate	7757-87-1	No	No	-		49	P	-	1070	1.07E+03 nc
Trimethyl Phosphate	512-56-1	No	No	0	P	0	P	0	0	1.28E-01 ca**
Trimethylbenzene, 1,2,3-	526-73-8	No	Yes	-		0	I	-	0	2.20E-01 nc
Trimethylbenzene, 1,2,4-	95-63-6	No	Yes	-		0	I	-	0	2.20E-01 nc
Trimethylbenzene, 1,3,5-	108-67-8	No	Yes	-		0	I	-	0	2.20E-01 nc
Trimethylpentene, 2,4,4-	25167-70-8	No	Yes	-		0	X	-	0	2.20E-01 nc
Trinitrobenzene, 1,3,5-	99-35-4	No	No	-		0	I	-	1	6.59E-01 nc
Trinitrotoluene, 2,4,6-	118-96-7	No	No	0	I	0	I	0	0	1.10E-02 nc
Triphenylphosphine Oxide	791-28-6	No	No	-		0	P	-	0	4.39E-01 nc
Tripotassium phosphate	7778-53-2	No	No	-		49	P	-	1070	1.07E+03 nc
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	No	No	-		0	A	-	0	4.39E-01 nc
Tris(1-chloro-2-propyl)phosphate	13674-84-5	No	No	-		0	X	-	0	2.20E-01 nc
Tris(2,3-dibromopropyl)phosphate	126-72-7	No	Yes	2	C	-		0	-	1.11E-03 ca
Tris(2-chloroethyl)phosphate	115-96-8	No	No	0	P	0	P	0	0	1.28E-01 ca**
Tris(2-ethylhexyl)phosphate	78-42-2	No	No	0	P	0	P	1	2	8.01E-01 ca**
Trisbutoxyethyl Phosphate	78-51-3	No	No	-		-		-	-	
Trisodium phosphate	7601-54-9	No	No	-		49	P	-	1070	1.07E+03 nc
Tungsten	7440-33-7	No	No	-		0	P	-	0	1.76E-02 nc
Uranium	NA	No	No	-		0	A	-	0	4.39E-03 nc
Urethane	51-79-6	Yes	No	1	C	-		0	-	2.56E-03 ca
Vanadium Pentoxide	1314-62-1	No	No	-		0	I	-	0	1.98E-01 nc
Vanadium and Compounds	7440-62-2	No	No	-		0	G	-	0	1.11E-01 nc
Vernolate	1929-77-7	No	Yes	-		0	I	-	0	2.20E-02 nc
Vinclozolin	50471-44-8	No	No	-		0	O	-	0	2.64E-02 nc
Vinyl Acetate	108-05-4	No	Yes	-		1	H	-	22	2.20E+01 nc
Vinyl Bromide	593-60-2	No	Yes	-		-		-	-	
Vinyl Chloride	75-01-4	Yes	Yes	1	I	0	I	0	0	3.56E-03 ca*
Warfarin	81-81-2	No	No	-		0	I	-	0	6.59E-03 nc
Xylene, m-	108-38-3	No	Yes	-		0	G	-	4	4.39E+00 nc
Xylene, o-	95-47-6	No	Yes	-		0	G	-	4	4.39E+00 nc
Xylene, p-	106-42-3	No	Yes	-		0	G	-	4	4.39E+00 nc
Xylenes	1330-20-7	No	Yes	-		0	I	-	4	4.39E+00 nc
Zinc Cyanide	557-21-1	No	No	-		0	I	-	1	1.10E+00 nc

Zinc Phosphide	1314-84-7	No	No	-		0	I	-	0	6.59E-03 nc
Zinc and Compounds	7440-66-6	No	No	-		0	I	-	7	6.59E+00 nc
Zineb	12122-67-7	No	No	-		0	I	-	1	1.10E+00 nc
Zirconium	7440-67-7	No	No	-		0	X	-	0	1.76E-03 nc

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Site-specific

Fish Equation Inputs for Fish

* Inputted values different from Fish defaults are highlighted.

Variable	Fish Fish Default Value	Form-input Value
AT (averaging time)	365	365
BW_{res-a} (body weight) kg	80	80
ED_{res} (exposure duration) yr	26	26
EF_{res-a} (exposure frequency) days/yr	350	350
THQ (target hazard quotient) unitless	0.1	0.1
$IRFI_{res-a}$ (fish consumption rate - adult) mg/day		125969
LT (lifetime) yr	70	70
TR (target cancer risk) unitless	0.000001	0.000001

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Site-specific

Fish Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	SF_o(mg/kg-day)$^{-1}$	SF_oRef	RfD (mg/kg-day)	RfD Ref	Ingestion SL TR=1E-06 (mg/kg)	Ingestion SL THQ=0.1 (mg/kg)	Screening Level (mg/kg)
Acenaphthene	83-32-9	No	Yes	-		0	I	-	4	3.97E+00 nc
Acephate	30560-19-1	No	No	-		0	O	-	0	7.95E-02 nc
Acetaldehyde	75-07-0	No	Yes	-		-		-	-	
Acetochlor	34256-82-1	No	No	-		0	I	-	1	1.32E+00 nc
Acetone	67-64-1	No	Yes	-		1	I	-	60	5.96E+01 nc
Acetone Cyanohydrin	75-86-5	No	No	-		-		-	-	
Acetonitrile	75-05-8	No	Yes	-		-		-	-	
Acetophenone	98-86-2	No	Yes	-		0	I	-	7	6.62E+00 nc
Acetylaminofluorene, 2-	53-96-3	No	No	4	C	-		0	-	4.69E-04 ca
Acrolein	107-02-8	No	Yes	-		0	I	-	0	3.31E-02 nc
Acrylamide	79-06-1	Yes	No	1	I	0	I	0	0	3.57E-03 ca*
Acrylic Acid	79-10-7	No	Yes	-		1	I	-	33	3.31E+01 nc
Acrylonitrile	107-13-1	No	Yes	1	I	0	A	0	3	3.30E-03 ca
Adiponitrile	111-69-3	No	No	-		-		-	-	
Alachlor	15972-60-8	No	No	0	C	0	I	0	1	3.18E-02 ca*
Aldicarb	116-06-3	No	No	-		0	I	-	0	6.62E-02 nc
Aldicarb Sulfone	1646-88-4	No	No	-		0	I	-	0	6.62E-02 nc
Aldrin	309-00-2	No	Yes	17	I	0	I	0	0	1.05E-04 ca*
Allyl Alcohol	107-18-6	No	Yes	-		0	I	-	0	3.31E-01 nc
Allyl Chloride	107-05-1	No	Yes	0	C	-		0	-	8.49E-02 ca
Aluminum	7429-90-5	No	No	-		1	P	-	66	6.62E+01 nc
Aluminum Phosphide	20859-73-8	No	No	-		0	I	-	0	2.65E-02 nc
Aluminum metaphosphate	13776-88-0	No	No	-		49	P	-	3220	3.22E+03 nc
Ametryn	834-12-8	No	No	-		0	I	-	1	5.96E-01 nc
Aminobiphenyl, 4-	92-67-1	No	No	21	C	-		0	-	8.49E-05 ca
Aminophenol, m-	591-27-5	No	No	-		0	P	-	5	5.30E+00 nc
Aminophenol, o-	95-55-6	No	No	-		0	X	-	0	2.65E-01 nc
Aminophenol, p-	123-30-8	No	No	-		0	P	-	1	1.32E+00 nc
Amitraz	33089-61-1	No	No	-		0	I	-	0	1.66E-01 nc
Ammonium Perchlorate	7790-98-9	No	No	-		0	I	-	0	4.64E-02 nc
Ammonium Sulfamate	7773-06-0	No	No	-		0	I	-	13	1.32E+01 nc
Ammonium polyphosphate	68333-79-9	No	No	-		49	P	-	3220	3.22E+03 nc
Amyl Alcohol, tert-	75-85-4	No	Yes	-		-		-	-	
Aniline	62-53-3	No	No	0	I	0	P	0	0	3.13E-01 ca**
Anthracene	120-12-7	No	Yes	-		0	I	-	20	1.99E+01 nc
Anthraquinone, 9,10-	84-65-1	No	No	0	P	0	X	0	0	4.46E-02 ca**
Antimony (metallic)	7440-36-0	No	No	-		0	I	-	0	2.65E-02 nc
Antimony Pentoxide	1314-60-9	No	No	-		0	H	-	0	3.31E-02 nc
Antimony Potassium Tartrate	11071-15-1	No	No	-		-		-	-	
Antimony Tetroxide	1332-81-6	No	No	-		0	H	-	0	2.65E-02 nc
Antimony Trichloride	10025-91-9	No	No	-		-		-	-	
Antimony Trioxide	1309-64-4	No	No	-		-		-	-	
Aroclor 1016	12674-11-2	No	Yes	0	G	0	I	0	0	4.64E-03 nc
Aroclor 1221	11104-28-2	No	Yes	2	G	-		0	-	8.92E-04 ca
Aroclor 1232	11141-16-5	No	Yes	2	G	-		0	-	8.92E-04 ca
Aroclor 1242	53469-21-9	No	Yes	2	G	-		0	-	8.92E-04 ca
Aroclor 1248	12672-29-6	No	Yes	2	G	-		0	-	8.92E-04 ca
Aroclor 1254	11097-69-1	No	Yes	2	G	0	I	0	0	8.92E-04 ca**
Aroclor 1260	11096-82-5	No	Yes	2	G	-		0	-	8.92E-04 ca
Aroclor 5460	11126-42-4	No	Yes	-		0	X	-	0	3.97E-02 nc
Arsenic, Inorganic	7440-38-2	No	No	2	I	0	I	0	0	1.19E-03 ca*
Arsine	7784-42-1	No	No	-		0	C	-	0	2.32E-04 nc
Asulam	3337-71-1	No	No	-		0	O	-	2	2.38E+00 nc
Atrazine	1912-24-9	No	No	0	C	0	I	0	2	7.75E-03 ca
Auramine	492-80-8	No	No	1	C	-		0	-	2.03E-03 ca
Avermectin B1	65195-55-3	No	No	-		0	I	-	0	2.65E-02 nc
Azinphos-methyl	86-50-0	No	No	-		0	A	-	0	1.99E-01 nc
Azobenzene	103-33-3	No	Yes	0	I	-		0	-	1.62E-02 ca
Azodicarbonamide	123-77-3	No	No	-		1	P	-	66	6.62E+01 nc
Barium	7440-39-3	No	No	-		0	I	-	13	1.32E+01 nc
Benfluralin	1861-40-1	No	Yes	-		0	O	-	0	3.31E-01 nc
Benomyl	17804-35-2	No	No	-		0	I	-	3	3.31E+00 nc
Bensulfuron-methyl	83055-99-6	No	No	-		0	I	-	13	1.32E+01 nc
Bentazon	25057-89-0	No	No	-		0	I	-	2	1.99E+00 nc
Benz[a]anthracene	56-55-3	Yes	Yes	0	E	-		0	-	1.78E-02 ca
Benzaldehyde	100-52-7	No	Yes	0	P	0	I	0	7	4.46E-01 ca*
Benzene	71-43-2	No	Yes	0	I	0	I	0	0	3.24E-02 ca**
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	No	No	0	X	0	X	0	0	1.78E-02 ca**
Benzenethiol	108-98-5	No	Yes	-		0	P	-	0	6.62E-02 nc
Benzidine	92-87-5	Yes	No	230	I	0	I	0	0	7.75E-06 ca
Benzo(j)fluoranthene	205-82-3	No	No	1	C	-		0	-	1.49E-03 ca
Benzo[a]pyrene	50-32-8	Yes	No	1	I	0	I	0	0	1.78E-03 ca*
Benzo[b]fluoranthene	205-99-2	Yes	No	0	E	-		0	-	1.78E-02 ca
Benzo[k]fluoranthene	207-08-9	Yes	No	0	E	-		0	-	1.78E-01 ca
Benzoic Acid	65-85-0	No	No	-		4	I	-	265	2.65E+02 nc
Benzotrichloride	98-07-7	No	Yes	13	I	-		0	-	1.37E-04 ca
Benzyl Alcohol	100-51-6	No	No	-		0	P	-	7	6.62E+00 nc
Benzyl Chloride	100-44-7	No	Yes	0	I	0	P	0	0	1.05E-02 ca*
Beryllium and compounds	7440-41-7	No	No	-		0	I	-	0	1.32E-01 nc
Bifenox	42576-02-3	No	No	-		0	P	-	1	5.96E-01 nc
Biphenthrin	82657-04-3	No	No	-		0	I	-	1	9.93E-01 nc
Biphenyl, 1,1'-	92-52-4	No	Yes	0	I	1	I	0	33	2.23E-01 ca
Bis(2-chloro-1-methylethyl) ether	108-60-1	No	Yes	-		0	I	-	3	2.65E+00 nc
Bis(2-chloroethoxy)methane	111-91-1	No	No	-		0	P	-	0	1.99E-01 nc
Bis(2-chloroethyl)ether	111-44-4	No	Yes	1	I	-		0	-	1.62E-03 ca
Bis(2-ethylhexyl)phthalate	117-81-7	No	No	0	I	0	I	0	1	1.27E-01 ca*

Bis(chloromethyl)ether	542-88-1	No	Yes	220	I	-		0	-	8.11E-06 ca
Bisphenol A	80-05-7	No	No	-		0	I	-	3	3.31E+00 nc
Boron And Borates Only	7440-42-8	No	No	-		0	I	-	13	1.32E+01 nc
Boron Trichloride	10294-34-5	No	Yes	-		2	P	-	132	1.32E+02 nc
Boron Trifluoride	7637-07-2	No	Yes	-		0	C	-	3	2.65E+00 nc
Bromate	15541-45-4	No	No	1	I	0	I	0	0	2.55E-03 ca
Bromo-2-chloroethane, 1-	107-04-0	No	Yes	2	X	-		0	-	8.92E-04 ca
Bromo-3-fluorobenzene, 1-	1073-06-9	No	Yes	-		0	X	-	0	1.99E-02 nc
Bromo-4-fluorobenzene, 1-	460-00-4	No	Yes	-		0	X	-	0	1.99E-02 nc
Bromobenzene	108-86-1	No	Yes	-		0	I	-	1	5.30E-01 nc
Bromochloromethane	74-97-5	No	Yes	-		-		-	-	
Bromodichloromethane	75-27-4	No	Yes	0	I	0	I	0	1	2.88E-02 ca*
Bromoform	75-25-2	No	Yes	0	I	0	I	0	1	2.26E-01 ca**
Bromomethane	74-83-9	No	Yes	-		0	I	-	0	9.27E-02 nc
Bromophos	2104-96-3	No	Yes	-		0	H	-	0	3.31E-01 nc
Bromopropane, 1-	106-94-5	No	Yes	-		-		-	-	
Bromoxynil	1689-84-5	No	No	0	O	0	O	0	1	1.73E-02 ca*
Bromoxynil Octanoate	1689-99-2	No	Yes	0	O	0	O	0	1	1.73E-02 ca*
Butadiene, 1,3-	106-99-0	No	Yes	1	C	-		0	-	2.97E-03 ca
Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6	No	No	-		0	O	-	2	1.99E+00 nc
Butanol, N-	71-36-3	No	Yes	-		0	I	-	7	6.62E+00 nc
Butyl Benzyl Phthalate	85-68-7	No	No	0	P	0	I	1	13	9.38E-01 ca*
Butyl Formate, tert-	762-75-4	No	Yes	-		-		-	-	
Butyl alcohol, sec-	78-92-2	No	Yes	-		2	P	-	132	1.32E+02 nc
Butylate	2008-41-5	No	Yes	-		0	I	-	3	3.31E+00 nc
Butylated hydroxyanisole	25013-16-5	No	No	0	C	-		9	-	8.92E+00 ca
Butylated hydroxytoluene	128-37-0	No	No	0	P	0	P	0	20	4.95E-01 ca*
Butylbenzene, n-	104-51-8	No	Yes	-		0	P	-	3	3.31E+00 nc
Butylbenzene, sec-	135-98-8	No	Yes	-		0	X	-	7	6.62E+00 nc
Butylbenzene, tert-	98-06-6	No	Yes	-		0	X	-	7	6.62E+00 nc
Butylphthalyl Butylglycolate	85-70-1	No	No	-		1	I	-	66	6.62E+01 nc
Cacodylic Acid	75-60-5	No	No	-		0	A	-	1	1.32E+00 nc
Cadmium (Diet)	7440-43-9	No	No	-		0	I	-	0	6.62E-02 nc
Calcium Cyanide	592-01-8	No	No	-		0	I	-	0	6.62E-02 nc
Calcium pyrophosphate	7790-76-3	No	No	-		49	P	-	3220	3.22E+03 nc
Caprolactam	105-60-2	No	No	-		1	I	-	33	3.31E+01 nc
Captafol	2425-06-1	No	No	0	C	0	I	0	0	1.19E-02 ca*
Captan	133-06-2	No	No	0	C	0	I	1	9	7.75E-01 ca*
Carbaryl	63-25-2	No	No	-		0	I	-	7	6.62E+00 nc
Carbofuran	1563-66-2	No	No	-		0	I	-	0	3.31E-01 nc
Carbon Disulfide	75-15-0	No	Yes	-		0	I	-	7	6.62E+00 nc
Carbon Tetrachloride	56-23-5	No	Yes	0	I	0	I	0	0	2.55E-02 ca*
Carbonyl Sulfide	463-58-1	No	Yes	-		-		-	-	
Carbosulfan	55285-14-8	No	No	-		0	I	-	1	6.62E-01 nc
Carboxin	5234-68-4	No	No	-		0	I	-	7	6.62E+00 nc
Ceric oxide	1306-38-3	No	No	-		-		-	-	
Chloral	75-87-6	No	Yes	-		-		-	-	
Chloral Hydrate	302-17-0	No	Yes	-		0	I	-	7	6.62E+00 nc
Chloramben	133-90-4	No	No	-		0	I	-	1	9.93E-01 nc
Chloranil	118-75-2	No	No	0	H	-		0	-	4.42E-03 ca
Chlordane (technical mixture)	12789-03-6	No	Yes	0	I	0	I	0	0	5.09E-03 ca**
Chlordecone (Kepone)	143-50-0	No	No	10	I	0	I	0	0	1.78E-04 ca
Chlorfenvinphos	470-90-6	No	No	-		0	A	-	0	4.64E-02 nc
Chlorimuron, Ethyl-	90982-32-4	No	No	-		0	O	-	6	5.96E+00 nc
Chlorine	7782-50-5	No	Yes	-		0	I	-	7	6.62E+00 nc
Chlorine Dioxide	10049-04-4	No	Yes	-		0	I	-	2	1.99E+00 nc
Chlorite (Sodium Salt)	7758-19-2	No	No	-		0	I	-	2	1.99E+00 nc
Chloro-1,1-difluoroethane, 1-	75-68-3	No	Yes	-		-		-	-	
Chloro-1,3-butadiene, 2-	126-99-8	No	Yes	-		0	H	-	1	1.32E+00 nc
Chloro-2-methylaniline HCl, 4-	3165-93-3	No	No	0	H	-		0	-	3.88E-03 ca
Chloro-2-methylaniline, 4-	95-69-2	No	No	0	P	0	X	0	0	1.78E-02 ca*
Chloroacetaldehyde, 2-	107-20-0	No	Yes	0	X	-		0	-	6.60E-03 ca
Chloroacetophenone, 2-	532-27-4	No	No	-		-		-	-	
Chloroaniline, p-	106-47-8	No	No	0	P	0	I	0	0	8.92E-03 ca*
Chlorobenzene	108-90-7	No	Yes	-		0	I	-	1	1.32E+00 nc
Chlorobenzene sulfonic acid, p-	98-66-8	No	No	-		0	X	-	7	6.62E+00 nc
Chlorobenzilate	510-15-6	No	No	0	C	0	I	0	1	1.62E-02 ca*
Chlorobenzoic Acid, p-	74-11-3	No	No	-		0	X	-	2	1.99E+00 nc
Chlorobenzotrifluoride, 3-nitro-4-	121-17-5	No	Yes	-		-		-	-	
Chlorobenzotrifluoride, 4-	98-56-6	No	Yes	-		0	P	-	0	1.99E-01 nc
Chlorobutane, 1-	109-69-3	No	Yes	-		0	P	-	3	2.65E+00 nc
Chlorodifluoromethane	75-45-6	No	Yes	-		-		-	-	
Chloroethanol, 2-	107-07-3	No	Yes	-		0	P	-	1	1.32E+00 nc
Chloroform	67-66-3	No	Yes	0	C	0	I	0	1	5.75E-02 ca*
Chloromethane	74-87-3	No	Yes	-		-		-	-	
Chloromethyl Methyl Ether	107-30-2	No	Yes	2	C	-		0	-	7.43E-04 ca
Chloronaphthalene, Beta-	91-58-7	No	Yes	-		0	I	-	5	5.30E+00 nc
Chloronitrobenzene, o-	88-73-3	No	No	0	P	0	P	0	0	5.94E-03 ca*
Chloronitrobenzene, p-	100-00-5	No	No	0	P	0	P	0	0	2.97E-02 ca**
Chlorophenol, 2-	95-57-8	No	Yes	-		0	I	-	0	3.31E-01 nc
Chloropicrin	76-06-2	No	Yes	-		-		-	-	
Chlorothalonil	1897-45-6	No	No	0	C	0	I	0	1	1.05E-01 ca**
Chlorotoluene, o-	95-49-8	No	Yes	-		0	I	-	1	1.32E+00 nc
Chlorotoluene, p-	106-43-4	No	Yes	-		0	X	-	1	1.32E+00 nc
Chlorozotocin	54749-90-5	No	No	240	C	-		0	-	7.43E-06 ca
Chlorpropham	101-21-3	No	No	-		0	O	-	3	3.31E+00 nc
Chlorpyrifos	2921-88-2	No	No	-		0	A	-	0	6.62E-02 nc
Chlorpyrifos Methyl	5598-13-0	No	No	-		0	H	-	1	6.62E-01 nc
Chlorsulfuron	64902-72-3	No	No	-		0	O	-	3	3.31E+00 nc
Chlorthal-dimethyl	1861-32-1	No	No	-		0	I	-	1	6.62E-01 nc
Chlorthiophos	60238-56-4	No	No	-		0	H	-	0	5.30E-02 nc
Chromium(III), Insoluble Salts	16065-83-1	No	No	-		2	I	-	99	9.93E+01 nc
Chromium(VI)	18540-29-9	Yes	No	1	C	0	I	0	0	3.57E-03 ca*
Chrysene	218-01-9	Yes	No	0	E	-		2	-	1.78E+00 ca
Clofentezine	74115-24-5	No	No	-		0	I	-	1	8.61E-01 nc
Cobalt	7440-48-4	No	No	-		0	P	-	0	1.99E-02 nc
Copper	7440-50-8	No	No	-		0	H	-	3	2.65E+00 nc
Copper Cyanide	544-92-3	No	No	-		0	I	-	0	3.31E-01 nc

Cresol, m-	108-39-4	No	No	-		0	I	-	3	3.31E+00 nc
Cresol, o-	95-48-7	No	No	-		0	I	-	3	3.31E+00 nc
Cresol, p-	106-44-5	No	No	-		0	A	-	7	6.62E+00 nc
Cresol, p-chloro-m-	59-50-7	No	No	-		0	A	-	7	6.62E+00 nc
Cresols	1319-77-3	No	No	-		0	A	-	7	6.62E+00 nc
Crotonaldehyde, trans-	123-73-9	No	Yes	2	H	0	P	0	0	9.38E-04 ca*
Cumene	98-82-8	No	Yes	-		0	I	-	7	6.62E+00 nc
Cupferron	135-20-6	No	No	0	C	-		0	-	8.11E-03 ca
Cyanazine	21725-46-2	No	No	1	H	0	H	0	0	2.12E-03 ca*
Cyanide (CN-)	57-12-5	No	Yes	-		0	I	-	0	3.97E-02 nc
Cyanogen	460-19-5	No	Yes	-		0	I	-	0	6.62E-02 nc
Cyanogen Bromide	506-68-3	No	Yes	-		0	I	-	6	5.96E+00 nc
Cyanogen Chloride	506-77-4	No	Yes	-		0	I	-	3	3.31E+00 nc
Cyclohexane	110-82-7	No	Yes	-		-		-	-	
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	No	No	0	X	0	X	0	1	8.92E-02 ca*
Cyclohexanone	108-94-1	No	Yes	-		5	I	-	331	3.31E+02 nc
Cyclohexene	110-83-8	No	Yes	-		0	P	-	0	3.31E-01 nc
Cyclohexylamine	108-91-8	No	Yes	-		0	I	-	13	1.32E+01 nc
Cyclopentadiene	542-92-7	No	Yes	-		-		-	-	
Cyfluthrin	68359-37-5	No	No	-		0	I	-	2	1.66E+00 nc
Cyhalothrin	68085-85-8	No	No	-		0	O	-	0	6.62E-02 nc
Cyromazine	66215-27-8	No	No	-		1	O	-	33	3.31E+01 nc
DDD, p,p`- (DDD)	72-54-8	No	No	0	I	0	X	0	0	1.99E-03 nc
DDE, p,p'-	72-55-9	No	Yes	0	I	0	X	0	0	5.24E-03 ca**
DDT	50-29-3	No	No	0	I	0	I	0	0	5.24E-03 ca**
Dalapon	75-99-0	No	No	-		0	I	-	2	1.99E+00 nc
Daminozide	1596-84-5	No	No	0	C	0	I	0	10	9.91E-02 ca
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	No	No	0	I	0	I	3	0	4.64E-01 nc
Decane	124-18-5	No	Yes	-		-		-	-	
Demeton	8065-48-3	No	No	-		0	I	-	0	2.65E-03 nc
Di(2-ethylhexyl)adipate	103-23-1	No	No	0	I	1	I	1	40	1.49E+00 ca*
Diallate	2303-16-4	No	No	0	H	-		0	-	2.92E-02 ca
Diammonium phosphate	7783-28-0	No	No	-		49	P	-	3220	3.22E+03 nc
Diazinon	333-41-5	No	No	-		0	A	-	0	4.64E-02 nc
Dibenz[a,h]anthracene	53-70-3	Yes	No	1	E	-		0	-	1.78E-03 ca
Dibenzo(a,e)pyrene	192-65-4	No	No	12	C	-		0	-	1.49E-04 ca
Dibenzofuran	132-64-9	No	Yes	-		0	X	-	0	6.62E-02 nc
Dibenzothiophene	132-65-0	No	Yes	-		0	X	-	1	6.62E-01 nc
Dibromo-3-chloropropane, 1,2-	96-12-8	Yes	Yes	1	P	0	P	0	0	2.23E-03 ca**
Dibromobenzene, 1,3-	108-36-1	No	Yes	-		0	X	-	0	2.65E-02 nc
Dibromobenzene, 1,4-	106-37-6	No	Yes	-		0	I	-	1	6.62E-01 nc
Dibromochloromethane	124-48-1	No	Yes	0	I	0	I	0	1	2.12E-02 ca*
Dibromoethane, 1,2-	106-93-4	No	Yes	2	I	0	I	0	1	8.92E-04 ca
Dibromomethane (Methylene Bromide)	74-95-3	No	Yes	-		-		-	-	
Dibutyl Phthalate	84-74-2	No	No	-		0	I	-	7	6.62E+00 nc
Dibutyltin Compounds	NA	No	No	-		0	P	-	0	1.99E-02 nc
Dibutyltin dichloride	683-18-1	No	Yes	-		-		-	-	
Dicalcium phosphate	7757-93-9	No	No	-		49	P	-	3220	3.22E+03 nc
Dicamba	1918-00-9	No	No	-		0	I	-	2	1.99E+00 nc
Dichloro-2-butene, 1,4-	764-41-0	No	Yes	-		-		-	-	
Dichloro-2-butene, cis-1,4-	1476-11-5	No	Yes	-		-		-	-	
Dichloro-2-butene, trans-1,4-	110-57-6	No	Yes	-		-		-	-	
Dichloroacetic Acid	79-43-6	No	No	0	I	0	I	0	0	3.57E-02 ca**
Dichlorobenzene, 1,2-	95-50-1	No	Yes	-		0	I	-	6	5.96E+00 nc
Dichlorobenzene, 1,3-	541-73-1	No	Yes	-		-		-	-	
Dichlorobenzene, 1,4-	106-46-7	No	Yes	0	C	0	A	0	5	3.30E-01 ca*
Dichlorobenzidine, 3,3'-	91-94-1	No	No	0	I	-		0	-	3.96E-03 ca
Dichlorobenzophenone, 4,4'-	90-98-2	No	No	-		0	X	-	1	5.96E-01 nc
Dichlorobenzotrifluoride, 3,4-	328-84-7	No	Yes	-		-		-	-	
Dichlorodifluoromethane	75-71-8	No	Yes	-		0	I	-	13	1.32E+01 nc
Dichlorodiisopropyl ether, 2,2'-	39638-32-9	No	Yes	-		-		-	-	
Dichloroethane, 1,1-	75-34-3	No	Yes	0	C	0	P	0	13	3.13E-01 ca*
Dichloroethane, 1,2-	107-06-2	No	Yes	0	I	0	X	0	0	1.96E-02 ca*
Dichloroethylene, 1,1-	75-35-4	No	Yes	-		0	I	-	3	3.31E+00 nc
Dichloroethylene, 1,2-cis-	156-59-2	No	Yes	-		0	I	-	0	1.32E-01 nc
Dichloroethylene, 1,2-trans-	156-60-5	No	Yes	-		0	I	-	1	1.32E+00 nc
Dichlorophenol, 2,4-	120-83-2	No	No	-		0	I	-	0	1.99E-01 nc
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	No	No	-		0	I	-	1	6.62E-01 nc
Dichloropropane, 1,2-	78-87-5	No	Yes	0	P	0	P	0	3	4.82E-02 ca*
Dichloropropane, 1,3-	142-28-9	No	Yes	-		0	P	-	1	1.32E+00 nc
Dichloropropanol, 2,3-	616-23-9	No	No	-		0	I	-	0	1.99E-01 nc
Dichloropropene, 1,3-	542-75-6	No	Yes	0	I	0	I	0	2	1.78E-02 ca
Dichlorvos	62-73-7	No	No	0	I	0	I	0	0	6.15E-03 ca**
Dicrotophos	141-66-2	No	No	-		0	O	-	0	1.99E-03 nc
Dicyclopentadiene	77-73-6	No	Yes	-		0	P	-	5	5.30E+00 nc
Dieldrin	60-57-1	No	No	16	I	0	I	0	0	1.11E-04 ca*
Diethanolamine	111-42-2	No	No	-		0	P	-	0	1.32E-01 nc
Diethyl Phthalate	84-66-2	No	No	-		1	I	-	53	5.30E+01 nc
Diethyl-meta-Toluamide, N,N (DEET)	134-62-3	No	No	-		-		-	-	
Diethylene Glycol Monobutyl Ether	112-34-5	No	No	-		0	P	-	2	1.99E+00 nc
Diethylene Glycol Monoethyl Ether	111-90-0	No	No	-		0	P	-	4	3.97E+00 nc
Diethylformamide	617-84-5	No	Yes	-		0	P	-	0	6.62E-02 nc
Diethylstilbestrol	56-53-1	No	No	350	C	-		0	-	5.09E-06 ca
Difenzoquat	43222-48-6	No	No	-		0	O	-	6	5.50E+00 nc
Diflubenzuron	35367-38-5	No	No	-		0	I	-	1	1.32E+00 nc
Difluoroethane, 1,1-	75-37-6	No	Yes	-		-		-	-	
Difluoropropane, 2,2-	420-45-1	No	Yes	-		-		-	-	
Dihydrosafrole	94-58-6	No	Yes	0	C	-		0	-	4.05E-02 ca
Diisopropyl Ether	108-20-3	No	Yes	-		-		-	-	
Diisopropyl Methylphosphonate	1445-75-6	No	Yes	-		0	I	-	5	5.30E+00 nc
Dimagnesium phosphate	7782-75-4	No	No	-		49	P	-	3220	3.22E+03 nc
Dimethipin	55290-64-7	No	No	-		0	O	-	1	1.44E+00 nc
Dimethoate	60-51-5	No	No	-		0	O	-	0	1.46E-01 nc
Dimethoxybenzidine, 3,3'-	119-90-4	No	No	2	P	-		0	-	1.11E-03 ca
Dimethyl methylphosphonate	756-79-6	No	No	0	P	0	P	1	4	1.05E+00 ca**
Dimethylamino azobenzene [p-]	60-11-7	No	No	5	C	-		0	-	3.88E-04 ca
Dimethylaniline HCl, 2,4-	21436-96-4	No	No	1	H	-		0	-	3.07E-03 ca

Dimethylaniline, 2,4-	95-68-1	No	No	0	P	0	X	0	0	8.92E-03 ca*
Dimethylaniline, N,N-	121-69-7	No	Yes	0	P	0	I	0	0	6.60E-02 ca**
Dimethylbenz(a)anthracene, 7,12-	57-97-6	Yes	No	250	C	-		0	-	7.13E-06 ca
Dimethylbenzidine, 3,3'-	119-93-7	No	No	11	P	-		0	-	1.62E-04 ca
Dimethylformamide	68-12-2	No	Yes	-		0	P	-	7	6.62E+00 nc
Dimethylhydrazine, 1,1-	57-14-7	No	Yes	-		0	X	-	0	6.62E-03 nc
Dimethylhydrazine, 1,2-	540-73-8	No	Yes	550	C	-		0	-	3.24E-06 ca
Dimethylphenol, 2,4-	105-67-9	No	No	-		0	I	-	1	1.32E+00 nc
Dimethylphenol, 2,6-	576-26-1	No	No	-		0	I	-	0	3.97E-02 nc
Dimethylphenol, 3,4-	95-65-8	No	No	-		0	I	-	0	6.62E-02 nc
Dimethylphthalate	131-11-3	No	No	-		-		-	-	
Dimethylterephthalate	120-61-6	No	Yes	-		0	I	-	7	6.62E+00 nc
Dimethylvinylchloride	513-37-1	No	Yes	0	C	-		0	-	3.96E-02 ca
Dinitro-o-cresol, 4,6-	534-52-1	No	No	-		0	X	-	0	5.30E-03 nc
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	No	No	-		0	I	-	0	1.32E-01 nc
Dinitrobenzene, 1,2-	528-29-0	No	No	-		0	P	-	0	6.62E-03 nc
Dinitrobenzene, 1,3-	99-65-0	No	No	-		0	I	-	0	6.62E-03 nc
Dinitrobenzene, 1,4-	100-25-4	No	No	-		0	P	-	0	6.62E-03 nc
Dinitrophenol, 2,4-	51-28-5	No	No	-		0	I	-	0	1.32E-01 nc
Dinitrotoluene Mixture, 2,4/2,6-	NA	No	No	1	I	-		0	-	2.62E-03 ca
Dinitrotoluene, 2,4-	121-14-2	No	No	0	C	0	I	0	0	5.75E-03 ca*
Dinitrotoluene, 2,6-	606-20-2	No	No	2	P	0	X	0	0	1.19E-03 ca*
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	No	No	-		0	X	-	0	6.62E-03 nc
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	No	No	-		0	X	-	0	6.62E-03 nc
Dinitrotoluene, Technical grade	25321-14-6	No	No	0	X	0	X	0	0	3.96E-03 ca*
Dinoseb	88-85-7	No	No	-		0	I	-	0	6.62E-02 nc
Dioxane, 1,4-	123-91-1	No	Yes	0	I	0	I	0	2	1.78E-02 ca
Diphenamid	957-51-7	No	No	-		0	I	-	2	1.99E+00 nc
Diphenyl Ether	101-84-8	No	Yes	-		-		-	-	
Diphenyl Sulfone	127-63-9	No	No	-		0	X	-	0	5.30E-02 nc
Diphenylamine	122-39-4	No	No	-		0	O	-	7	6.62E+00 nc
Diphenylhydrazine, 1,2-	122-66-7	No	No	1	I	-		0	-	2.23E-03 ca
Dipotassium phosphate	7758-11-4	No	No	-		49	P	-	3220	3.22E+03 nc
Diquat	85-00-7	No	No	-		0	I	-	0	1.46E-01 nc
Direct Black 38	1937-37-7	No	No	7	C	-		0	-	2.41E-04 ca
Direct Blue 6	2602-46-2	No	No	7	C	-		0	-	2.41E-04 ca
Direct Brown 95	16071-86-6	No	No	7	C	-		0	-	2.66E-04 ca
Disodium phosphate	7558-79-4	No	No	-		49	P	-	3220	3.22E+03 nc
Disulfoton	298-04-4	No	No	-		0	I	-	0	2.65E-03 nc
Dithiane, 1,4-	505-29-3	No	Yes	-		0	I	-	1	6.62E-01 nc
Diundecyl Phthalate	3648-20-2	No	Yes	-		-		-	-	
Diuron	330-54-1	No	No	-		0	I	-	0	1.32E-01 nc
Dodine	2439-10-3	No	No	-		0	O	-	1	1.32E+00 nc
EPTC	759-94-4	No	Yes	-		0	O	-	3	3.31E+00 nc
Endosulfan	115-29-7	No	Yes	-		0	I	-	0	3.97E-01 nc
Endosulfan Sulfate	1031-07-8	No	No	-		0	P	-	0	3.97E-01 nc
Endothall	145-73-3	No	No	-		0	I	-	1	1.32E+00 nc
Endrin	72-20-8	No	No	-		0	I	-	0	1.99E-02 nc
Epichlorohydrin	106-89-8	No	Yes	0	I	0	P	0	0	1.80E-01 ca**
Epoxybutane, 1,2-	106-88-7	No	Yes	-		-		-	-	
Ethanol, 2-(2-methoxyethoxy)-	111-77-3	No	No	-		0	P	-	3	2.65E+00 nc
Ethephon	16672-87-0	No	No	-		0	I	-	0	3.31E-01 nc
Ethion	563-12-2	No	No	-		0	I	-	0	3.31E-02 nc
Ethoxyethanol Acetate, 2-	111-15-9	No	Yes	-		0	P	-	7	6.62E+00 nc
Ethoxyethanol, 2-	110-80-5	No	Yes	-		0	P	-	6	5.96E+00 nc
Ethyl Acetate	141-78-6	No	Yes	-		1	I	-	60	5.96E+01 nc
Ethyl Acrylate	140-88-5	No	Yes	-		0	P	-	0	3.31E-01 nc
Ethyl Chloride	75-00-3	No	Yes	-		-		-	-	
Ethyl Ether	60-29-7	No	Yes	-		0	I	-	13	1.32E+01 nc
Ethyl Methacrylate	97-63-2	No	Yes	-		-		-	-	
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	No	No	-		0	I	-	0	6.62E-04 nc
Ethylbenzene	100-41-4	No	Yes	0	C	0	I	0	7	1.62E-01 ca*
Ethylene Cyanohydrin	109-78-4	No	No	-		0	P	-	5	4.64E+00 nc
Ethylene Diamine	107-15-3	No	Yes	-		0	P	-	6	5.96E+00 nc
Ethylene Glycol	107-21-1	No	No	-		2	I	-	132	1.32E+02 nc
Ethylene Glycol Monobutyl Ether	111-76-2	No	No	-		0	I	-	7	6.62E+00 nc
Ethylene Oxide	75-21-8	Yes	Yes	0	C	-		0	-	5.75E-03 ca
Ethylene Thiourea	96-45-7	No	No	0	C	0	I	0	0	5.30E-03 nc
Ethyleneimine	151-56-4	No	Yes	65	C	-		0	-	2.74E-05 ca
Ethylphthalyl Ethyl Glycolate	84-72-0	No	No	-		3	I	-	199	1.99E+02 nc
Fenamiphos	22224-92-6	No	No	-		0	I	-	0	1.66E-02 nc
Fenpropathrin	39515-41-8	No	No	-		0	I	-	2	1.66E+00 nc
Fenvalerate	51630-58-1	No	No	-		0	I	-	2	1.66E+00 nc
Fluometuron	2164-17-2	No	No	-		0	I	-	1	8.61E-01 nc
Fluoranthene	206-44-0	No	No	-		0	I	-	3	2.65E+00 nc
Fluorene	86-73-7	No	Yes	-		0	I	-	3	2.65E+00 nc
Fluoride	16984-48-8	No	No	-		0	C	-	3	2.65E+00 nc
Fluorine (Soluble Fluoride)	7782-41-4	No	No	-		0	I	-	4	3.97E+00 nc
Fluorobenzene	462-06-6	No	Yes	-		-		-	-	
Fluridone	59756-60-4	No	No	-		0	I	-	5	5.30E+00 nc
Flurprimidol	56425-91-3	No	No	-		0	O	-	3	2.65E+00 nc
Flusilazole	85509-19-9	No	No	-		0	O	-	0	1.32E-01 nc
Flutolanil	66332-96-5	No	No	-		1	O	-	33	3.31E+01 nc
Fluvalinate	69409-94-5	No	No	-		0	I	-	1	6.62E-01 nc
Folpet	133-07-3	No	No	-		0	O	-	6	5.96E+00 nc
Fomesafen	72178-02-0	No	No	-		0	O	-	0	1.66E-01 nc
Fonofos	944-22-9	No	No	-		0	I	-	0	1.32E-01 nc
Formaldehyde	50-00-0	No	Yes	0	C	0	I	0	13	8.49E-02 ca
Formic Acid	64-18-6	No	Yes	-		1	P	-	60	5.96E+01 nc
Fosetyl-AL	39148-24-8	No	No	-		3	O	-	166	1.66E+02 nc
Furan	110-00-9	No	Yes	-		0	I	-	0	6.62E-02 nc
Furazolidone	67-45-8	No	No	4	H	-		0	-	4.69E-04 ca
Furfural	98-01-1	No	Yes	-		0	I	-	0	1.99E-01 nc
Furium	531-82-8	No	No	2	C	-		0	-	1.19E-03 ca
Furmecyclox	60568-05-0	No	No	0	I	-		0	-	5.94E-02 ca
Gadolinium	7440-54-2	No	No	-		-		-	-	
Glufosinate, Ammonium	77182-82-2	No	No	-		0	O	-	0	3.97E-01 nc
Glutaraldehyde	111-30-8	No	No	-		0	A	-	7	6.62E+00 nc

Glycidyl	765-34-4	No	Yes	-		0	I	-	0	2.65E-02 nc
Glyphosate	1071-83-6	No	No	-		0	I	-	7	6.62E+00 nc
Guanidine	113-00-8	No	Yes	-		0	X	-	1	6.62E-01 nc
Guanidine Chloride	50-01-1	No	No	-		0	P	-	1	1.32E+00 nc
Guanidine Nitrate	506-93-4	No	No	-		0	X	-	2	1.99E+00 nc
Haloxyfop, Methyl	69806-40-2	No	No	-		0	I	-	0	3.31E-03 nc
Heptachlor	76-44-8	No	Yes	5	I	0	I	0	0	3.96E-04 ca*
Heptachlor Epoxide	1024-57-3	No	Yes	9	I	0	I	0	0	1.96E-04 ca**
Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	No	Yes	1300	W	0	W	0	0	1.37E-06 ca**
Heptanal, n-	111-71-7	No	Yes	-		-		-	-	
Heptane, N-	142-82-5	No	Yes	-		0	X	-	0	1.99E-02 nc
Hexabromobenzene	87-82-1	No	Yes	-		0	I	-	0	1.32E-01 nc
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	No	No	-		0	I	-	0	1.32E-02 nc
Hexachlorobenzene	118-74-1	No	Yes	2	I	0	I	0	0	1.11E-03 ca*
Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	No	Yes	3900	W	0	W	0	0	4.57E-07 ca**
Hexachlorobutadiene	87-68-3	No	Yes	0	I	0	P	0	0	2.29E-02 ca**
Hexachlorocyclohexane, Alpha-	319-84-6	No	No	6	I	0	A	0	1	2.83E-04 ca
Hexachlorocyclohexane, Beta-	319-85-7	No	No	2	I	-		0	-	9.91E-04 ca
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	No	No	1	C	0	I	0	0	1.62E-03 ca*
Hexachlorocyclohexane, Technical	608-73-1	No	No	2	I	-		0	-	9.91E-04 ca
Hexachlorocyclopentadiene	77-47-4	No	Yes	-		0	I	-	0	3.97E-01 nc
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	39227-28-6	No	No	13000	W	0	W	0	0	1.37E-07 ca**
Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	No	No	6200	I	-		0	-	2.88E-07 ca
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	No	Yes	13000	W	0	W	0	0	1.37E-07 ca**
Hexachloroethane	67-72-1	No	Yes	0	I	0	I	0	0	4.46E-02 ca**
Hexachlorophene	70-30-4	No	No	-		0	I	-	0	1.99E-02 nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	No	No	0	I	0	I	0	0	2.23E-02 ca*
Hexamethylene Diisocyanate, 1,6-	822-06-0	No	Yes	-		-		-	-	
Hexamethylene diisocyanate biuret	4035-89-6	No	No	-		-		-	-	
Hexamethylene diisocyanate isocyanurate	3779-63-3	No	No	-		-		-	-	
Hexamethylphosphoramide	680-31-9	No	No	-		0	P	-	0	2.65E-02 nc
Hexane, Commercial	NA	No	Yes	-		-		-	-	
Hexane, N-	110-54-3	No	Yes	-		-		-	-	
Hexanedioic Acid	124-04-9	No	No	-		2	P	-	132	1.32E+02 nc
Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	No	Yes	0	P	0	P	0	5	1.88E-01 ca*
Hexanone, 2-	591-78-6	No	Yes	-		0	I	-	0	3.31E-01 nc
Hexazinone	51235-04-2	No	No	-		0	I	-	2	2.19E+00 nc
Hexythiazox	78587-05-0	No	No	-		0	I	-	2	1.66E+00 nc
HpCDD, 1,2,3,4,6,7,8,-	35822-46-9	No	Yes	1300	W	0	W	0	0	1.37E-06 ca**
HpCDF, 1,2,3,4,7,8,9-	55673-89-7	No	Yes	1300	W	0	W	0	0	1.37E-06 ca**
HxCDD, 1,2,3,6,7,8-	57653-85-7	No	No	13000	W	0	W	0	0	1.37E-07 ca**
HxCDD, 1,2,3,7,8,9-	19408-74-3	No	No	13000	W	0	W	0	0	1.37E-07 ca**
HxCDF, 1,2,3,6,7,8-	57117-44-9	No	Yes	13000	W	0	W	0	0	1.37E-07 ca**
HxCDF, 1,2,3,7,8,9-	72918-21-9	No	No	13000	W	0	W	0	0	1.37E-07 ca**
HxCDF, 2,3,4,6,7,8-	60851-34-5	No	No	13000	W	0	W	0	0	1.37E-07 ca**
Hydramethylnon	67485-29-4	No	No	-		0	O	-	1	1.13E+00 nc
Hydrazine	302-01-2	No	Yes	3	I	-		0	-	5.94E-04 ca
Hydrazine Sulfate	10034-93-2	No	No	3	I	-		0	-	5.94E-04 ca
Hydrogen Chloride	7647-01-0	No	Yes	-		-		-	-	
Hydrogen Cyanide	74-90-8	No	Yes	-		0	I	-	0	3.97E-02 nc
Hydrogen Fluoride	7664-39-3	No	Yes	-		0	C	-	3	2.65E+00 nc
Hydrogen Sulfide	7783-06-4	No	Yes	-		-		-	-	
Hydroquinone	123-31-9	No	No	0	P	0	P	0	3	2.97E-02 ca*
Imazalil	35554-44-0	No	No	0	O	0	O	0	0	2.92E-02 ca**
Imazaquin	81335-37-7	No	No	-		0	I	-	17	1.66E+01 nc
Imazethapyr	81335-77-5	No	No	-		3	O	-	166	1.66E+02 nc
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	No	0	E	-		0	-	1.78E-02 ca
Iodine	7553-56-2	No	No	-		0	A	-	1	6.62E-01 nc
Iprodione	36734-19-7	No	No	-		0	I	-	3	2.65E+00 nc
Iron	7439-89-6	No	No	-		1	P	-	46	4.64E+01 nc
Isobutyl Alcohol	78-83-1	No	Yes	-		0	I	-	20	1.99E+01 nc
Isophorone	78-59-1	No	No	0	I	0	I	2	13	1.88E+00 ca**
Isopropalin	33820-53-0	No	Yes	-		0	I	-	1	9.93E-01 nc
Isopropanol	67-63-0	No	Yes	-		2	P	-	132	1.32E+02 nc
Isopropyl Methyl Phosphonic Acid	1832-54-8	No	No	-		0	I	-	7	6.62E+00 nc
Isoxaben	82558-50-7	No	No	-		0	I	-	3	3.31E+00 nc
JP-4	50815-00-4	No	Yes	-		-		-	-	
JP-5	NA	No	Yes	-		-		-	-	
JP-7	NA	No	Yes	-		-		-	-	
JP-8	NA	No	Yes	-		-		-	-	
Kerosene	8008-20-6	No	Yes	-		-		-	-	
Lactofen	77501-63-4	No	No	-		0	O	-	1	5.30E-01 nc
Lactonitrile	78-97-7	No	No	-		0	X	-	0	1.32E-02 nc
Lanthanum	7439-91-0	No	No	-		0	P	-	0	3.31E-03 nc
Lanthanum Acetate Hydrate	100587-90-4	No	No	-		0	P	-	0	1.38E-03 nc
Lanthanum Chloride Heptahydrate	10025-84-0	No	No	-		0	P	-	0	1.24E-03 nc
Lanthanum Chloride, Anhydrous	10099-58-8	No	No	-		0	P	-	0	1.87E-03 nc
Lanthanum Nitrate Hexahydrate	10277-43-7	No	No	-		0	P	-	0	1.06E-03 nc
Lead Phosphate	7446-27-7	No	No	0	C	-		0	-	2.10E-01 ca
Lead acetate	301-04-2	No	No	0	C	-		0	-	8.49E-03 ca
Lead subacetate	1335-32-6	No	No	0	C	-		0	-	4.69E-02 ca
Lewisite	541-25-3	No	Yes	-		0	P	-	0	3.31E-04 nc
Linuron	330-55-2	No	No	-		0	O	-	1	5.10E-01 nc
Lithium	7439-93-2	No	No	-		0	P	-	0	1.32E-01 nc
Lithium Perchlorate	7791-03-9	No	No	-		0	I	-	0	4.64E-02 nc
Lutetium	7439-94-3	No	No	-		-		-	-	
MCPA	94-74-6	No	No	-		0	I	-	0	3.31E-02 nc
MCPB	94-81-5	No	No	-		0	O	-	0	2.91E-01 nc
MCPP	93-65-2	No	No	-		0	I	-	0	6.62E-02 nc
Malathion	121-75-5	No	No	-		0	I	-	1	1.32E+00 nc
Maleic Anhydride	108-31-6	No	No	-		0	I	-	7	6.62E+00 nc
Maleic Hydrazide	123-33-1	No	No	-		1	I	-	33	3.31E+01 nc
Malononitrile	109-77-3	No	No	-		0	P	-	0	6.62E-03 nc

Mancozeb	8018-01-7	No	No	-		0	H	-	2	1.99E+00 nc
Maneb	12427-38-2	No	No	-		0	I	-	0	3.31E-01 nc
Manganese (Diet)	7439-96-5	No	No	-		0	I	-	9	9.27E+00 nc
Mephosfolan	950-10-7	No	No	-		0	H	-	0	5.96E-03 nc
Mepiquat Chloride	24307-26-4	No	No	-		0	I	-	2	1.99E+00 nc
Mercaptobenzothiazole, 2-	149-30-4	No	No	0	P	0	P	0	0	1.62E-01 ca**
Mercuric Chloride	7487-94-7	No	No	-		0	I	-	0	1.99E-02 nc
Mercury (elemental)	7439-97-6	No	Yes	-		-		-	-	
Merphos	150-50-5	No	Yes	-		0	I	-	0	1.99E-03 nc
Merphos Oxide	78-48-8	No	No	-		0	O	-	0	6.62E-03 nc
Metalaxyl	57837-19-1	No	No	-		0	I	-	4	3.97E+00 nc
Methacrylonitrile	126-98-7	No	Yes	-		0	I	-	0	6.62E-03 nc
Methamidophos	10265-92-6	No	No	-		0	I	-	0	3.31E-03 nc
Methanol	67-56-1	No	Yes	-		2	I	-	132	1.32E+02 nc
Methidathion	950-37-8	No	No	-		0	O	-	0	9.93E-02 nc
Methomyl	16752-77-5	No	No	-		0	I	-	2	1.66E+00 nc
Methoxy-5-nitroaniline, 2-	99-59-2	No	No	0	C	-		0	-	3.64E-02 ca
Methoxychlor	72-43-5	No	No	-		0	I	-	0	3.31E-01 nc
Methoxyethanol Acetate, 2-	110-49-6	No	Yes	-		0	P	-	1	5.30E-01 nc
Methoxyethanol, 2-	109-86-4	No	Yes	-		0	P	-	0	3.31E-01 nc
Methyl Acetate	79-20-9	No	Yes	-		1	X	-	66	6.62E+01 nc
Methyl Acrylate	96-33-3	No	Yes	-		-		-	-	
Methyl Ethyl Ketone (2-Butanone)	78-93-3	No	Yes	-		1	I	-	40	3.97E+01 nc
Methyl Hydrazine	60-34-4	No	Yes	-		0	P	-	0	6.62E-02 nc
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	No	Yes	-		-		-	-	
Methyl Isocyanate	624-83-9	No	Yes	-		-		-	-	
Methyl Mercury	22967-92-6	No	No	-		0	I	-	0	6.62E-03 nc
Methyl Methacrylate	80-62-6	No	Yes	-		1	I	-	93	9.27E+01 nc
Methyl Parathion	298-00-0	No	No	-		0	I	-	0	1.66E-02 nc
Methyl Phosphonic Acid	993-13-5	No	No	-		0	X	-	4	3.97E+00 nc
Methyl Styrene (Mixed Isomers)	25013-15-4	No	Yes	-		0	H	-	0	3.97E-01 nc
Methyl methanesulfonate	66-27-3	No	No	0	C	-		0	-	1.80E-02 ca
Methyl tert-Butyl Ether (MTBE)	1634-04-4	No	Yes	0	C	-		1	-	9.91E-01 ca
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	No	No	-		0	X	-	0	1.99E-02 nc
Methyl-2-Pentanol, 4-	108-11-2	No	Yes	-		-		-	-	
Methyl-5-Nitroaniline, 2-	99-55-8	No	No	0	P	0	X	0	1	1.98E-01 ca**
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	No	No	8	C	-		0	-	2.15E-04 ca
Methylaniline Hydrochloride, 2-	636-21-5	No	No	0	C	-		0	-	1.37E-02 ca
Methylarsonic acid	124-58-3	No	No	-		0	A	-	1	6.62E-01 nc
Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	No	No	-		0	X	-	0	1.32E-02 nc
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	No	No	0	X	0	X	0	0	1.78E-02 ca**
Methylcholanthrene, 3-	56-49-5	Yes	No	22	C	-		0	-	8.11E-05 ca
Methylcyclopentane	96-37-7	No	Yes	-		-		-	-	
Methylene Chloride	75-09-2	Yes	Yes	0	I	0	I	1	0	3.97E-01 nc
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	Yes	No	0	P	0	P	0	0	1.78E-02 ca**
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	No	No	0	I	-		0	-	3.88E-02 ca
Methylenebisbenzenamine, 4,4'-	101-77-9	No	No	2	C	-		0	-	1.11E-03 ca
Methylenediphenyl Diisocyanate	101-68-8	No	No	-		-		-	-	
Methylnaphthalene, 1-	90-12-0	No	Yes	0	P	0	A	0	5	6.15E-02 ca*
Methylnaphthalene, 2-	91-57-6	No	Yes	-		0	I	-	0	2.65E-01 nc
Methylstyrene, Alpha-	98-83-9	No	Yes	-		0	H	-	5	4.64E+00 nc
Metolachlor	51218-45-2	No	No	-		0	I	-	10	9.93E+00 nc
Metribuzin	21087-64-9	No	No	-		0	I	-	2	1.66E+00 nc
Metsulfuron-methyl	74223-64-6	No	No	-		0	I	-	17	1.66E+01 nc
Mineral oils	8012-95-1	No	Yes	-		3	P	-	199	1.99E+02 nc
Mirex	2385-85-5	No	Yes	18	C	0	I	0	0	9.91E-05 ca
Molinate	2212-67-1	No	No	-		0	I	-	0	1.32E-01 nc
Molybdenum	7439-98-7	No	No	-		0	I	-	0	3.31E-01 nc
Monoaluminum phosphate	13530-50-2	No	No	-		49	P	-	3220	3.22E+03 nc
Monoammonium phosphate	7722-76-1	No	No	-		49	P	-	3220	3.22E+03 nc
Monobutyltin Compounds	NA	No	No	-		-		-	-	
Monocalcium phosphate	7758-23-8	No	No	-		49	P	-	3220	3.22E+03 nc
Monochloramine	10599-90-3	No	No	-		0	I	-	7	6.62E+00 nc
Monomagnesium phosphate	7757-86-0	No	No	-		49	P	-	3220	3.22E+03 nc
Monomethylaniline	100-61-8	No	No	-		0	P	-	0	1.32E-01 nc
Monopotassium phosphate	7778-77-0	No	No	-		49	P	-	3220	3.22E+03 nc
Monosodium phosphate	7558-80-7	No	No	-		49	P	-	3220	3.22E+03 nc
Myclobutanil	88671-89-0	No	No	-		0	I	-	2	1.66E+00 nc
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	No	No	-		0	X	-	0	1.99E-02 nc
Naled	300-76-5	No	Yes	-		0	I	-	0	1.32E-01 nc
Naphtha, High Flash Aromatic (HFAN)	64742-95-6	No	Yes	-		0	X	-	2	1.99E+00 nc
Naphthalene	91-20-3	No	Yes	0	C	0	I	0	1	1.49E-02 ca*
Naphthylamine, 2-	91-59-8	No	No	2	C	-		0	-	9.91E-04 ca
Napropamide	15299-99-7	No	No	-		0	O	-	8	7.95E+00 nc
Neodymium Chloride (Stable, Nonradioactive)	10024-93-8	No	No	-		-		-	-	
Nickel Acetate	373-02-4	No	No	1	C	0	C	0	1	1.96E-03 ca
Nickel Carbonate	3333-67-3	No	No	1	C	0	C	0	1	1.96E-03 ca
Nickel Carbonyl	13463-39-3	No	Yes	1	C	0	C	0	1	1.96E-03 ca
Nickel Hydroxide	12054-48-7	No	No	1	C	0	C	0	1	1.96E-03 ca
Nickel Oxide	1313-99-1	No	No	1	C	0	C	0	1	1.96E-03 ca
Nickel Refinery Dust	NA	No	No	1	C	0	C	0	1	1.96E-03 ca
Nickel Soluble Salts	7440-02-0	No	No	-		0	I	-	1	1.32E+00 nc
Nickel Subsulfide	12035-72-2	No	No	2	C	0	C	0	1	1.05E-03 ca
Nickelocene	1271-28-9	No	No	1	C	0	C	0	1	1.96E-03 ca
Nitrate (measured as nitrogen)	14797-55-8	No	No	-		2	I	-	106	1.06E+02 nc
Nitrite (measured as nitrogen)	14797-65-0	No	No	-		0	I	-	7	6.62E+00 nc
Nitroaniline, 2-	88-74-4	No	No	-		0	X	-	1	6.62E-01 nc
Nitroaniline, 3-	99-09-2	No	No	-		-		-	-	
Nitroaniline, 4-	100-01-6	No	No	0	P	0	P	0	0	8.92E-02 ca**
Nitrobenzene	98-95-3	No	Yes	-		0	I	-	0	1.32E-01 nc
Nitrocellulose	9004-70-0	No	No	-		3000	P	-	199000	1.99E+05 nc
Nitrofurantoin	67-20-9	No	No	-		0	H	-	5	4.64E+00 nc
Nitrofurazone	59-87-0	No	No	1	C	-		0	-	1.37E-03 ca
Nitroglycerin	55-63-0	No	No	0	P	0	P	0	0	6.62E-03 nc
Nitroguanidine	556-88-7	No	No	-		0	I	-	7	6.62E+00 nc
Nitromethane	75-52-5	No	Yes	-		-		-	-	
Nitrophenol, 2-	88-75-5	No	Yes	-		-		-	-	
Nitropropane, 2-	79-46-9	No	Yes	-		-		-	-	

Nitropyrene, 4-	57835-92-4	No	No	1	C	-		0	-	1.49E-03 ca
Nitroso-N-ethylurea, N-	759-73-9	Yes	No	27	C	-		0	-	6.60E-05 ca
Nitroso-N-methylurea, N-	684-93-5	Yes	No	120	C	-		0	-	1.49E-05 ca
Nitroso-di-N-butylamine, N-	924-16-3	No	Yes	5	I	-		0	-	3.30E-04 ca
Nitroso-di-N-propylamine, N-	621-64-7	No	No	7	I	-		0	-	2.55E-04 ca
Nitrosodiethanolamine, N-	1116-54-7	No	No	3	I	-		0	-	6.37E-04 ca
Nitrosodiethylamine, N-	55-18-5	Yes	No	150	I	-		0	-	1.19E-05 ca
Nitrosodimethylamine, N-	62-75-9	Yes	Yes	51	I	0	P	0	0	3.50E-05 ca*
Nitrosodiphenylamine, N-	86-30-6	No	No	0	I	-		0	-	3.64E-01 ca
Nitrosomethylethylamine, N-	10595-95-6	No	Yes	22	I	-		0	-	8.11E-05 ca
Nitrosomorpholine [N-]	59-89-2	No	No	7	C	-		0	-	2.66E-04 ca
Nitrosopiperidine [N-]	100-75-4	No	No	9	C	-		0	-	1.90E-04 ca
Nitrosopyrrolidine, N-	930-55-2	No	No	2	I	-		0	-	8.49E-04 ca
Nitrotoluene, m-	99-08-1	No	No	-		0	X	-	0	6.62E-03 nc
Nitrotoluene, o-	88-72-2	No	Yes	0	P	0	P	0	0	8.11E-03 ca**
Nitrotoluene, p-	99-99-0	No	No	0	P	0	P	0	0	1.11E-01 ca**
Nonane, n-	111-84-2	No	Yes	-		0	X	-	0	1.99E-02 nc
Norflurazon	27314-13-2	No	No	-		0	O	-	1	9.93E-01 nc
OCDD	3268-87-9	No	No	39	W	0	W	0	0	4.57E-05 ca**
OCDF	39001-02-0	No	No	39	W	0	W	0	0	4.57E-05 ca**
Octabromodiphenyl Ether	32536-52-0	No	No	-		0	I	-	0	1.99E-01 nc
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	No	No	-		0	I	-	3	3.31E+00 nc
Octamethylpyrophosphoramide	152-16-9	No	No	-		0	H	-	0	1.32E-01 nc
Octyl Phthalate, di-N-	117-84-0	No	No	-		0	P	-	1	6.62E-01 nc
Oryzalin	19044-88-3	No	No	0	O	0	O	0	9	2.29E-01 ca*
Oxadiazon	19666-30-9	No	No	-		0	I	-	0	3.31E-01 nc
Oxamyl	23135-22-0	No	No	-		0	I	-	2	1.66E+00 nc
Oxyfluorfen	42874-03-3	No	No	0	O	0	O	0	2	2.44E-02 ca*
Paclobutrazol	76738-62-0	No	No	-		0	I	-	1	8.61E-01 nc
Paraquat Dichloride	1910-42-5	No	No	-		0	I	-	0	2.98E-01 nc
Parathion	56-38-2	No	No	-		0	H	-	0	3.97E-01 nc
PeCDF, 1,2,3,7,8-	57117-41-6	No	No	3900	W	0	W	0	0	4.57E-07 ca**
PeCDF, 2,3,4,7,8-	57117-31-4	No	No	39000	W	0	W	0	0	4.57E-08 ca**
Pebulate	1114-71-2	No	Yes	-		0	H	-	3	3.31E+00 nc
Pendimethalin	40487-42-1	No	No	-		0	O	-	20	1.99E+01 nc
Pentabromodiphenyl Ether	32534-81-9	No	Yes	-		0	I	-	0	1.32E-01 nc
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	No	No	-		0	I	-	0	6.62E-03 nc
Pentachlorobenzene	608-93-5	No	Yes	-		0	I	-	0	5.30E-02 nc
Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	No	Yes	4	W	0	W	0	0	4.57E-04 ca**
Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	No	Yes	13000	W	0	W	0	0	1.37E-07 ca**
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	No	No	130000	W	0	W	0	0	1.37E-08 ca**
Pentachloroethane	76-01-7	No	Yes	0	P	-		0	-	1.98E-02 ca
Pentachloronitrobenzene	82-68-8	No	Yes	0	H	0	I	0	0	6.86E-03 ca*
Pentachlorophenol	87-86-5	No	No	0	I	0	I	0	0	4.46E-03 ca*
Pentaerythritol tetranitrate (PETN)	78-11-5	No	No	0	X	0	P	0	0	1.32E-01 nc
Pentane, n-	109-66-0	No	Yes	-		-		-	-	
Perchlorate and Perchlorate Salts	14797-73-0	No	No	-		0	I	-	0	4.64E-02 nc
Perfluorobutane sulfonic acid (PFBS)	375-73-5	No	No	-		0	P	-	1	1.32E+00 nc
Perfluorobutanesulfonate	45187-15-3	No	No	-		0	P	-	1	1.32E+00 nc
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	-		0	D	-	0	1.32E-03 nc
Perfluorooctanesulfonate	45298-90-6	No	No	-		0	D	-	0	1.32E-03 nc
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	0	D	0	D	0	0	1.32E-03 nc
Permethrin	52645-53-1	No	No	-		0	I	-	3	3.31E+00 nc
Phenacetin	62-44-2	No	No	0	C	-		1	-	8.11E-01 ca
Phenmedipham	13684-63-4	No	No	-		0	O	-	16	1.59E+01 nc
Phenol	108-95-2	No	No	-		0	I	-	20	1.99E+01 nc
Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	No	No	-		0	I	-	0	2.65E-01 nc
Phenothiazine	92-84-2	No	No	-		0	X	-	0	3.31E-02 nc
Phenyl Isothiocyanate	103-72-0	No	Yes	-		0	X	-	0	1.32E-02 nc
Phenylenediamine, m-	108-45-2	No	No	-		0	I	-	0	3.97E-01 nc
Phenylenediamine, o-	95-54-5	No	No	0	P	0	P	0	0	1.49E-02 ca*
Phenylenediamine, p-	106-50-3	No	No	-		0	X	-	0	6.62E-02 nc
Phenylmercuric Acetate	62-38-4	No	No	-		0	I	-	0	5.30E-03 nc
Phenylphenol, 2-	90-43-7	No	No	0	H	-		1	-	9.19E-01 ca
Phorate	298-02-2	No	No	-		0	H	-	0	1.32E-02 nc
Phosmet	732-11-6	No	No	-		0	I	-	1	1.32E+00 nc
Phosphine	7803-51-2	No	Yes	-		0	I	-	0	1.99E-02 nc
Phosphoric Acid	7664-38-2	No	No	-		49	P	-	3220	3.22E+03 nc
Phosphorus, White	7723-14-0	No	Yes	-		0	I	-	0	1.32E-03 nc
Phthalic Acid, P-	100-21-0	No	No	-		1	H	-	66	6.62E+01 nc
Phthalic Anhydride	85-44-9	No	No	-		2	I	-	132	1.32E+02 nc
Picloram	1918-02-1	No	No	-		0	I	-	5	4.64E+00 nc
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	No	No	-		0	X	-	0	6.62E-03 nc
Picric Acid (2,4,6-Trinitrophenol)	88-89-1	No	No	-		0	X	-	0	5.96E-02 nc
Pirimiphos, Methyl	29232-93-7	No	No	-		0	O	-	0	4.64E-03 nc
Polybrominated Biphenyls	36355-01-8	No	No	30	C	0	H	0	0	5.94E-05 ca**
Polychlorinated Biphenyls (high risk)	1336-36-3	No	Yes	2	I	-		0	-	8.92E-04 ca
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	No	No	-		-		-	-	
Polyphosphoric acid	8017-16-1	No	No	-		49	P	-	3220	3.22E+03 nc
Potassium Cyanide	151-50-8	No	No	-		0	I	-	0	1.32E-01 nc
Potassium Perchlorate	7778-74-7	No	No	-		0	I	-	0	4.64E-02 nc
Potassium Perfluorobutane Sulfonate	29420-49-3	No	No	-		0	P	-	1	1.32E+00 nc
Potassium Perfluorooctane Sulfonate	2795-39-3	No	No	-		0	D	-	0	1.32E-03 nc
Potassium Silver Cyanide	506-61-6	No	No	-		0	I	-	0	3.31E-01 nc
Potassium tripolyphosphate	13845-36-8	No	No	-		49	P	-	3220	3.22E+03 nc
Praseodymium Chloride (Stable, Nonradioactive)	10361-79-2	No	No	-		-		-	-	
Prochloraz	67747-09-5	No	No	0	I	0	I	0	1	1.19E-02 ca*
Profluralin	26399-36-0	No	Yes	-		0	H	-	0	3.97E-01 nc
Prometon	1610-18-0	No	No	-		0	I	-	1	9.93E-01 nc
Prometryn	7287-19-6	No	No	-		0	O	-	3	2.65E+00 nc
Pronamide	23950-58-5	No	No	-		0	I	-	5	4.97E+00 nc
Propachlor	1918-16-7	No	No	-		0	I	-	1	8.61E-01 nc
Propanil	709-98-8	No	No	-		0	I	-	0	3.31E-01 nc
Propargite	2312-35-8	No	No	0	O	0	O	0	3	9.29E-03 ca
Propargyl Alcohol	107-19-7	No	Yes	-		0	I	-	0	1.32E-01 nc

Propazine	139-40-2	No	No	-		0	I	-	1	1.32E+00 nc
Propham	122-42-9	No	No	-		0	I	-	1	1.32E+00 nc
Propiconazole	60207-90-1	No	No	-		0	O	-	7	6.62E+00 nc
Propionaldehyde	123-38-6	No	Yes	-		-		-	-	
Propyl benzene	103-65-1	No	Yes	-		0	X	-	7	6.62E+00 nc
Propylene	115-07-1	No	Yes	-		-		-	-	
Propylene Glycol	57-55-6	No	No	-		20	P	-	1320	1.32E+03 nc
Propylene Glycol Dinitrate	6423-43-4	No	No	-		-		-	-	
Propylene Glycol Monomethyl Ether	107-98-2	No	Yes	-		1	H	-	46	4.64E+01 nc
Propylene Oxide	75-56-9	No	Yes	0	I	-		0	-	7.43E-03 ca
Pyrene	129-00-0	No	Yes	-		0	I	-	2	1.99E+00 nc
Pyridine	110-86-1	No	Yes	-		0	I	-	0	6.62E-02 nc
Quinalphos	13593-03-8	No	No	-		0	I	-	0	3.31E-02 nc
Quinoline	91-22-5	No	No	3	I	-		0	-	5.94E-04 ca
Quizalofop-ethyl	76578-14-8	No	No	-		0	I	-	1	5.96E-01 nc
Resmethrin	10453-86-8	No	No	-		0	I	-	2	1.99E+00 nc
Ronnel	299-84-3	No	Yes	-		0	H	-	3	3.31E+00 nc
Rotenone	83-79-4	No	No	-		0	I	-	0	2.65E-01 nc
Rubidium	7440-17-7	No	No	-		-		-	-	
Rubidium Chloride	7791-11-9	No	No	-		-		-	-	
Rubidium Hydroxide	1310-82-3	No	No	-		-		-	-	
Rubidium Iodide	7790-29-6	No	No	-		-		-	-	
Safrole	94-59-7	Yes	No	0	C	-		0	-	8.11E-03 ca
Samarium Chloride (Stable, Nonradioactive)	10361-82-7	No	No	-		-		-	-	
Samarium Nitrate (Stable, Nonradioactive)	10361-83-8	No	No	-		-		-	-	
Selenious Acid	7783-00-8	No	No	-		0	I	-	0	3.31E-01 nc
Selenium	7782-49-2	No	No	-		0	I	-	0	3.31E-01 nc
Selenium Sulfide	7446-34-6	No	No	-		0	C	-	0	3.31E-01 nc
Sethoxydim	74051-80-2	No	No	-		0	O	-	9	9.27E+00 nc
Silica (crystalline, respirable)	7631-86-9	No	No	-		-		-	-	
Silver	7440-22-4	No	No	-		0	I	-	0	3.31E-01 nc
Silver Cyanide	506-64-9	No	No	-		0	I	-	7	6.62E+00 nc
Simazine	122-34-9	No	No	0	H	0	I	0	0	1.49E-02 ca*
Sodium Acifluorfen	62476-59-9	No	No	-		0	I	-	1	8.61E-01 nc
Sodium Azide	26628-22-8	No	No	-		0	I	-	0	2.65E-01 nc
Sodium Cyanide	143-33-9	No	No	-		0	I	-	0	6.62E-02 nc
Sodium Diethyldithiocarbamate	148-18-5	No	No	0	H	0	I	0	2	6.60E-03 ca
Sodium Fluoride	7681-49-4	No	No	-		0	A	-	3	3.31E+00 nc
Sodium Fluoroacetate	62-74-8	No	No	-		0	I	-	0	1.32E-03 nc
Sodium Metavanadate	13718-26-8	No	No	-		0	H	-	0	6.62E-02 nc
Sodium Perchlorate	7601-89-0	No	No	-		0	I	-	0	4.64E-02 nc
Sodium Tungstate	13472-45-2	No	No	-		0	P	-	0	5.30E-02 nc
Sodium Tungstate Dihydrate	10213-10-2	No	No	-		0	P	-	0	5.30E-02 nc
Sodium acid pyrophosphate	7758-16-9	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium aluminum phosphate (acidic)	7785-88-8	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium aluminum phosphate (anhydrous)	10279-59-1	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium aluminum phosphate (tetrahydrate)	10305-76-7	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium hexametaphosphate	10124-56-8	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium polyphosphate	68915-31-1	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium trimetaphosphate	7785-84-4	No	No	-		49	P	-	3220	3.22E+03 nc
Sodium tripolyphosphate	7758-29-4	No	No	-		49	P	-	3220	3.22E+03 nc
Stirofos (Tetrachlorovinphos)	961-11-5	No	No	0	H	0	I	0	2	7.43E-02 ca*
Strontium, Stable	7440-24-6	No	No	-		1	I	-	40	3.97E+01 nc
Strychnine	57-24-9	No	No	-		0	I	-	0	1.99E-02 nc
Styrene	100-42-5	No	Yes	-		0	I	-	13	1.32E+01 nc
Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	No	No	-		0	P	-	0	1.99E-01 nc
Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	No	No	-		0	P	-	0	1.99E-01 nc
Sulfolane	126-33-0	No	No	-		0	P	-	0	6.62E-02 nc
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	No	No	-		0	P	-	0	5.30E-02 nc
Sulfur Mustard	505-60-2	No	Yes	-		-		-	-	
Sulfur Trioxide	7446-11-9	No	Yes	-		-		-	-	
Sulfuric Acid	7664-93-9	No	No	-		-		-	-	
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	No	No	0	I	0	H	0	3	7.13E-02 ca*
TCDD, 2,3,7,8-	1746-01-6	No	Yes	130000	C	0	I	0	0	1.37E-08 ca**
TCDF, 2,3,7,8-	51207-31-9	No	Yes	13000	W	0	W	0	0	1.37E-07 ca**
TCMTB	21564-17-0	No	No	-		0	H	-	2	1.99E+00 nc
Tebuthiuron	34014-18-1	No	No	-		0	I	-	5	4.64E+00 nc
Temephos	3383-96-8	No	No	-		0	H	-	1	1.32E+00 nc
Terbacil	5902-51-2	No	No	-		0	I	-	1	8.61E-01 nc
Terbufos	13071-79-9	No	Yes	-		0	H	-	0	1.66E-03 nc
Terbutryn	886-50-0	No	No	-		0	I	-	0	6.62E-02 nc
Tert-Butyl Acetate	540-88-5	No	Yes	0	C	-		0	-	3.57E-01 ca
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	No	No	-		0	I	-	0	6.62E-03 nc
Tetrachlorobenzene, 1,2,4,5-	95-94-3	No	Yes	-		0	I	-	0	1.99E-02 nc
Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	No	No	13	W	0	W	0	0	1.37E-04 ca**
Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	No	Yes	39	W	0	W	0	0	4.57E-05 ca**
Tetrachloroethane, 1,1,1,2-	630-20-6	No	Yes	0	I	0	I	0	2	6.86E-02 ca*
Tetrachloroethane, 1,1,2,2-	79-34-5	No	Yes	0	I	0	I	0	1	8.92E-03 ca
Tetrachloroethylene	127-18-4	No	Yes	0	I	0	I	1	0	3.97E-01 nc
Tetrachlorophenol, 2,3,4,6-	58-90-2	No	No	-		0	I	-	2	1.99E+00 nc
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	No	Yes	16	X	0	X	0	0	1.11E-04 ca*
Tetraethyl Dithiopyrophosphate	3689-24-5	No	No	-		0	I	-	0	3.31E-02 nc
Tetraethyl Lead	78-00-2	No	Yes	-		0	I	-	0	6.62E-06 nc
Tetrafluoroethane, 1,1,1,2-	811-97-2	No	Yes	-		-		-	-	
Tetrahydrofuran	109-99-9	No	Yes	-		1	I	-	60	5.96E+01 nc
Tetramethylcyclohexane	30501-43-0	No	Yes	-		-		-	-	
Tetrapotassium phosphate	7320-34-5	No	No	-		49	P	-	3220	3.22E+03 nc
Tetrasodium pyrophosphate	7722-88-5	No	No	-		49	P	-	3220	3.22E+03 nc
Tetryl (Trinitrophenylmethylnitramine)	479-45-8	No	No	-		0	P	-	0	1.32E-01 nc
Thallic Oxide	1314-32-5	No	No	-		0	G	-	0	1.32E-03 nc
Thallium (I) Nitrate	10102-45-1	No	No	-		0	X	-	0	6.62E-04 nc
Thallium (Soluble Salts)	7440-28-0	No	No	-		0	X	-	0	6.62E-04 nc
Thallium Acetate	563-68-8	No	Yes	-		0	X	-	0	6.62E-04 nc
Thallium Carbonate	6533-73-9	No	Yes	-		0	X	-	0	1.32E-03 nc
Thallium Chloride	7791-12-0	No	No	-		0	X	-	0	6.62E-04 nc
Thallium Selenite	12039-52-0	No	No	-		0	G	-	0	6.62E-04 nc
Thallium Sulfate	7446-18-6	No	No	-		0	X	-	0	1.32E-03 nc

Thifensulfuron-methyl	79277-27-3	No	No	-		0	O	-	3	2.85E+00 nc
Thiobencarb	28249-77-6	No	No	-		0	I	-	1	6.62E-01 nc
Thiocyanates	NA	No	No	-		0	P	-	0	1.32E-02 nc
Thiocyanic Acid	463-56-9	No	Yes	-		0	X	-	0	1.32E-02 nc
Thiodiglycol	111-48-8	No	No	-		0	X	-	5	4.64E+00 nc
Thiofanox	39196-18-4	No	No	-		0	H	-	0	1.99E-02 nc
Thiophanate, Methyl	23564-05-8	No	No	0	O	0	O	0	2	1.54E-01 ca*
Thiram	137-26-8	No	No	-		0	O	-	1	9.93E-01 nc
Tin	7440-31-5	No	No	-		1	H	-	40	3.97E+01 nc
Titanium Tetrachloride	7550-45-0	No	Yes	-		-		-	-	
Toluene	108-88-3	No	Yes	-		0	I	-	5	5.30E+00 nc
Toluene-2,4-diisocyanate	584-84-9	No	Yes	0	C	-		0	-	4.57E-02 ca
Toluene-2,5-diamine	95-70-5	No	No	0	X	0	X	0	0	9.91E-03 ca**
Toluene-2,6-diisocyanate	91-08-7	No	Yes	0	C	-		0	-	4.57E-02 ca
Toluic Acid, p-	99-94-5	No	No	-		0	P	-	0	3.31E-01 nc
Toluidine, o- (Methylaniline, 2-)	95-53-4	No	No	0	P	-		0	-	1.11E-01 ca
Toluidine, p-	106-49-0	No	No	0	P	0	X	0	0	5.94E-02 ca**
Total Petroleum Hydrocarbons (Aliphatic High)	NA	No	Yes	-		3	P	-	199	1.99E+02 nc
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	No	Yes	-		-		-	-	
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	No	Yes	-		0	X	-	1	6.62E-01 nc
Total Petroleum Hydrocarbons (Aromatic High)	NA	No	No	-		0	P	-	3	2.65E+00 nc
Total Petroleum Hydrocarbons (Aromatic Low)	NA	No	Yes	-		0	P	-	0	2.65E-01 nc
Total Petroleum Hydrocarbons (Aromatic Medium)	NA	No	Yes	-		0	P	-	0	2.65E-01 nc
Toxaphene	8001-35-2	No	No	1	I	0	P	0	0	1.62E-03 ca**
Toxaphene, Weathered	NA	No	No	-		0	X	-	0	1.99E-03 nc
Tralomethrin	66841-25-6	No	No	-		0	I	-	0	4.97E-01 nc
Tri-n-butyltin	688-73-3	No	Yes	-		0	A	-	0	1.99E-02 nc
Triacetin	102-76-1	No	No	-		80	X	-	5300	5.30E+03 nc
Triadimefon	43121-43-3	No	No	-		0	O	-	2	2.25E+00 nc
Triallate	2303-17-5	No	Yes	0	O	0	O	0	2	2.49E-02 ca*
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	No	No	-		49	P	-	3220	3.22E+03 nc
Triasulfuron	82097-50-5	No	No	-		0	I	-	1	6.62E-01 nc
Tribenuron-methyl	101200-48-0	No	No	-		0	I	-	1	5.30E-01 nc
Tribromobenzene, 1,2,4-	615-54-3	No	Yes	-		0	I	-	0	3.31E-01 nc
Tribromophenol, 2,4,6-	118-79-6	No	No	-		0	X	-	1	5.96E-01 nc
Tributyl Phosphate	126-73-8	No	No	0	P	0	P	0	1	1.98E-01 ca**
Tributyltin Compounds	NA	No	No	-		0	P	-	0	1.99E-02 nc
Tributyltin Oxide	56-35-9	No	No	-		0	I	-	0	1.99E-02 nc
Tricalcium phosphate	7758-87-4	No	No	-		49	P	-	3220	3.22E+03 nc
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	No	Yes	-		30	I	-	1990	1.99E+03 nc
Trichloro-2'-hydroxydiphenylether	3380-34-5	No	No	-		-		-	-	
Trichloroacetic Acid	76-03-9	No	No	0	I	0	I	0	1	2.55E-02 ca*
Trichloroaniline HCl, 2,4,6-	33663-50-2	No	No	0	H	-		0	-	6.15E-02 ca
Trichloroaniline, 2,4,6-	634-93-5	No	No	0	X	0	X	0	0	1.99E-03 nc
Trichlorobenzene, 1,2,3-	87-61-6	No	Yes	-		0	X	-	0	5.30E-02 nc
Trichlorobenzene, 1,2,4-	120-82-1	No	Yes	0	P	0	I	0	1	6.15E-02 ca*
Trichloroethane, 1,1,1-	71-55-6	No	Yes	-		2	I	-	132	1.32E+02 nc
Trichloroethane, 1,1,2-	79-00-5	No	Yes	0	I	0	I	0	0	3.13E-02 ca**
Trichloroethylene	79-01-6	Yes	Yes	0	I	0	I	0	0	3.31E-02 nc
Trichlorofluoromethane	75-69-4	No	Yes	-		0	I	-	20	1.99E+01 nc
Trichlorophenol, 2,4,5-	95-95-4	No	No	-		0	I	-	7	6.62E+00 nc
Trichlorophenol, 2,4,6-	88-06-2	No	No	0	I	0	P	0	0	6.62E-02 nc
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	No	No	-		0	I	-	1	6.62E-01 nc
Trichlorophenoxypropionic acid, -2,4,5	93-72-1	No	No	-		0	I	-	1	5.30E-01 nc
Trichloropropane, 1,1,2-	598-77-6	No	Yes	-		0	I	-	0	3.31E-01 nc
Trichloropropane, 1,2,3-	96-18-4	Yes	Yes	30	I	0	I	0	0	5.94E-05 ca
Trichloropropene, 1,2,3-	96-19-5	No	Yes	-		0	X	-	0	1.99E-01 nc
Tricresyl Phosphate (TCP)	1330-78-5	No	No	-		0	A	-	1	1.32E+00 nc
Tridiphane	58138-08-2	No	No	-		0	I	-	0	1.99E-01 nc
Triethylamine	121-44-8	No	Yes	-		-		-	-	
Triethylene Glycol	112-27-6	No	No	-		2	P	-	132	1.32E+02 nc
Trifluoroethane, 1,1,1-	420-46-2	No	Yes	-		-		-	-	
Trifluralin	1582-09-8	No	Yes	0	I	0	I	0	0	2.32E-01 ca**
Trimagnesium phosphate	7757-87-1	No	No	-		49	P	-	3220	3.22E+03 nc
Trimethyl Phosphate	512-56-1	No	No	0	P	0	P	0	1	8.92E-02 ca**
Trimethylbenzene, 1,2,3-	526-73-8	No	Yes	-		0	I	-	1	6.62E-01 nc
Trimethylbenzene, 1,2,4-	95-63-6	No	Yes	-		0	I	-	1	6.62E-01 nc
Trimethylbenzene, 1,3,5-	108-67-8	No	Yes	-		0	I	-	1	6.62E-01 nc
Trimethylpentene, 2,4,4-	25167-70-8	No	Yes	-		0	X	-	1	6.62E-01 nc
Trinitrobenzene, 1,3,5-	99-35-4	No	No	-		0	I	-	2	1.99E+00 nc
Trinitrotoluene, 2,4,6-	118-96-7	No	No	0	I	0	I	0	0	3.31E-02 nc
Triphenylphosphine Oxide	791-28-6	No	No	-		0	P	-	1	1.32E+00 nc
Tripotassium phosphate	7778-53-2	No	No	-		49	P	-	3220	3.22E+03 nc
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	No	No	-		0	A	-	1	1.32E+00 nc
Tris(1-chloro-2-propyl)phosphate	13674-84-5	No	No	-		0	X	-	1	6.62E-01 nc
Tris(2,3-dibromopropyl)phosphate	126-72-7	No	Yes	2	C	-		0	-	7.75E-04 ca
Tris(2-chloroethyl)phosphate	115-96-8	No	No	0	P	0	P	0	0	8.92E-02 ca**
Tris(2-ethylhexyl)phosphate	78-42-2	No	No	0	P	0	P	1	7	5.57E-01 ca*
Trisbutoxyethyl Phosphate	78-51-3	No	No	-		-		-	-	
Trisodium phosphate	7601-54-9	No	No	-		49	P	-	3220	3.22E+03 nc
Tungsten	7440-33-7	No	No	-		0	P	-	0	5.30E-02 nc
Uranium	NA	No	No	-		0	A	-	0	1.32E-02 nc
Urethane	51-79-6	Yes	No	1	C	-		0	-	1.78E-03 ca
Vanadium Pentoxide	1314-62-1	No	No	-		0	I	-	1	5.96E-01 nc
Vanadium and Compounds	7440-62-2	No	No	-		0	G	-	0	3.34E-01 nc
Vernolate	1929-77-7	No	Yes	-		0	I	-	0	6.62E-02 nc
Vinclozolin	50471-44-8	No	No	-		0	O	-	0	7.95E-02 nc
Vinyl Acetate	108-05-4	No	Yes	-		1	H	-	66	6.62E+01 nc
Vinyl Bromide	593-60-2	No	Yes	-		-		-	-	
Vinyl Chloride	75-01-4	Yes	Yes	1	I	0	I	0	0	2.48E-03 ca*
Warfarin	81-81-2	No	No	-		0	I	-	0	1.99E-02 nc
Xylene, m-	108-38-3	No	Yes	-		0	G	-	13	1.32E+01 nc
Xylene, o-	95-47-6	No	Yes	-		0	G	-	13	1.32E+01 nc
Xylene, p-	106-42-3	No	Yes	-		0	G	-	13	1.32E+01 nc
Xylenes	1330-20-7	No	Yes	-		0	I	-	13	1.32E+01 nc
Zinc Cyanide	557-21-1	No	No	-		0	I	-	3	3.31E+00 nc
Zinc Phosphide	1314-84-7	No	No	-		0	I	-	0	1.99E-02 nc
Zinc and Compounds	7440-66-6	No	No	-		0	I	-	20	1.99E+01 nc

Zineb	12122-67-7	No	No	-		0	I	-	3	3.31E+00 nc
Zirconium	7440-67-7	No	No	-		0	X	-	0	5.30E-03 nc

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Site-specific
Resident Contaminated Fish Inputs

Variable	Resident Contaminated Fish Default Value	Form-input Value
$CF_{res\text{-}fish}$ (contaminated fish fraction) unitless	1	1
ED_{res} (exposure duration - resident) yr	26	26
EF_{res} (exposure frequency - resident) day/yr	350	350
$IRFI_{res\text{-}a}$ (fish ingestion rate - adult) mg/day	54000	125969
TR (target cancer risk) unitless	0.000001	0.000001

Weighted Average Ingestion Rate		
Child	71.2 g/day	0.230769231
Adult	142.4 g/day	0.769230769
		1
125.9692308	g/day	
125969.2308	mg/day	

Site-specific

Resident PRGs for Contaminated Fish - Secular Equilibrium

Isotope	Fish Consumption PRG TR=1.0E-06 (pCi/g)
Secular Equilibrium PRG for Ra-226	***2.20E-04***
Secular Equilibrium PRG for Ra-228	***4.71E-04***
Secular Equilibrium PRG for Th-228	***2.06E-03***
Secular Equilibrium PRG for Th-230	***2.14E-04***
Secular Equilibrium PRG for Th-232	***4.40E-04***
Secular Equilibrium PRG for U-234	***2.09E-04***
Secular Equilibrium PRG for U-235	***8.93E-04***
Secular Equilibrium PRG for U-238	***2.03E-04***

Site-specific
Resident Individual Contribution PRGs for Contaminated Fish - Secular Equilibrium

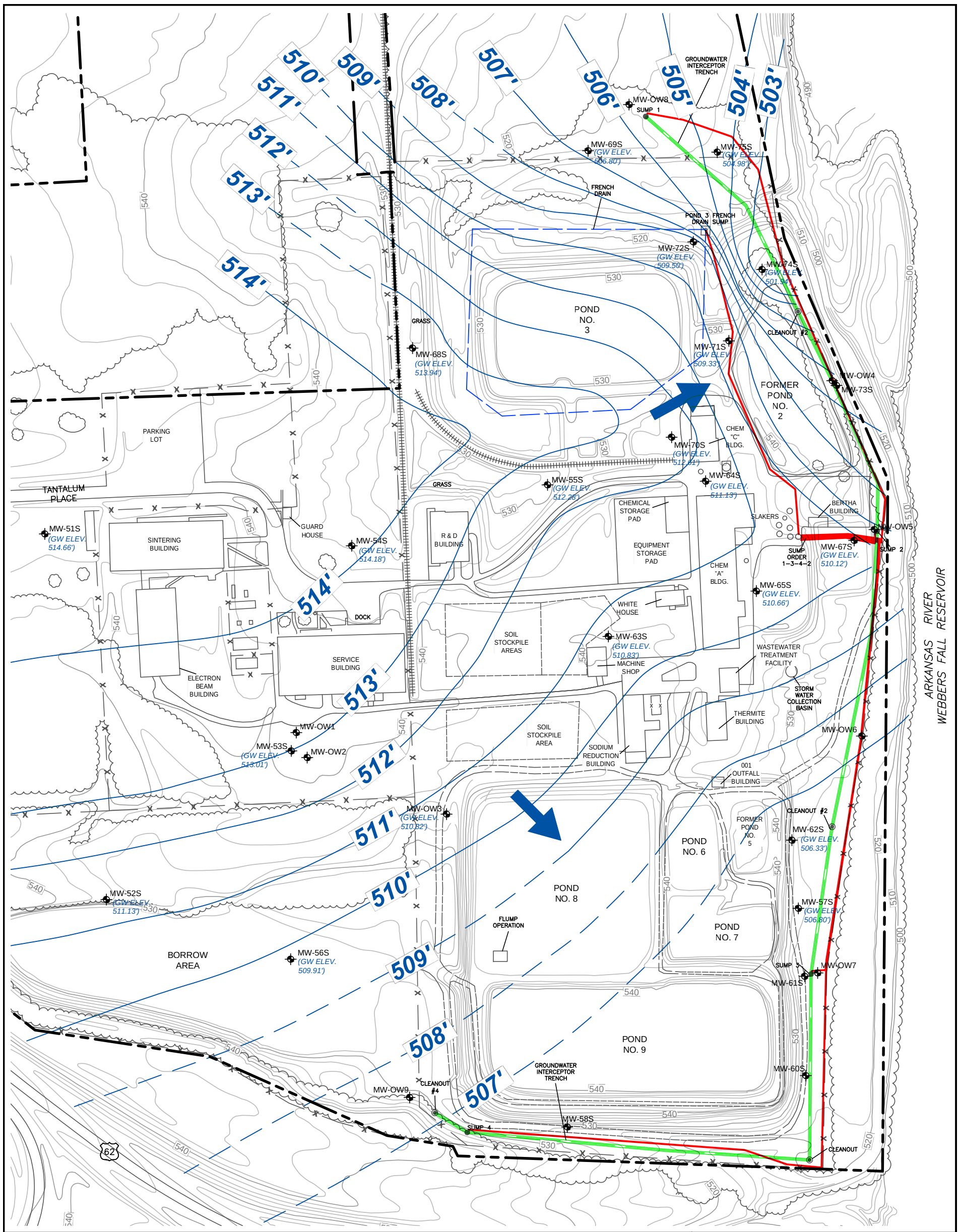
Isotope	Parent	Fractional Contribution of Progeny	Food Ingestion Slope Factor (risk/pCi)	Fish Consumption PRG TR=1.0E-06 (pCi/g)	Fish Consumption PRG TR=1.0E-06 (mg/kg)
Secular Equilibrium PRG for Ra-226	***Ra-226***	**-**	**-**	***2.20E-04***	**-**
At-218	Ra-226	2.00E-04	0.00E+00	**-**	-
Bi-210	Ra-226	1.00E+00	1.30E-11	**6.70E-02**	1.21E-10
Bi-214	Ra-226	1.00E+00	2.65E-13	**3.29E+00**	6.90E-15
Hg-206	Ra-226	1.90E-08	0.00E+00	**-**	-
Pb-210	Ra-226	1.00E+00	1.18E-09	**7.41E-04**	1.76E-05
Pb-214	Ra-226	1.00E+00	4.85E-13	**1.80E+00**	1.70E-14
Po-210	Ra-226	1.00E+00	2.25E-09	**3.87E-04**	5.76E-07
Po-214	Ra-226	1.00E+00	0.00E+00	**-**	-
Po-218	Ra-226	1.00E+00	0.00E+00	**-**	-
Ra-226	Ra-226	1.00E+00	5.14E-10	**1.70E-03**	5.97E-04
Rn-218	Ra-226	2.00E-07	0.00E+00	**-**	-
Rn-222	Ra-226	1.00E+00	0.00E+00	**-**	-
Tl-206	Ra-226	1.34E-06	0.00E+00	**-**	-
Tl-210	Ra-226	2.10E-04	0.00E+00	**-**	-
Secular Equilibrium PRG for Ra-228	***Ra-228***	**-**	**-**	***4.71E-04***	**-**
Ac-228	Ra-228	1.00E+00	2.73E-12	**3.19E-01**	1.40E-12
Bi-212	Ra-228	1.00E+00	1.01E-12	**8.64E-01**	7.92E-14
Pb-212	Ra-228	1.00E+00	3.57E-11	**2.45E-02**	2.95E-11
Po-212	Ra-228	6.41E-01	0.00E+00	**-**	-
Po-216	Ra-228	1.00E+00	0.00E+00	**-**	-
Ra-224	Ra-228	1.00E+00	2.38E-10	**3.66E-03**	1.72E-09
Ra-228	Ra-228	1.00E+00	1.42E-09	**6.12E-04**	5.99E-06
Rn-220	Ra-228	1.00E+00	0.00E+00	**-**	-
Th-228	Ra-228	1.00E+00	1.48E-10	**5.89E-03**	2.07E-07
Tl-208	Ra-228	3.59E-01	0.00E+00	**-**	-
Secular Equilibrium PRG for Th-228	***Th-228***	**-**	**-**	***2.06E-03***	**-**
Bi-212	Th-228	1.00E+00	1.01E-12	**8.64E-01**	7.92E-14
Pb-212	Th-228	1.00E+00	3.57E-11	**2.45E-02**	2.95E-11
Po-212	Th-228	6.41E-01	0.00E+00	**-**	-
Po-216	Th-228	1.00E+00	0.00E+00	**-**	-
Ra-224	Th-228	1.00E+00	2.38E-10	**3.66E-03**	1.72E-09
Rn-220	Th-228	1.00E+00	0.00E+00	**-**	-
Th-228	Th-228	1.00E+00	1.48E-10	**5.89E-03**	2.07E-07
Tl-208	Th-228	3.59E-01	0.00E+00	**-**	-
Secular Equilibrium PRG for Th-230	***Th-230***	**-**	**-**	***2.14E-04***	**-**
At-218	Th-230	2.00E-04	0.00E+00	**-**	-
Bi-210	Th-230	1.00E+00	1.30E-11	**6.70E-02**	1.21E-10
Bi-214	Th-230	1.00E+00	2.65E-13	**3.29E+00**	6.90E-15
Hg-206	Th-230	1.90E-08	0.00E+00	**-**	-
Pb-210	Th-230	1.00E+00	1.18E-09	**7.41E-04**	1.76E-05
Pb-214	Th-230	1.00E+00	4.85E-13	**1.80E+00**	1.70E-14
Po-210	Th-230	1.00E+00	2.25E-09	**3.87E-04**	5.76E-07
Po-214	Th-230	1.00E+00	0.00E+00	**-**	-
Po-218	Th-230	1.00E+00	0.00E+00	**-**	-
Ra-226	Th-230	1.00E+00	5.14E-10	**1.70E-03**	5.97E-04
Rn-218	Th-230	2.00E-07	0.00E+00	**-**	-
Rn-222	Th-230	1.00E+00	0.00E+00	**-**	-
Th-230	Th-230	1.00E+00	1.19E-10	**7.32E-03**	6.63E-03

Isotope	Parent	Fractional Contribution of Progeny	Food Ingestion Slope Factor (risk/pCi)	Fish Consumption PRG TR=1.0E-06 (pCi/g)	Fish Consumption PRG TR=1.0E-06 (mg/kg)
Tl-206	Th-230	1.34E-06	0.00E+00	-	-
Tl-210	Th-230	2.10E-04	0.00E+00	-	-
Secular Equilibrium PRG for Th-232	***Th-232***	-	-	***4.40E-04***	-
Ac-228	Th-232	1.00E+00	2.73E-12	**3.19E-01**	1.40E-12
Bi-212	Th-232	1.00E+00	1.01E-12	**8.64E-01**	7.92E-14
Pb-212	Th-232	1.00E+00	3.57E-11	**2.45E-02**	2.95E-11
Po-212	Th-232	6.41E-01	0.00E+00	-	-
Po-216	Th-232	1.00E+00	0.00E+00	-	-
Ra-224	Th-232	1.00E+00	2.38E-10	**3.66E-03**	1.72E-09
Ra-228	Th-232	1.00E+00	1.42E-09	**6.12E-04**	5.99E-06
Rn-220	Th-232	1.00E+00	0.00E+00	-	-
Th-228	Th-232	1.00E+00	1.48E-10	**5.89E-03**	2.07E-07
Th-232	Th-232	1.00E+00	1.33E-10	**6.55E-03**	1.39E+03
Tl-208	Th-232	3.59E-01	0.00E+00	-	-
Secular Equilibrium PRG for U-234	***U-234***	-	-	***2.09E-04***	-
At-218	U-234	2.00E-04	0.00E+00	-	-
Bi-210	U-234	1.00E+00	1.30E-11	**6.70E-02**	1.21E-10
Bi-214	U-234	1.00E+00	2.65E-13	**3.29E+00**	6.90E-15
Hg-206	U-234	1.90E-08	0.00E+00	-	-
Pb-210	U-234	1.00E+00	1.18E-09	**7.41E-04**	1.76E-05
Pb-214	U-234	1.00E+00	4.85E-13	**1.80E+00**	1.70E-14
Po-210	U-234	1.00E+00	2.25E-09	**3.87E-04**	5.76E-07
Po-214	U-234	1.00E+00	0.00E+00	-	-
Po-218	U-234	1.00E+00	0.00E+00	-	-
Ra-226	U-234	1.00E+00	5.14E-10	**1.70E-03**	5.97E-04
Rn-218	U-234	2.00E-07	0.00E+00	-	-
Rn-222	U-234	1.00E+00	0.00E+00	-	-
Th-230	U-234	1.00E+00	1.19E-10	**7.32E-03**	6.63E-03
Tl-206	U-234	1.34E-06	0.00E+00	-	-
Tl-210	U-234	2.10E-04	0.00E+00	-	-
U-234	U-234	1.00E+00	9.55E-11	**9.14E-03**	1.76E-02
Secular Equilibrium PRG for U-235	***U-235***	-	-	***8.93E-04***	-
Ac-227	U-235	1.00E+00	2.45E-10	**3.56E-03**	3.89E-06
At-219	U-235	8.28E-07	0.00E+00	-	-
Bi-211	U-235	1.00E+00	0.00E+00	-	-
Bi-215	U-235	8.03E-07	0.00E+00	-	-
Fr-223	U-235	1.38E-02	1.01E-11	**6.26E+00**	4.18E-15
Pa-231	U-235	1.00E+00	2.26E-10	**3.87E-03**	5.48E-03
Pb-211	U-235	1.00E+00	5.81E-13	**1.50E+00**	2.70E-14
Po-211	U-235	2.76E-03	0.00E+00	-	-
Po-215	U-235	1.00E+00	0.00E+00	-	-
Ra-223	U-235	1.00E+00	3.39E-10	**2.58E-03**	7.59E-09
Rn-219	U-235	1.00E+00	0.00E+00	-	-
Th-227	U-235	9.86E-01	7.03E-11	**1.26E-02**	2.59E-09
Th-231	U-235	1.00E+00	3.22E-12	**2.71E-01**	6.95E-12
Tl-207	U-235	9.97E-01	0.00E+00	-	-
U-235	U-235	1.00E+00	9.44E-11	**9.25E-03**	5.01E+01
Secular Equilibrium PRG for U-238	***U-238***	-	-	***2.03E-04***	-
At-218	U-238	2.00E-04	0.00E+00	-	-
Bi-210	U-238	1.00E+00	1.30E-11	**6.70E-02**	1.21E-10
Bi-214	U-238	1.00E+00	2.65E-13	**3.29E+00**	6.90E-15
Hg-206	U-238	1.90E-08	0.00E+00	-	-

Isotope	Parent	Fractional Contribution of Progeny	Food Ingestion Slope Factor (risk/pCi)	Fish Consumption PRG TR=1.0E-06 (pCi/g)	Fish Consumption PRG TR=1.0E-06 (mg/kg)
Pa-234	U-238	1.60E-03	3.00E-12	**1.82E+02**	2.76E-15
Pa-234m	U-238	1.00E+00	0.00E+00	**-**	-
Pb-210	U-238	1.00E+00	1.18E-09	**7.41E-04**	1.76E-05
Pb-214	U-238	1.00E+00	4.85E-13	**1.80E+00**	1.70E-14
Po-210	U-238	1.00E+00	2.25E-09	**3.87E-04**	5.76E-07
Po-214	U-238	1.00E+00	0.00E+00	**-**	-
Po-218	U-238	1.00E+00	0.00E+00	**-**	-
Ra-226	U-238	1.00E+00	5.14E-10	**1.70E-03**	5.97E-04
Rn-218	U-238	2.00E-07	0.00E+00	**-**	-
Rn-222	U-238	1.00E+00	0.00E+00	**-**	-
Th-230	U-238	1.00E+00	1.19E-10	**7.32E-03**	6.63E-03
Th-234	U-238	1.00E+00	3.39E-11	**2.57E-02**	1.68E-09
Tl-206	U-238	1.34E-06	0.00E+00	**-**	-
Tl-210	U-238	2.10E-04	0.00E+00	**-**	-
U-234	U-238	1.00E+00	9.55E-11	**9.14E-03**	1.76E-02
U-238	U-238	1.00E+00	8.66E-11	**1.01E-02**	2.96E+02

ATTACHMENT E

GROUNDWATER POTENTIOMETRIC CONTOUR SURFACE MAP



LEGEND

- PROPERTY LINE
- BUILDING
- FENCE
- SOIL STOCKPILE AREA
- GROUNDWATER CONTOUR (IN FEET AMSL)
- GROUNDWATER INTERCEPTOR TRENCH
- CLEANOUT
- SUMP
- PAVED ROAD
- UNPAVED ROAD
- RAILROAD
- TREELINE
- MW56S MONITORING WELL
- MW-OW3 OBSERVATION WELL
- SUMP DRAINAGE LINE
- FRENCH DRAIN
- GROUNDWATER FLOW

Muskogee, OK

N

0 100' 200'
SCALE IN FEET

NRC No.: 1188881
TDD No.: 0004/17-077

MAJOR TOPOGRAPHIC CONTOUR INTERVAL = 10 FT
MINOR TOPOGRAPHIC CONTOUR INTERVAL = 2 FT

C:\FANSTEEL.DWG Dec 03, 2020 – 4:35pm

US EPA REGION 6

ATTACHMENT E
GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAP
APRIL 2019

FANSTEEL METALS/FMRI, INC.
10 TANTALUM PLACE
MUSKOGEE, OKLAHOMA

DATE:	W.O. #	SCALE:
JUN 2020	20600.012.001.1352.01	AS SHOWN

C:\FANSTEEL.DWG, 12/3/2020 4:35:28 PM, HERNANDD

ATTACHMENT F

CALCULATION OF GROUNDWATER FLUX TO ARKANSAS RIVER

DATE: 23 September 2020

TO: Jeffrey Criner

FROM: Dong Ding

SUBJECT: Calculation of Groundwater Flux to Arkansas River – Based on Darcy's Law

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INTRODUCTION

This technical note summarizes the calculation of groundwater flux to the Arkansas based on Darcy's Law and available data collected in the site, which is in 10 Tantalum Place, Muskogee, Oklahoma.

METHOD/EQUATIONS

This calculation is based on Darcy's law, which states that groundwater flux is a function of hydraulic gradient, hydraulic conductivity of the media, and the area of the cross-section; it can be expressed as:

$$Q = KAJ = K \cdot b \cdot w \cdot \frac{h_0 - h}{L} \qquad \text{Eq. 1}$$

where Q = groundwater flux (L^3/T)

K = hydraulic conductivity (L/T)

A = b × w = area of the cross-section perpendicular to the flow direction (L^2)

b = thickness of the rectangular cross-section (L)

w = width of the rectangular cross-section (L)

J = Δh/ΔL = hydraulic gradient (L/L)

$\Delta h = h_0 - h$ = difference of hydraulic heads from upgradient to downgradient (L)

L = distance along the flow direction from h_0 to h (L)

DATA AND CALCULATION

The data available for the calculation includes: 1) groundwater potentiometric surface contour based on data collected in April 2019; and 2) Boring logs from Borings MW-68S to MW-75S.

As the potentiometric map shows, groundwater flows from west to east in the north section (north of Sump 2) and northwest to southeast in the south section (south of Sump 2); hence flux to Arkansas river includes these two portions. In addition, the contours suggest that hydraulic gradient in the north section ranges from 0.02 to 0.067 ft/ft with the average of approximately 0.033 ft/ft, while the south section had hydraulic gradient approximately 0.0067 ft/ft.

Boring logs (tabulated below) show that sand unit is underlying a layer of silty clay in all the wells. Due to the relatively high permeability, the sand unit accounts for groundwater flux to the river. The saturated sand thickness for the 7 wells ranges from 0.3 to 16.2 ft, with the average of 6.4 ft. The average value is used in this calculation.

Hydraulic conductivity (K) for sand unit is reported in the range of 0.2 ft/day to 140 ft/day (Domenico and Schwartz 1990). These values will be used in the calculation.

Well	Ground surface (ft msl)	Well Bottom (ft)	Bottom of sand (ft)	Material	Top of Sand (ft)	Overlying Material	Thickness Sand (ft)	WL	Saturated thickness (ft)
MW-68S	527.78	26.8	26.8	Sand	21	Silty Clay	5.8	513.94	12.96
MW-69S	515.51	13.4	13.4	Sand, gravel	5.5	Clayey sand, sandy clay	7.9	506.8	4.69
MW-70S	533.45	32	30	Sand	22	Sandy clay, silty clay	8	512.61	9.16
MW-71S	526.91	24	24	Sand	9.5	Sandy clay, clayey sand	14.5	509.33	6.42
MW-72S	512.12	19.5	19.5	Sand	3.3	Sandy clay, silty clay	16.2	509.5	16.88
MW-74S	518.62	17	17	Sand	8.5	Sandy clay	8.5	501.94	0.32
MW-75S	510.81	9	9	Sand	4.5	Clayey sand	4.5	504.98	3.17

CALCULATION AND RESULTS

The table below shows the calculated flux to the Arkansas river (in the unit of cubic feet per second, cfs) and the inputs for the calculation.

Section	Hydraulic Gradient (ft/ft)	Hydraulic conductivity (ft/day)	Saturation thickness (ft)	Width of interface (ft)	Flux (cfs)
North	0.033	0.2	6.4	1120	0.0005
	0.033	140	6.4	1120	0.3833
South	0.0067	0.2	6.4	1250	0.0001
	0.0067	140	6.4	1250	0.0869

Hydraulic gradient and saturation thickness in the calculation are average values; hydraulic conductivity is from literature; and the widths of interface are measured from the potentiometric

map. The width for the south section is measured along the river instead of perpendicular to the flow lines. For the purpose of calculating flux to the river, the approximation (width measured with an angle versus. partial flux) is reasonable.

Total groundwater flux (north and south sections) to the Arkansas River within the reach shown in the Potentiometric map is calculated within the range of 0.0007 cfs to 0.47 cfs based on the K values for sand unit from literature (0.2 to 140 ft/day).

CLOUSURE

This note summarizes the calculation of groundwater flux to the Arkansas River within the reach of study area (10 Tantalum Place, Muskogee, Oklahoma). The results are sensitive to the hydraulic conductivity value of the sand unit in the site. Please feel free to reach if there is any question of the analysis.

Reference

Domenico P.A. and Schwartz F.W. 1990, Physical and Chemical Hydrogeology. John Wiley & Sons, New York, 824p.

ATTACHMENT G

WORKING FILES AND COST ESTIMATES

TOTAL CAPITAL AND O&M COST - ET COVER

Capital Cost			
Subcontrator cost (all-in cost per square yard)	$	400,322.66	
Prime contrator overhead and profit (10%)	$	40,032.27	
Subtotal	$	440,354.93	
Contingency (20%)	$	88,070.99	
Subtotal	$	528,425.91	
Project/Construction Management (14%)	$	73,979.63	
Subtotal	$	602,405.54	
Remedial Design (12%)	$	72,288.66	
Total Capital Cost	**$**	**674,694.20**	
O&M Cost (If required by NRC, ODEQ, or EPA)			
Groundwater sampling	$	5,000.00	per year
Regular maintenance	$	5,000.00	per year
Reporting	$	5,000.00	per year
Subtotal	$	15,000.00	per year
Total O&M years		30.00	years
Total O&M Cost (30 Years)	**$**	**450,000.00**	
Total Capital and O&M Costs (30 years)	**$**	**1,124,694.20**	

Assumptions:

1. Hydro seeding as a cover estimated at $20,000 not included above.

2. Existing liner will remain in place.

TOTAL CAPITAL AND O&M COST - EXPOSED LINER

Capital Cost	Cost of Liner and geocomposite under the liner		Cost of Liner only (no geocomposite under the Liner)
Subcontrator cost (60-mil HDPE + Geocomposite)	$ 71,861.88	(based on quote by GSI; added)	$ 41,176.62
Prime contrator overhead and profit (est. 10%)	$ 7,186.19		$ 7,186.19
Minor grading and site preparation	$ 18,183.85	(grading cost assuming approx. 1500 cy and $10 per cy)	$ 18,183.85
Cost of Liner QA/QC	$ 30,000.00	(engineers estimate)	$ 30,000.00
Cost of Anchoring	$ 7,600.00	(assuming $10 per liner foot)	$ 7,600.00
Subtotal	$ 134,831.92		$ 48,362.81
Contingency (20%)	$ 26,966.38		$ 9,672.56
Subtotal	$ 161,798.30		$ 58,035.37
Project/Construction Management (25%)	$ 40,449.58		$ 14,508.84
Subtotal	$ 202,247.88		$ 72,544.21
Remedial Design (20%)	$ 40,449.58		$ 14,508.84
Total Capital Cost	**$ 242,697.45**		**$ 87,053.06**
O&M Cost (If required by NRC, ODEQ, or EPA)			
Groundwater sampling	$ 5,000.00	per year	$ 5,000.00
Regular maintenance	$ 2,000.00	per year	$ 2,000.00
Reporting	$ 5,000.00	per year	$ 5,000.00
Subtotal	$ 12,000.00	per year	$ 12,000.00
Total O&M years	30.00	years	30.00
Total O&M Cost (30 Years)	**$ 360,000.00**		**$ 360,000.00**
Total Capital and O&M Costs (30 years)	**$ 602,697.45**		**$ 447,053.06**

Assumptions:

1. Cost presented includes materials only. Equipment cost not included.
2. Cost does not site prep such as liner anchoring .
3. Existing liner will remain in place.
4. Does not include performance testing of liner installation.
5. Drainage net (geocomposite) required for water management.

COST OF SLURRY WALL EAST AND PRB

Capital Cost

Item	Quantity	Unit	Unit Cost	Extended Cost
Slurry Wall Construction	56340	square feet	$ 15.00	$ 845,100.00
PRB Trench Backfill	100	feet	$ 500.00	$ 50,000.00
ZVI Material Cost	400000	pounds	$ 0.50	$ 200,000.00
Install and develop performance Monitoring Wel	10	EA	$ 3,600.00	$ 36,000.00
Subtotal				$ 1,131,100.00
Prime Contractor Profit and Overhead			10%	$ 113,110.00
Subtotal				$ 1,244,210.00
Contingency			20%	$ 248,842.00
Subtotal				$ 1,493,052.00
Project/Construction Management (14%)			14%	$ 209,027.28
Subtotal				$ 1,702,079.28
Remedial Design (12%)			12%	$ 204,249.51
Total Capital Cost				**$ 1,906,328.79**

O&M Cost

Groundwater sampling	$ 10,000.00	per year
Reporting	$ 5,000.00	per year
ZVI Replacement (Every 10 Years)	$ 400,000.00	Every 10 Years (doubled the material cost to account for disposal of spent media)
Total O&M years	30.00	years
Total O&M Cost (30 Years)	**$ 1,250,000.00**	
Total Capital and O&M Costs (30 years)	**$ 3,156,328.79**	

Assumptions:

1. A number of monitoring wells will be required to determine effectivenss of barrier wall and contaminant containment

2. Monitor well cost estimated at $3,000/each.

3. A number of extraction wells may be required to reduce gw pressure build up. An option to use trees to control groundwater elevation in proximity to the slurry walls can be added.

COST OF SLURRY WALL EAST AND SLURRY WALL WEST ("BATH TUB")

Capital Cost

Item	Quantity	Unit	Unit Cost	Extended Cost
Slurry Wall Construction	137200	square feet	$ 15.00	$ 2,058,000.00
Install and develop performance Monitoring Wells	20	EA	$ 3,600.00	$ 72,000.00
Subtotal				$ 2,130,000.00
Prime Contractor Profit and Overhead			20%	$ 426,000.00
Subtotal				$ 2,556,000.00
Contingency			20%	$ 511,200.00
Subtotal				$ 3,067,200.00
Project/Construction Management (11%)			11%	$ 337,392.00
Subtotal				$ 3,404,592.00
Remedial Design (8%)			8%	$ 272,367.36
Total Capital Cost				**$ 3,676,959.36**

O&M Cost

Groundwater sampling	$ 10,000.00	per year
Inspection	$ 2,000.00	per year
Reporting	$ 2,000.00	per year
Total O&M years	30.00	
Total O&M Cost (30 Years)	**$ 420,000.00**	

Total Capital and O&M Costs (30 years)	**$ 4,096,959.36**

Assumptions:

1. An option to use trees to control groundwater elevation in proximity to the slurry walls can be added.

SOIL VOLUME CALCULATION FOR SOIL STOCKPILE

-Assumes 3.5 ft uniform thickness

-Red numbers refer to volume calculated in corresponding numbers in figure to the right

-Assumes h=15 ft from ground level to top

-Assumes stockpile shape as a frustram

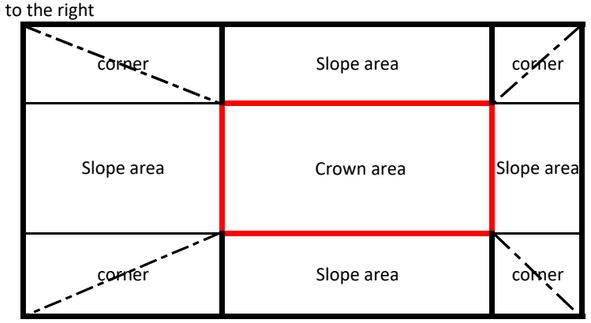
-All units in feet unless otherwise noted

Skirt area (~10 ft buffer)	1	2		
L	220	160	220	160
W	10	10	10	10
H	3	3	0.5	0.5
Sides	2	2	2	2
Volume (c. ft)	13200	9600	2200	1600
Total volume by layer (c. ft)		22800		3800
Total Skirt top volume (c. ft)				26600

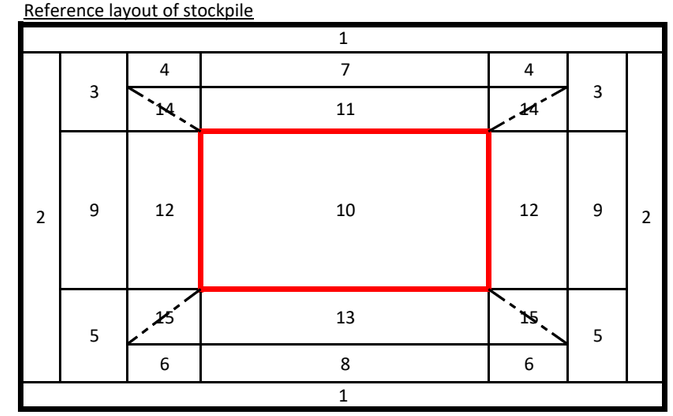
Edge area before skirt in corner area a	3	4	5	6				
L	45	20	40	10	45	20	40	10
W	15	25	15	25	15	25	15	25
H	3	3	3	3	0.5	0.5	0.5	0.5
Volume (c. ft)	2025	1500	1800	750	337.5	250	300	125
North corner adjacents		7050				1175		
South corners adjacents				5100				850
Total volume by layer (c. ft)				12150				2025
Total edge top volume (c. ft)								14175

Edge area before skirt	7	8	9			
L	120	120	75	120	120	75
W	20	10	15	20	10	15
H	3	3	3	0.5	0.5	0.5
Volume of north area (c. ft)	7200			1200		
Volume of south area (c. ft)		3600			600	
Volume of east and west (c. ft)			6750			1125
Total volume by layer (c. ft)			17550			2925
Total edge top volume (c. ft)						20475

General layout of stockpile



Reference layout of stockpile



SOIL VOLUME CALCULATION FOR SOIL STOCKPILE

General layout of stockpile

Reference layout of stockpile

Crown area	**10**	
L	120	120
W	75	75
H	3	0.5
Total volume by layer (c. ft)	27000	4500
Total Crown top volume (c. ft)		31500

Sloped areas	**11**	**12**	**13**			
L	120	75	120	120	75	120
b	33.53	33.53	29.16	33.53	33.53	29.16
h	3	3	3	0.5	0.5	0.5
Volume of north slope (c. ft)	12070.8			2011.8		
Volume of east and west slope (c. ft)		15088.5			2514.75	
Volume of south slope (c. ft)			10497.6			1749.6
Total volume by layer (c. ft)			37656.9			6276.15
Total sloped top volume (c. ft)						43933.05

Paralellogram
A=b*h
V = L*A

Center edge of corners (projecting upward volume needed)

r	3	3	3.5	3.5
h (north)	38.41		38.41	
h (south)		41.83		41.83
Volume north corners (c. ft)	543.0086		196.0864	
Volume south corners (c. ft)		591.3577		213.5458
Total volume by layer (c. ft)		1134.366		409.6323
Total edge volume (c. ft)				1543.999

Cylinder (then divide into quarter for edge volume b/w sloped blocks)
V=(pi*(r^2)*h)/4
r=3 (compacted soil)
r=3.5-3 = 0.5 (top soil)
h=length of corner slope

Corners (calculated two triangles for su	**14**	**15**
Area of north corners (sqft)	826.98	
Area of south corners (sqft)		853.706
h	3	0.5
Volume of noth corners (c. ft)	4961.88	
Volume of south corners (c. ft)		853.706
Total corner volume (c. ft)		5815.586

Semi-perimeter (S) = (a+b+c)/2
Area (Heron's formula) = sqrt(S(S-a)(S-b)(S-c))

	South corners (irregula	North corners	
a	41.03	41.83	38.41
b	3333334	29.16	33.53
c	30	25	25

	c. ft	**c. yd**
Volume of native compact soil	**123253.1**	**4564.927**
Volume of uncompacted top soil	**20789.49**	**769.9803**
Total volume of soil required	**144042.6**	**5334.907**

SURFACE AREA COVERAGE CALCULATION FOR SOIL STOCKPILE

-Assumes stockpile shape as a frustram

Skirt area (~10 ft buffer)	**1**	**2**
L	220	160
W	10	10
Sides	2	2
Area	4400	3200
Total Skirt Area (sqft)		7600

Edge area before skirt	**7**	**8**	**9**
L	120	120	25
W	20	10	15
Sides	1	1	2
Area (sqft)	2400	1200	750
Total Edge Area (sqft)			4350

Edge area before skirt in corner area and around corners	**3**	**4**	**5**	**6**
L	45	20	40	10
W	15	25	15	25
Sides	2	2	2	2
Area (sqft)	1350	1000	1200	500
Total edge area before skirt around corners (sqft)				4050

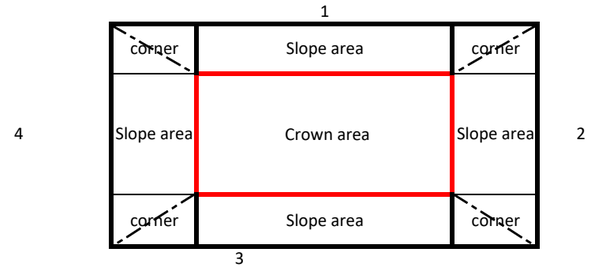
Crown area	**10**
L	120
W	75
Area (sqft)	9000
Total Crown Area (sqft)	9000

Sloped areas	**11**	**13**	**12**
L	120	120	75
W	33.53	29.16	33.53
sides	1	1	2
Area (sqft)	4023.6	3499.2	5029.5
Total Sloped Area (sqft)			12552.3

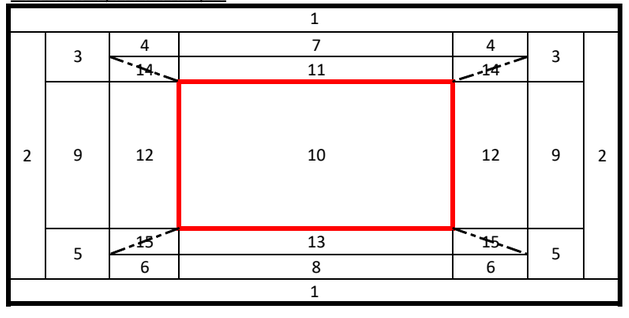
Corners (calculated two triangles for surface area and combine)	**14**	**15**
North corner area	826.98	
South corner area		853.706
Corners	2	2
Total Area for north and south, respectively (sqft)	1653.96	1707.412
Total corner area (sqft))		3361.372

	sqft	sqyd	Cap cost for ET ($/sqyd) (DOE, 20	Est. cap cost (EPA 2007)	Est. cap cost (adj. for inflation)
Total areal coverage of soil required	**40913.67**	**4545.959**	**61.78**	**280849.3476**	**400322.6601**

General layout of stockpile



Reference layout of stockpile



Company	Product	Type	Life	Unit cost (sqft)	Installation cost	Delivery Cost
Geo-synthetics	Dura-skrim (R12BV)	LLDPE	5	0.55 - 0.65	Built in with delivery	1,800
Geo-synthetics	Mircospike	HDPE		0.75 - 0.85	Built in with delivery	3,200
Geo-synthetics	Geocomposite	Geocomposite - venting		0.65-0.75	Built in with delivery	3,200
Vadose Remediation	Cetco Bentomat CLT (TR-318)	Geocomposite Clay Liner		0.9		
	SKAPS LLD-60T2 (23.5’ x 510’	LLDPE		0.33		2,300
	SKAPS HD-60T2 (23.5’ x 510’	HDPE		0.34		2,300
Solmax	40 mils Black Smooth	LLDPE				
Solmax	40 mils Premium HD	HDPE		0.25	They use ESI or GCS	
Solmax	200 mil Fabrinet	Composite - drainage		0.3233	They use ESI or GCS	

COST OF OPERATING EXISTING WWTP

O&M Cost			
Inspection	$	300,000.00	per year
Total O&M years		30.00	
Total O&M Cost (30 Years)	**$**	**9,000,000.00**	